Crafting a Place of Transition: From Refuge to Reconnection.

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Supervised by STELLA PAPANICOLOU

CONTENTS

Title and Declaration

DISSERTATION TITLE: Crafting a Place of Transition: From Refuge to Reconnection.

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Preface

To enter into the study of healing space I began the investigation from a place that is accessible to me on a personal level. The most profound period of healing I have experienced came in the form of a six day hike in the Drakensberg. By the end of it, I had fifteen blisters, but they were nothing compared to the overwhelming joy I felt. Since that experience, I have embarked on eleven more multiday hikes over the last two years. Each one is cathartic - a kind of profound mental and physical reset. To craft a place of healing and transition, I want to capture the feelings that I found on these hikes.

Figures 1 & 2

Drawings from places on the Amatola trail that felt very special.

Introduction

This design dissertation synthesizes research from a broad range of literature and modalities to form the basis for the design of an inpatient addiction treatment centre that is human-centred and cultivates a sense of refuge, a sense of community and ultimately a sense of independance.

Addiction is often shrouded in secrecy, shame and untold stories. As a result, its treatment is somewhat a mystery to anyone who has not lived or worked in a 'rehab'. To attempt to establish the meaning of it, One could start by listing what it is *not*: It is not a clinic, nor is it a hotel, nor a monestary or a prison. It is not a place of punishment, nor is it a place to lock away people who society deems inconvenient. After interviews with psychiatric professionals and site visits to existing facilities, it became clearer to me what it really is:

It is a transitional space that treats the biological, psychological, social, behavioural aspects of the deadly disease of addiction and equips individuals with the knowledge, tools, habits, connections and structure they need to look after their wellbeing independently.

This inherently threshold-like nature of the building means that it accommodates someone in two very different states: when they arrive, they are often a state of vulnerability and internal turmoil, having just hit rock bottom or had a near-death experience. When they leave, they are (ideally) ready to face the world and rebuild their lives and their connection to their family and community. This means that it needs to be a place that nurtures holds, but also acclimatizes and engages to prepare people for whatever circumstances they may face when they leave.

This paper investigates different ways that the built environment can support various aspects of this process. This space operates between contradictions and binaries - between hiding and revealing, withdrawing and engaging, protecting and challenging.

Phenomenology, Trauma-informed design and interviews with experts are used to explore how these binaries can be accommodated in architectural terms, to discover how the architecture can provide space not only for healing, but also reconnecting people to their bodies, their immediate environment, their peers and their support.

The following page contains a summary of the most important design principles that emerged from the theory and technology paper, and how they are translated into spatial and structural design of the building.

*Figures in this paper are all created by the author unless stated otherwise.

	Effects	Spatial Strategies	Structural Translations
Principle 1: Choice	Encouraging a sense of agency, autonomy and self-direction. People require different kinds of spaces to de-stress, depending on whether they exhibit the fight, flight or freeze response.	A variety of spaces with different atmospheres, made up of varying levels of privacy, enclosure, thoroughfare, sunlight and scale.	interactive elements such as moveable partitions allow people to shape the space for their own needs.
Principle 2: Cultivating a sense of Safety	A stress-free environment means people are less likely to be re-traumatized at this vulnerable time. New patients are already under a lot of internal stress and may be easily overwhelmed. A baseline level of social and sensory comfort will help people get into the right frame of mind to engage with each other and with the treatment program.	Lines of sight Explicit and implied boundaries between spaces of private and public	Thick walls to create a boundary that makes people feel safe and contained, while also creating a thermal insulator. Deep window reveals create indirect daylighting of the space, and as well as obscuring any views into the private spaces. Wide thresholds create implied boundaries and places of privacy Brickwork has familiar textures and warm colours.
Principle 3: Connection with Sunlight and Nature	Connection with nature and sunlight is healing due to the interaction of all senses with each other, and because of biophilia. Seeing the sky conditions and position of the sun helps people to feel oriented as to the time of day and weather, and helps a recovering addict to build a healthy daily routine. Exposure to sunlight regulates circadian rhythms.	Circulation is primarily outdoors. Most internal spaces have a corresponding external space into which they can spill when the weather permits. Thresholds that shelter one from sun and rain, but still connect one to a view of nature. Many comfortable outdoor areas for recreation and peace Every space has access to comfortable levels of sunlight and views of the mountains.	Barrel vaults distribute light in gentle curves in the places of refuge. Primarily using sidelighting to accommodate views. A constructed wetland filters the water and creates peaceful recreational space. Invasive wattle from the site is harvested and incorporated into the building in the form of space trusses.
Principle 4: Engaging the body and the senses	Allowing people to connect with their bodies and immediate surroundings, especially those who exhibit the 'freeze' response when they are stressed.	Building is puntuated with multiple courtyards and outdoor spaces. Sunlight is allowed into every internal space interactive elements such as moveable partitions allow people to shape the space for their own needs.	Layered facade of planting bed, honeycomb brickwork, planting and glass creates a wide barrier that diffuses light, wind and sound rather than blocking it out (As per TID principles). Combining square grids with spherical spaces to balance the need for efficient wayfinding with the need to slow down and engage with certain moments.
Principle 5: Cultivating a sense of community	Cultivating an ethos and value system within the therapeutic community can catalyse the formation of healthy habits and interpersonal connections. Helping people build lasting support networks with their peers.	Nested spaces that work between binaries of introversion and extraversion. Creating multiple spaces for formal and informal encounters and interactions.	Sail Vaults over the communal spaces bring an importance and reverence to them while also distributing light evenly over warm coloured brickwork. Nooks at the thresholds create moments for informal interactions
Principle 6: Celebrating the ordinary	Drugs and alcohol drive addicts to seek extraordinary feelings and experiences, and lose interest in the day-to-day. Celebrating spaces of 'mundane' activities such as brushing ones teeth or eating breakfast could help bring importance and attention to seemingly un-exciting daily tasks and experiences.	Domes, which are usually associated with sacred spaces, bring a reverence and importance to the communal spaces that one would usually ignore.	Using an everyday, low-cost material such as brick. Using it to manipulate sunlight, so as to create something new that is more than a sum of its parts.
Principle 7: Destigmatizing Addiction	Moving towards an inclusive culture of support, empathy and understanding, in which struggling individuals are more likely to admit when they have a problem and seek help. Spreading the ethos that addicts need help and support, rather than ostracizm.	Location the facility at a well-liked public hospital, to raise awareness about the availability of help and to frame it as a disease. Layering thresholds and spaces around the entrance to accommodate families, education and outreach, vocational training and outpatient meetings.	N/A
Principle 8: Ecologically Regenerative design	Positive reciprocal relationship with nature could deepen people's engagement with their immediate environment.	Rewilding the landscape Celebrating the wild fynbos as a centrepiece of the building.	Material connection to landscape: invasive wattle from the site is incorporated into the building in the form of space trusses, shading and 'noncrete'. A constructed wetland filters the water.

Part One: Understanding the User

- **A story in three parts: The lived experience of Catherine Gray.**

- **A story of stigma: The historical context of addiction treatment in Cape Town.**

A story in three parts

Addiction is a treatable, chronic medical disease involving complex interactions among brain circuits, genetics, the environment, and an individual's life experiences. People with addiction use substances or engage in behaviors that become compulsive and often continue despite harmful consequences."

- American Society of Addiction Medicine.

As an introduction to the primary user group, this paper begins by unpacking the story of one of the autobiographies mentioned in the prologue. Although there is no singular story of what someone in recovery goes through - nor is healing a linear process, all of the stories have commonalities, and similar stages and struggles. (Gray, 2017)

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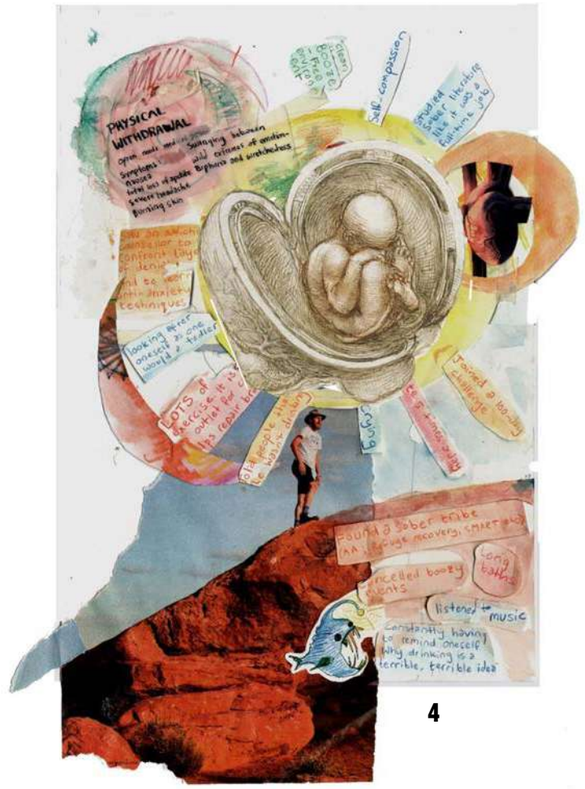
Catherine Gray starts drinking at age 12 to overcome social anxiety and fit in. It slowly and insidiously gets more and more out of control and At 25, she knows something is wrong and spends the following five years trying to control her addiction, but it progresses into physical dependence, and completed debilitating depression. At 31, she accepts that the answer is to stop drinking completely, forever.



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In part 2 of her book, she gets permanently sober through attempting it again and again until it finally sticks. The text is all the things she listed that she did to achieve this feat of Olympic proportions, and also what she experienced during withdrawal, such as wild extremes of emotion, swinging between euphoria and wretchedness, burning skin, pumping headache and screaming nerves.

Catherine Gray's sequel is a book called *Sunshine Warm Sober*. She drives home that the story doesn't end with the grueling task of getting sober, nor does it end in a place that it 'stone cold' and boring. She writes about how sobriety exceeded her wildest expectations and allowed her to finally build the life that she wanted - which in her case was travelling and experiencing the world through a new (and healthy) skin.

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Figure 6

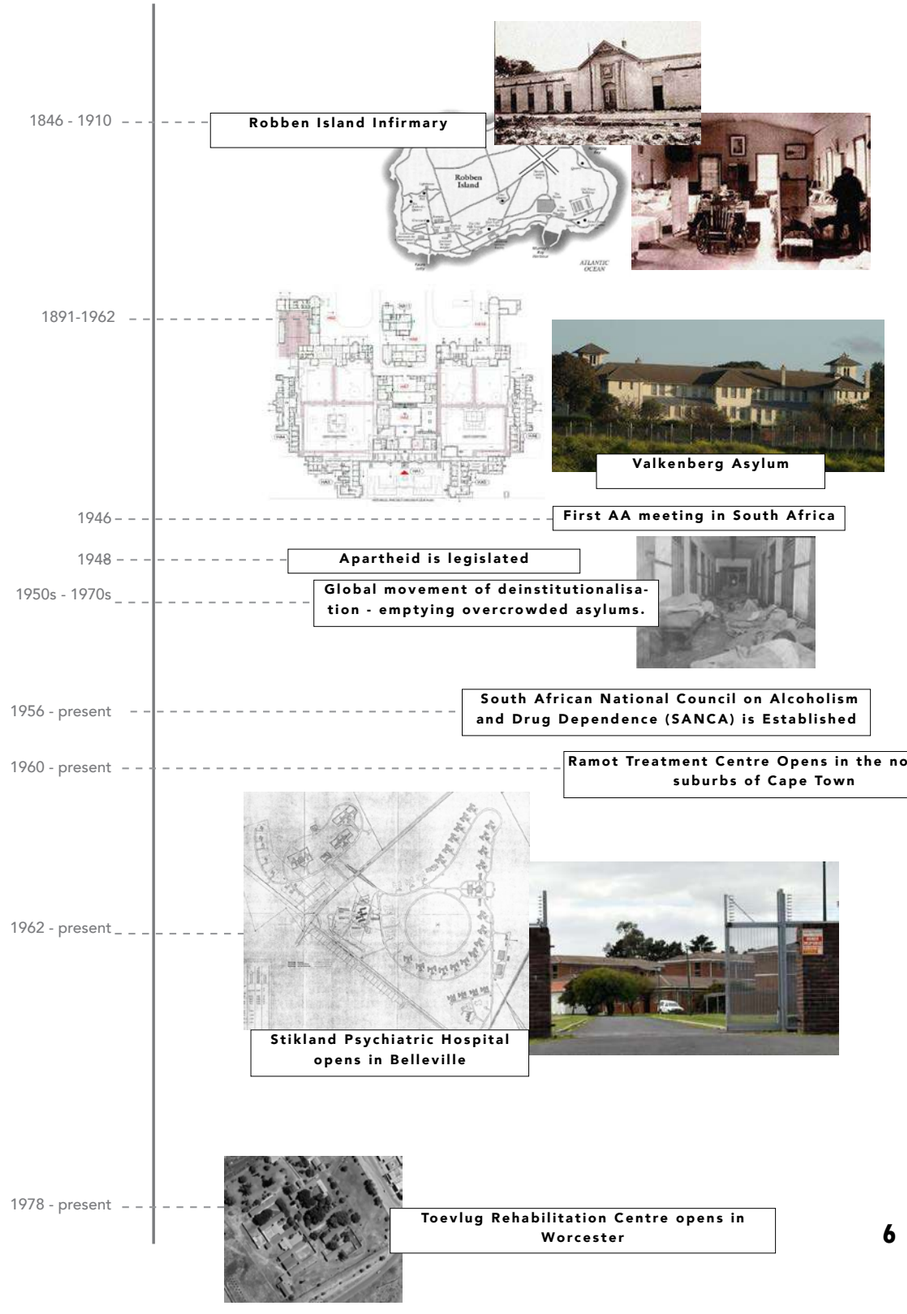
This timeline shows the chronology of the opening and closing of Cape Town's major psychiatric facilities over the last 200 years.

A story of stigma

This section provides an overview of the historical and geographic context in which the user finds themselves. This requires briefly looking at texts that examine the relationship between mental health and society on the global stage, such as Foucault's book, Madness and Society, and comparing this to texts that describe the local history within Cape Town. Paper by Makepeace and Paper by Louw shed some light on this topic.

In Foucault's book, Madness and Society, he discusses the pervasive and lasting attitude of society toward the 'other', in other words marginalized groups such as those with mental illness. He talks about how millions of lepers in Europe and forced to live in isolated colonies on the edges of cities from the Middle Ages until the 1600s, after which these Leprosaria were closed. He argues that despite the closures, a permanent mark was left in the minds of the people of these cities, and that these values of exclusion lingered on and manifested in new ways a hundred years later, when the mentally ill were incarcerated in prisons masquerading as hospitals. (Fontana-Giusti, 2013)

At this time, parallels were happening in the Cape Colony. According to Roy Makepeace's paper, the first hospital that made provisions for 'mentally deranged' persons in the Cape was in 1699. It accommodated a very narrow definition of people who could be housed there, and 'alcoholics' did not make the cut. This exclusion was becasue addiction was not yet recognised as a medical disease, and was instead thought of as a kind of moral failing. This attitude meant that alcoholics were punished by being sent to gaols and to the convict station on Robben Island. In 1846, the convict colony of Robben Island was converted into a hospital for lepers, lunatics and the chronically sick, and by 1912 there were 500 patients living in this Infirmary (Makepeace, 1969).



“The attitude that mental patients should be isolated from the community has been in vogue until very recently,” stated Makepeace in 1969, “While Robben Island exemplified this type of isolation, it was closely paralleled by the number of ‘lunatic asylums’ that were built from 1875 onwards.”

The Island Infirmary was closed in 1920 and gave way to Valkenberg - a custom-built asylum on what was then the outskirts of the city (Louw, 2019). Valkenberg was closed in the 1960s due to overcrowding and replaced by Stikland Mental Hospital in Belleville. Around this time, many parts of the world were going through the process of ‘de-institutionalization’, i.e., removing people from the overcrowded psychiatric asylums and theoretically placing them in community-based care. In reality, this did not manifest as planned, and a shocking number of mentally ill people ended up homeless or incarcerated in prisons, a condition that has not improved much in the last few decades (Louw, 2019). The public psychiatric institutions of Cape Town are once again oversubscribed, resulting in a waiting list of up to four months. (Jackman, 2014)

The attitudes described above are reflected in the architecture of these facilities. The Robben Island Infirmary and the relegation of many addicted and mentally ill individuals to the convict station is a quintessential example of the attitude of the ‘expulsion’ of the mentally ill from society (Louw, 2019).

South African constitutional court judge Edwin Cameron expresses in his article in the Daily Maverick how the global ‘War on Drugs’ has failed. He discusses how the movement to ‘wage war’ on and criminalize drug use has not done anything to solve the problem, but has instead lead to the mass-incarceration of marginalized and vulnerable goups within society. He emphasizes that evidence shows that drug-use is most effectively curbed when it is treated as a social and public health issue, and not the business of the criminal system. Like Foucault, he reminds us that substance-users are not invaders from outer space who must be kept out by police and military action - they are our friends and neighbours, who need support and help (Edwin, 2020).

“Over-use of incarceration has led to choked-full prisons as well as inhumane and degrading conditions of detention. Paradoxically, these produce an environment for gangs and drug use to flourish. We must counteract drug use with public information, education, counselling and treatment – not with the big blunt stick of the criminal law.” (Edwin, 2020)

In South Africa, it goes without saying that substance use disorder is a huge, pervasive burden on the country and its people. However, there is hope, as everyone who gets tangled up in it has the potential to escape and live a full life. However, in Cape Town there is vast inequality when it comes to access to treatment, with only 3500 people being treated every year, out of 300 000 people in need of treatment. There are a number of private addiction treatment centres in Cape Town, but they are prohibitively expensive for the majority of Capetonians who are seeking treatment. (Myers et al., 2010)

A 2010 study investigating what barriers prevent people from getting treatment. The results were: social support for abstinence (i.e. a fear of social isolation), affordability, limited awareness about where to seek help, geographic access barriers, stigma, perceived need for treatment, psychological functioning and neighbourhood environment. The ones that I believe can be partially addressed through architectural design are the stigma, limited awareness and social support for abstinence. (Myers et al., 2010)

There are currently three government in-patient treatment facilities in the Western Cape: De Novo Treatment Centre in Kraaifontein, Western Cape Youth Rehabilitation Centre in Eerste River and Kensington Treatment Centre in Maitland (Jackman, 2014), all of which are located very far away from the southern parts of Cape Town. This means that even if individuals go through with the long journey to the northern suburbs and/or Worcester, it is nearly impossible for them to return regularly for 'aftercare'. Even the outpatient treatment option, SANCA, is located in Athlone, and would require regular trips for any program they offer. Locating an addictions treatment facility in the South would benefit people from under-resourced communities such as Ocean View, Masiphumelele, Grassy Park, Red Hill, Phillippi and Mitchell's Plein, to name a few.

The architecture of addiction treatment needs to address these notions of isolation and stigma, namely by finding ways to integrate people back into their families, communities and society as part of their treatment. Although an inpatient facility needs to be closed off and have a degree of access control, there is potential to create places of welcome and community, too. The facility could be surrounded by places where there is overlap between public and private. This would include places for vocational training, outpatient treatment and places that support the family, as well as a community space for outreach, education and events.

There is also the potential for synergies with the Neighbourhood Farms NPO, which is already involved in upskilling and employing locals from the surrounding communities.

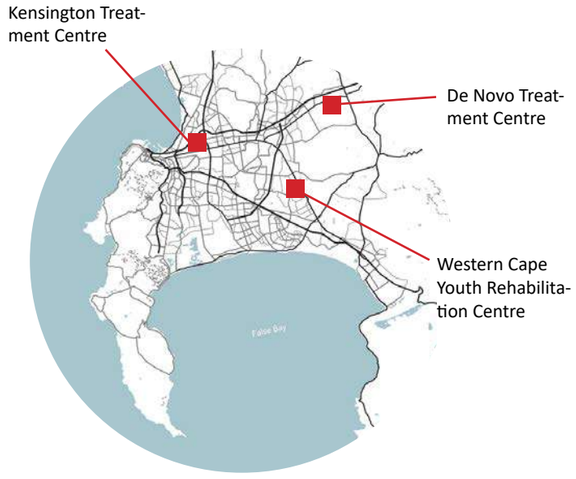


Figure 7

The three government inpatient addiction treatment facilities are geographically inaccessible to a number of areas that need them,

(Jackman, 2014)

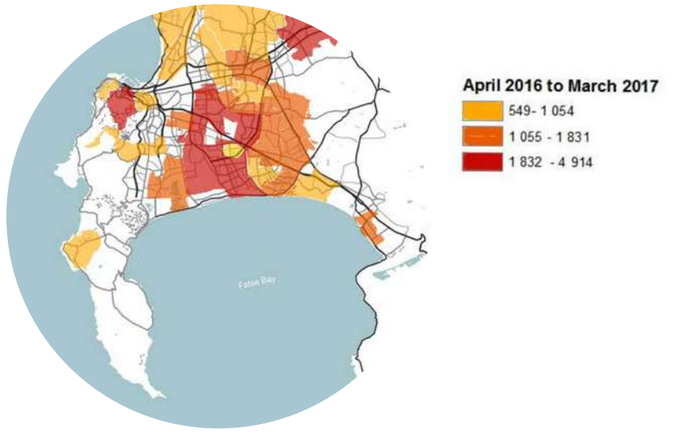


Figure 8

Number of drug-related crimes by police precinct over the course of 2019.

(Department of Community Safety, 2019)

Part Two: Introducing Theory

- **The body in the centre: Introducing the design drivers through a phenomenological lens.**
- **The Baseline: Cultivating a sense of Safety.**
- **Engaging with the building.**
- **A connection to sun and sky: Crafting with Light**

The Body at the Centre

People recovering from addiction are under a lot of stress and are facing the world anew. Before all else, they are experiencing the world through a tender new skin that is vulnerable and needs to be protected. Substance Abuse and Mental Health Services Administration (Samhsa) states that trauma is almost a universal experience of people with substance-use disorders - trauma is often the cause of an addiction, and in turn, addiction often leads to more trauma. There is also a strong link that binds addiction, anxiety, and depression – it is extremely common for them to be co-occurring disorders (Grabowska et al., 2021).

Trauma is defined as the persistent hauntings of an crisis. It a heavy stressor that works and lives in the body and overwhelms one's capacity to cope when it is triggered. The theory section of this paper will look through the lens of Pallasmaa's book *The Eyes of the Skin,* which put the body and the senses firmly at the centre of all design investigations in this paper. When thinking of the body in space in the context of addiction treatment, there is a specificity – it is a body that is in a state of healing and often in distress. It therefore becomes a priority to delve a little deeper into what kinds of spaces reduce stress, so as not to retraumatize individuals or add to their already overwhelming emotional load. Pallasmaa's writings will therefore be contextualized in the healing process by introducing theory from an emerging field called Trauma Informed Design (TID).

A Phenomenological Lens

"The eyes want to collaborate with the other senses. All the senses, including vision, can be regarded as extensions of the sense of touch – as specialisations of the skin." (Pallasmaa, 2005, p25)

In The Eyes of the Skin, Pallasmaa discusses the idea that the neglect of the senses disconnects us from our bodies. He views this as an inherent flaw in our built environment, and a direct result of the West historically privileging sight over other senses. He claims that this causes a problem because it leads to isolating the eye from its interaction with other sensual modalities, not only in prevalent thought, but in architecture too.

He argues that this is a reduction and separation that fragments the innate complexity of our perceptual system, and as a result reinforces feelings of detachment and alienation from our own bodies. He emphasizes that although the 'art of the eye' has created many thought-provoking and impressive structures, it has done nothing to facilitate the rootedness of humanity in the world.

This concept of 'human rootedness' refers to a deep and fundamental sense of connection, belonging, and orientation that individuals feel toward their surroundings, the environment, and the broader context in which they live. It encompasses both physical and psychological dimensions, emphasizing the intricate relationship between humans and the world they inhabit. This concept implies that humans are not detached observers but active participants in the world, and their well-being is intricately tied to the quality of their connection to it.

Although Pallasmaa is referring to society in general, these concepts are particularly pertinant in environments such as rehabilitation facilities, where people are re-learning how to heal and connect to their bodies, their emotions and their immediate environment.

Pallasmaa discusses how a sense of estrangement and detachment is often evoked by the most technologically advanced settings, such as airports and hospitals. Many rehabilitation centres, including the more upmarket ones, take their design cues from hospitals, as a hangover from a utilitarian age of medical care (See the timeline on page 8). For example the slippery linoleum floors, the bright fluorescent lights and smell of disinfectant. Although these qualities may be useful in settings where efficient medical procedures and machines are vital (literally), they are incredibly counter-productive in a setting where someone is supposed to psychologically heal and recover from an addiction.

Some questions that look at gaps in the current design norms of addiction treatment spaces are: How can we disrupt the highly controlled and regulated machine-centric institution of the hospital? How can the building connect people to the real reason they are there in the first place? How can it reinforce human rootedness in the world and in their own bodies?

In *The Eyes of the Skin,* Pallasmaa advocates for sensory architecture, in opposition to prevailing visual understanding of the art of building. This requires placing the body at the centre of the built environment and framing the city and architecture in terms of embodied experience. (Pallasmaa, 2005)

He also states that this privileging of sight has been exacerbated by modern technology, a claim in which he is backed up by philosophers Martin Heidegger, Michel Foucault and Jacques Derrida (Pallasmaa, 2005). When he wrote this, he was no doubt referring to the television and mass-produced media in the entertainment industry of the 20th century, but it is equally (if not more) prescient in an age where the visually oriented social media is not just replacing entertainment forms, but also replacing in-person social interactions and relationships between people and places at an exponential rate.

This idea that we should be connecting with our bodies more than we currently do has not fallen from favour or ceased to be relevant - I would argue that it has in fact come into the spotlight and taken on new, more acute forms as the problem has intensified. I am alluding to the popular interest into the de-stressing practice of 'mindfulness' – a contemporary form of Buddhist meditation that has rapidly gained traction in the mainstream and entered the daily routine of millions of very stressed and detached people in the last five years or so.

Mindfulness has been proven in a multitude of studies to be highly effective in reducing anxiety and depression (Ma, Y. & Siu, A. F., 2020). It is a practice that revolves around cultivating one's ability to focus on the present moment and observe bodily sensations and thoughts without getting caught up in them. Many of the most popular practices involve focusing attention on different senses, or the immediate environment, or on the act of breathing, or focusing on the subtle bodily sensations during a mundane task such as walking or washing the dishes, and objectively observing any thoughts and feelings as they arise and dissipate.

The moments in which it is the easiest for most people to reconnect their minds and bodies with the present moment is when their physical setting is somewhere immersive and beautiful, such as in a yoga studio with others, or in the mountains. A question that I hope to investigate in this paper is how architecture can take phenomenological lessons from nature create an environment that nurtures people's connection with the present moment and their engagement with the feelings and sensations that come with it.

Nature

One approach to disrupt the highly controlled, sterile and regulated institutional hospital atmosphere is to create an architecture that receives and welcomes unpredictable elements of nature.

The fact that bringing nature into healthcare settings has been around for a long time - a study more than 20 years ago demonstrated how a view of nature expedites recovery times in patients (Wilson, E. O. & Kellert, S. R., 1993). The question of *why* nature has this effect is still very much up for debate, and responding to it requires both a scientific and a poetic, phenomenological lens.

Alvar Aalto states that "nature, rather than the machine, should serve as a model for architecture", following the logicthat our bodies and minds are in fact inseparable from what we define as 'nature', and have many of the same physical needs as most other organisms. As (reluctant) members of the kingdom animalia, we having very different needs to the machines that have come to shape our spaces so profoundly.

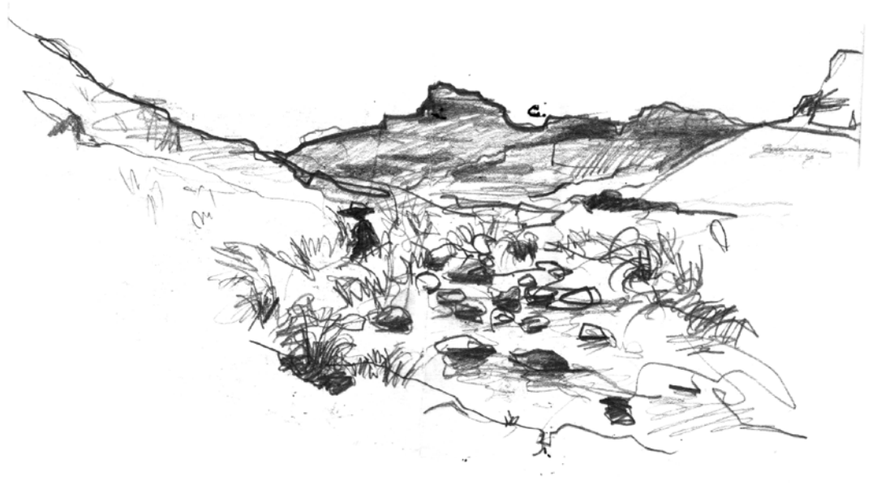
The Biophilia Hypothesis would say that nature is healing because we have an innate tendency to connect with other living things and reminds us of the fact (Wilson, E. O. & Kellert, S. R., 1993).

In Pallasmaa's view, "a walk through a forest is invigorating and healing due to the constant interaction of all sense modalities," (Pallasmaa, 2005). In other words, the eye collaborates freely with the other senses in natural environments, and our sense of reality is strengthened by this continuous interaction. He goes on to say that in the manmade realm, architecture plays the same role as nature would when it comes to forming the grounding for our perception and understanding of the world, but that built environments of the West usually stifle our non-audiovisual senses, which means they are not as invigorating or healing as a forest (Pallasmaa, 2005).

Often, the architectural industry looks at the natural elements from a quantitative and functional point of view, through the 'green building' lens of wastewater treatment, efficient daylighting and passive ventilation systems. Although these are incredibly valuable lenses, the *usefulness* of the natural phenomena often seem to overshadow the opportunity that architecture has to connect people to the elements in a qualitative, experiential way. I would argue that it is equally important, from an ecological point of view, for architecture to put people in touch with the romantic and beautiful qualities of nature.

Earth, Wind, Water and Fire are all creatures with own rules and logic – they do not follow the rules set out by an architect, and as a result, none of them conform to the Western ideals that privilege the sense of sight. Percieving them is inherently a multisensory, reciprocal experience that has been driving our survival since long before we evolved the sense of sight.

While most architectural technology is developed to effectively keeping rain, wind, sun and dirt out, I am going to focus on what kind of technologies welcome them in, and harness or celebrates their phenomenologically immersive sensory qualities. This embodies the core of mindfulness meditation – rather than fighting to keep difficult/unpredictable thoughts and emotions out of our minds and bodies, mindfulness practices encourage us to notice them, allow them in, and observe them as they pass through us.



Nest

Rehabilitation centres don't just need to be more ***engaging and social*** than hospitals, but are also lacking on the other end of the spectrum, they also need to be a more ***low-stress*** environment than a typical hospital. One entrypoint into re-thinking the rehabilitation typology is to take a step entirely away from healthcare and its norms, and instead explore a quintessential 'nurturing' environment through a phenomenological lens.

Following Alvar Aalto's assertion that our design cues should come from nature rather than machines, it may be beneficial to look at how other organisms create environments of nurture.

A bird's nest fits this criteria and gives some clues as to what the first principles of nurturing environment may be. A nest's internal materiality and shape is determined by the needs of the vulnerable baby birds- they are kept in an 'inner cup' that is gentle on the senses. This layer of the nest is soft, warm, insulated from harsh light, noise and smells. The outer layers of the nest have other purposes - they give the nest strength and structure and protection against wind and rain. They also become the threshold that the birds perch on when they are ready to fly. The following page contains an analyses the layers of a typical nest and an investigation of if/how they apply to a human home.

Figure 9

The components of a typical blackbird nest. (Image: Biddle, 2014)

Figure 10

A white-necked raven nest

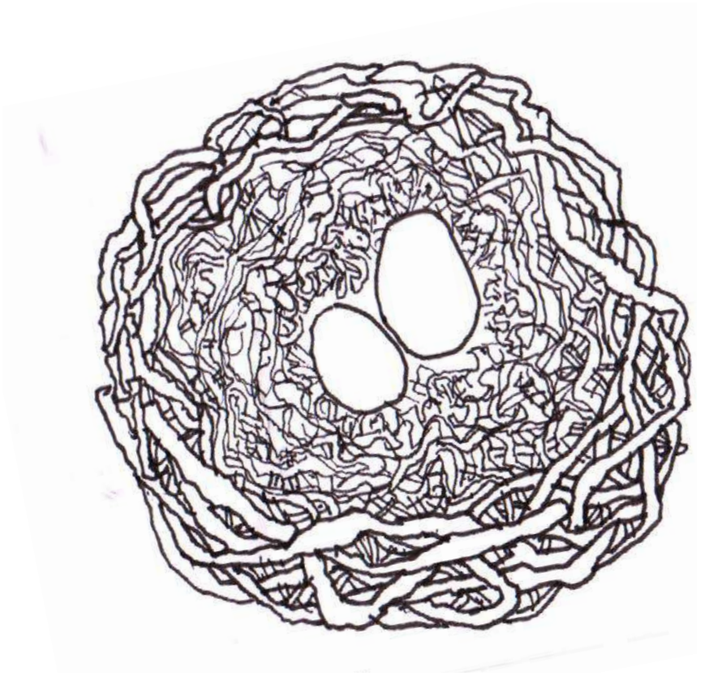
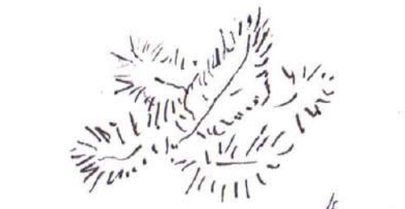


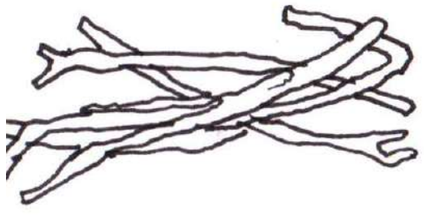
Figure 11

Illustrating the layers of a nest



The innermost layer is soft enough to protect newly-hatched chicks until they are ready to fly.

The waterproofing and windproofing provided by the outer skin allows the bird to add more delicate layers of fine materials such as grass, feathers and leaves that would otherwise be vulnerable to moisture and wind.



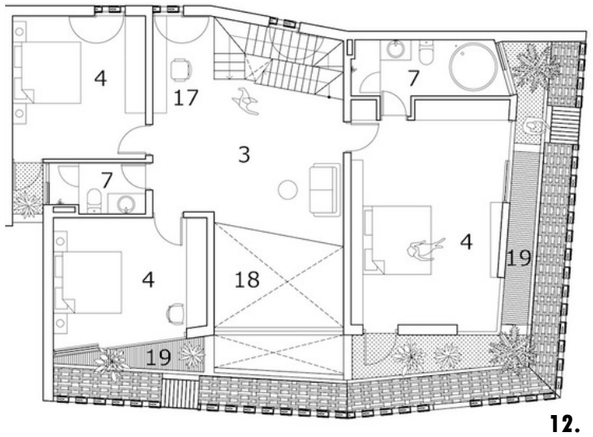
Twigs form external weatherproof layear and create the rigidity needed for structure and perching.

Figure 14

Photographs of The Tile Nest (Image: Le Minh Hoang, N. d.)

Figure 12 & 13

Drawings of the tile nest house in Vietnam



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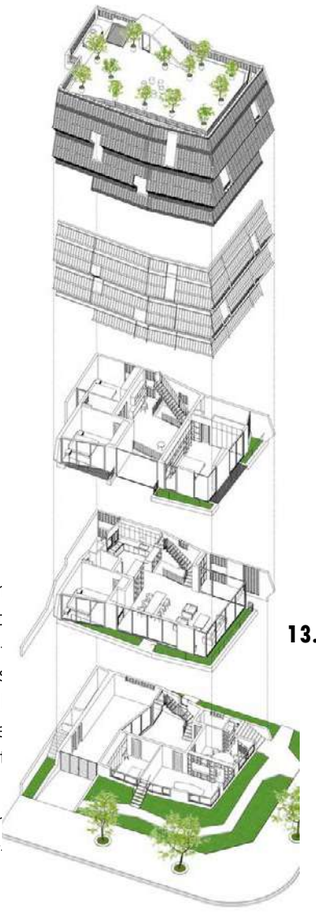
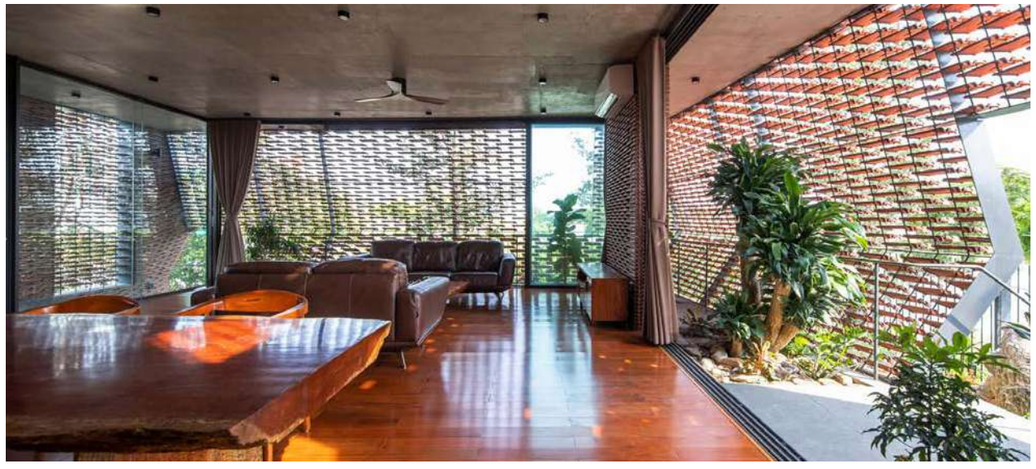


13.

'The Tile Nest'

Below is an example of a building that uses the concept of 'nest' to inform its design. The innermost layer consists of soft furnishings, curtains and carpets where the building meets the body and holds it in a state of relaxation and recuperation. The inner skin, made of solid walls and glass panels, seals out the remainder of the wind, heat and water when closed. This threshold is a place where the body is in the safety and comfort of the home, but can experience the ouside conditions of dappled light and soft breezes when desired.

The outermost skin of this building consists of steel structure threaded with roof tiles, which that provides a degree of shade, windbreaking and water-proofing.



14.

Community

Another important factor that needs more consideration in a rehabilatative setting is the cultivation interpersonal connections and feelings of home. As mentioned in part one, the isolation and ostracism of addicts is a historical problem, and is still very present today.

A multitude of psychiatrists, researchers and recovered addicts have emphasized the importance of reconnection and building relationships as a vital part of recovery. Trauma-informed design emphasizes the importance of connecting to self, community, landscape and history. Johan Hari's book Lost Connections criticizes society's approach of socially ostracizing addicts and asserts that the opposite of addiction is not sobriety, but connection. Although this is a controversial view, it resonated with many people and became an international bestseller.

Biopsychologist and fear expert Dr. Mary Poffenroth describes how a child's immediate reaction to any kind of fear is to seek connection with their person of safety, i.e., their mother or father, and this connection immediately eases those unpleasant feelings. However, in western society, turning to others for help when we have fears and overwhelming emotions is socialized out of us as we reach adulthood (especially in men), and so a pervasive replacement that people have for attempting to connect and ease unpleasant feelings is to reach for something to connect with – which unfortunately ends up being alcohol or drugs for many, many people. (Poffenroth, 2018)

The social isolation experienced by people visiting a treatment facility is exacerbated by the fact that many people seeking treatment for addiction are leaving behind a social milieu of other substance users who may not respect or support their decision to stop drinking or drugs. Often the most powerful effect a rehabilitation program can have is bringing together people who are going through the same thing and can support each other's progress. One of the biggest predictors of whether or not someone will succeed is the strength of their social and familial network (Meyer, 2023)

Design response

The main topics of research in this paper investigate areas in which the spatial norms of rehabilitation design fall short - primarily looking at how architecture can facilitate healing and rootedness by cultivating relationships between individuals, their bodies and their immediate environment. These sections are structured to explore this spectrum of sensory protection and engagement.

The first section explores the connection between an individual and the building. It begins by using trauma-informed design to investigate what kind of baseline conditions should be set up in order to avoid re-traumatizing someone. In other words, how spatial qualities can help vulnerable people feel physically and emotionally safe enough to engage with their surroundings. After this baseline of essentials is established, spatial ideas surrounding reciprocity, reconnection and re-engagement become the primary focus of investigation. This also leads up to the technical study of building with invasive vegetation and how this may help form a reciprocal relationship between the landscape and its inhabitants.

The second section looks at how architecture can be a mediator between the body and the natural elements, primarily sunlight. It explores the mechanics of how architecture becomes an insulative protector, or a threshold for engagement with the external environment. This section is divided into the dichotomy of protection and engagement - firstly looking at how sensory comfort can be achieved through strategies that create soft, indirect lighting conditions, and the secondly investigating a number of ways that architectural technology has been used creatively to craft sensory engagement with the light, dynamism and warmth of the sun.

The Baseline

Trauma-informed design is a field that has arisen out of the concern that public institutions and services - such as homeless shelters or addiction rehabilitation facilities - that are intended to support individuals are often themselves inadvertently inducing trauma. The need to actively address trauma is gaining traction as a vital part of service delivery of behavioural health. The two documents being referred to build upon the work of researchers, policy makers and practitioners, as well as individuals with lived experiences in these public institutions. (Grabowska, S. & al, e., 2021)

This section adds specificity the question, “how can architecture support the recovery process of an addict?” by looking specifically at early stages of the recovery process. Before anything else, there should be a baseline set of principles that respond to the question of how architecture can avoid re-traumatizing someone - mainly how one can avoid creating triggers and how certain kinds of spaces can help people recover from triggers. Essentially, defining the elements is fundamental to helping someone manage their trauma response and prevent it from overwhelming them. In the metaphor of the nest, this section looks at the soft, insulated inner lining that provides a safe place for vulnerable bodies.

As mentioned before, trauma is defined as the persistent hauntings of an crisis - a heavy stressor that overwhelms one’s capacity to cope. Trauma works and lives in the body. The body’s perceptual system, according to Pallasmaa, prioritizes peripheral vision over focused vision, and reacts to physical environments before we can process them cognitively. This means that the relationship between the body and the built environment is a fundamental part of how someone experiences trauma. (Grabowska, S. & al, e., 2021)

The following pages describe the three main ways that architecture can cultivate feelings of safety and comfort - firstly by creating environments that feel physically secure, secondyly by mitigating sensory triggers, and thirdly by providing choice and variety.

Boundaries and security

The trauma-informed approach suggests that the most essential atmosphere is a sense of physical and emotional safety. Principles on how this can be achieved include:

1. Physical Safety and Security: well-lit spaces, sightlines, private areas for confidential conversations and secure entrances. as well as creating certain sleeping and bathroom quarters that are for women only.

2. Scaling the architecture appropriately according to the dimensions of the human body. This may involve designing cozy nooks, quiet retreats, or private areas where people can have personal space and control over their interactions. (Pallasmaa, 2005)

3. Circulation Design: Efficient and intuitive circulation paths contribute to a feeling of safety. Clear pathways, well-defined entrances and exits, and logical layouts help individuals navigate without feeling trapped or overwhelmed.

4. Privacy Options: Providing flexible privacy options is a way to accomodate varying comfort levels and needs. Moveable screens, curtains, or adjustable partitions offer individuals the ability to control their environment according to their preferences. (Grabowska, S. & al, e., 2021)

5. Natural Surveillance: Incorporating windows and transparent partitions, allows for natural surveillance. It enables people to have a clear view of their surroundings and others, which can help deter potential threats. (Grabowska, S. & al, e., 2021)

Sensory Comfort

Architecture with sensory boundaries essentially means carefully designing environments that provide protection and comfort for all senses – sight, smell, touch, taste, sound and temperature. (Grabowska, S. & al, e., 2021)

The primary concept advised by TID is to avoid simply adding and subtracting sensory information (fig. 15), and instead creating 'symphonies' of sensory input. Instead of completely blocking out certain sensory experiences, the design could focus on altering the quality of those experiences.

The principles incorporated into the design are as follows:

1. Thermal and olfactory comfort: Shaded porches beside porous openings allow cool air to enter the internal spaces, and as it warms, it rises and exits through a high opening in the roof.

2. Human body as a scale: comfortable widths of passages, rooms and walkways that are not cramped or imposingly large, but tailored for the movement of the human body. Certain spaces intentionally designed for private conversations, and others for atmospheres of togetherness and sociability.

3. Acoustic comfort: quiet spaces and loud spaces are separated by courtyards and thick walls.

4. Visual comfort: intentional placement of direct and indirect light. Providing shade. Primarily using indirect light that has been bounced off of other surfaces (Lam).

4. Visio-haptic comfort: warm-coloured materials with familiar textures can create surfaces that allow the visual sense and the haptic sense to collaborate and invite the body in. This can also counteract insitutional or clinical atmospheres. (Grabowska, S. & al, e., 2021)

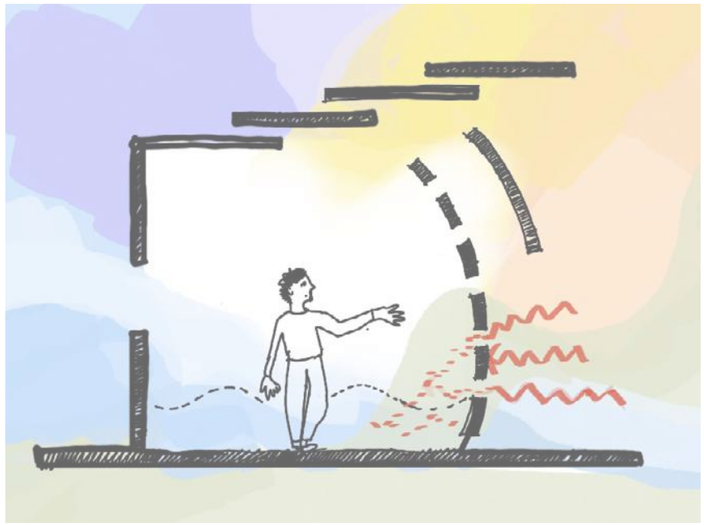


Figure 15 & 16

Illustrating the idea of blocking sensory information and rather creating 'sensory symphony'

Choice

The next step is establishing what spaces are needed if someone is under a lot of stress and needs to calm down. According to Trauma Informed Design, modulating atmospheres and environmental stimuli in Architecture has the ability to calm or overstilumate the body's response to perceived stressors.

Research identifies common responses that people have to stimuli and trauma specifically 4 types - when someone encounters a situation that triggers their trauma, their bodies immediately signal 'danger' and dispatches a physiological response of 'fight, flight, freeze or fawn'. Trauma-informed design suggests that these stress responses need different spaces in order to be dealt with by the person struggling, and phenomenology can offer some insights into how these spatial qualities could be achieved.

Fight mode: Active discharge – a place to escape, run, scream and get a dose of adrenaline in an safe environment. Catherine Gray's autobiography speaks about how, during early recovery, she did more exercise than she had ever done or would ever do again, simply as an outlet for her overwhelming feelings.

Fawn mode: people who go into people-pleasing mode when they have a trauma stress response can benefit from areas with welcoming social encounters, for example with peers, counsellors or pets.

Flight mode: Refuge – calming isolation without too much sensory information, where someone can rest, breathe and reconnect to themselves. Pallasmaa says that the most important thing that sound can to is create tranquility, so appropriate acoustic insulation would be critical in this space.

Freeze mode: Distraction – gently breaking someone's tunnel vision with something that can occupy them and distract them from crisis that has taken over their brain. Gentle Stimulation that brings people back into their bodies, a pleasant and non-overwhelming sensation that encourages them to come back to the present moment.

Having options are also important for making people feel in control and like they have agency over their experiences, especially if some may be sensitive to feelings of powerlessness.

An inherent quality of the natural landscape that is desirable is the quality of choice. It does not hold as much prescription as the designed world. We can sit on whatever looks flat, choose a spot that feels shaded and conveniently close to running water. Our movement is not prescribed by the architect's placement of dining or sitting areas, but determined by our sense of the place.

According to TID, one way to allow people choice in the design of a space is by using nested layers – having a gradient of different spatial qualities (pallasmaa suggests finding a balance between binaries of introversion and extraversion, for example) in one space, which allows different people to occupy the same space in whichever way makes them feel comfortable.

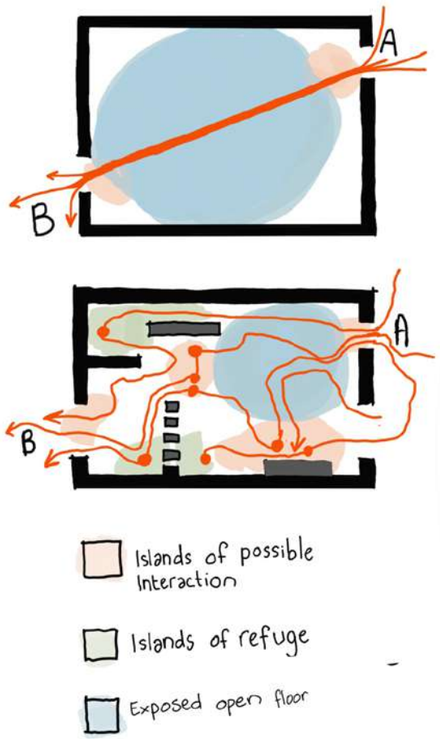


Figure 17

Illustrating the idea of unaccommodating spaces compared with nested spaces.

Engaging with the Building

According to the trauma-informed design principles booklet, architecture has the opportunity to be the first point of contact to cultivate safety and connection.

If the above needs for safety and comfort are met, it creates an environment that may allow someone to emerge from their shell and feel more ready to engage with their surroundings and treatment program. This brings us to the next question – how can a building become an environment that people would feel compelled to engage with?

TID suggests that because many traumatized people bond more quickly with familiar objects than with people, healing could be catalyzed by creating a safe and intimate somatic relationship with the building itself.

“A meaningful architectural experience is not simply a series of retinal images. The ‘elements’ of architecture are not visual units or Gestalt; they are encounters, confrontations that interact with memory.” (Pallasmaa 2005, p67)

Trauma-informed design suggests ‘identiy anchors’ –a way for people to see themselves in their environment and feel a part of something bigger. The goal is to counteract feelings of isolation and alienation with feelings of belonging.

The early days of kicking an addiction are said to be a great equalizer. No matter how different the addiction treatment centre visitors are in culture or background, they are united by having the same struggle. Combating addiction and adapting to a new way of life is the central part of their lives at that moment in time.

Finding some kind of symbolic expression of this goal without being reductive or patronizing could be an interesting challenge. A way this could be done is if people participate in the creation of aspects of their environment, or participating in making incremental improvements to the place for the benefit of future cohorts who pass through the rehabilitation centre. Examples of this would be murals, mosaics, gardens, furniture, or even structures.

What follows is an exploration of a variety of approaches to space that promote connecting with a building, and a connection with other people.

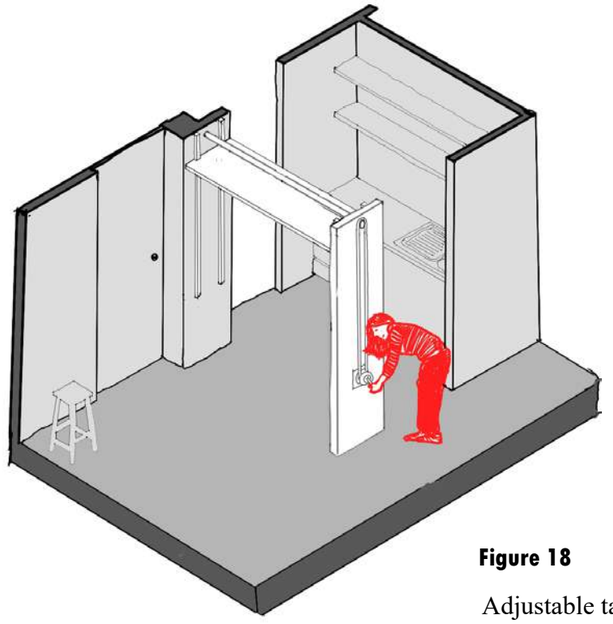


Figure 18

Adjustable table element in an apartment by Natura Architects.

Case Study: Aldo van Eyck's Orphanage

Aldo van Eyck, a renowned Dutch Architect, was critical of early post-war modern architecture for its lack of connection to the human element (Van Eyck, 1962)

An orphanage was commissioned for children of all ages. The brief included sleeping quarters, gymnasium, a kitchen, library, laundry room, and administrative spaces. In his design, van Eyck prioritized a human-centered approach that fostered a profound connection between occupants and the building. This connection was achieved through a range of deliberate design principles:

1. Calibrating the scale and proportion of spaces: By crafting human-scaled environments that evoked comfort and ease, he made the structure inviting and relatable.

2. Courtyards and Outdoor Spaces: Infusing the orphanage with numerous courtyards and open areas, Van Eyck established communal spaces where residents could engage, interact, and immerse themselves in nature. A pocket of nature-rich space is an example of an environment that creates shared experience.

3. Diverse Spaces: The design embraced a diverse array of spaces, each serving distinct functions and generating distinct atmospheres. This diversity empowered occupants to select spaces that resonated with them. This echoes the principles laid out by trauma-informed design that emphasize the importance of choice.

4. Detail-oriented Craftsmanship: Van Eyck emphasized attention to architectural detailing. He purposefully designed elements such as windows, doorways, and materials to enrich the ambiance.

5. Playful and Expressive Aesthetics: Van Eyck incorporated unconventional elements like asymmetry, unconventional shapes, and vibrant colors. These features kindled curiosity, inviting exploration and deeper engagement with the building.

6. Fluid Circulation: The building's layout was planned to encourage organic movement and social interaction. Open corridors and pathways facilitated seamless navigation, facilitating chance encounters.

In essence, Aldo van Eyck's design of the orphanage transcended mere functionality by addressed the human experience. This orchestration of design principles coalesced into an architecture that did more than shelter - it resonated with its occupants, and forged a connection that endured beyond bricks and mortar. (Archdaily, N. d.)

Figure 19

Amsterdam Orphanage interior view (Unknown author, 1960s)

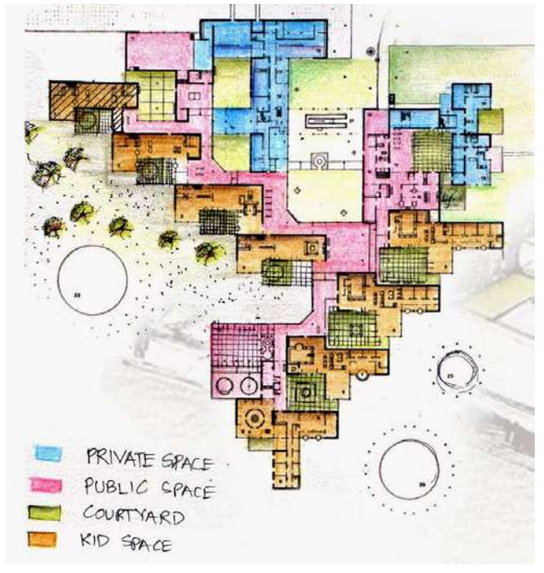


Figure 20

Diaram of spatial use in the orphanage (Image: Unknown author, N.d.)

Figure 21

Section through the orphanage showing dome geometries and scale. (Image: Fracalossi, 2011)

Personalization

"Our bodies and movement are in constant interaction with the environment, the world and the self inform and redefine each other constantly." (Pallasmaa 2005)

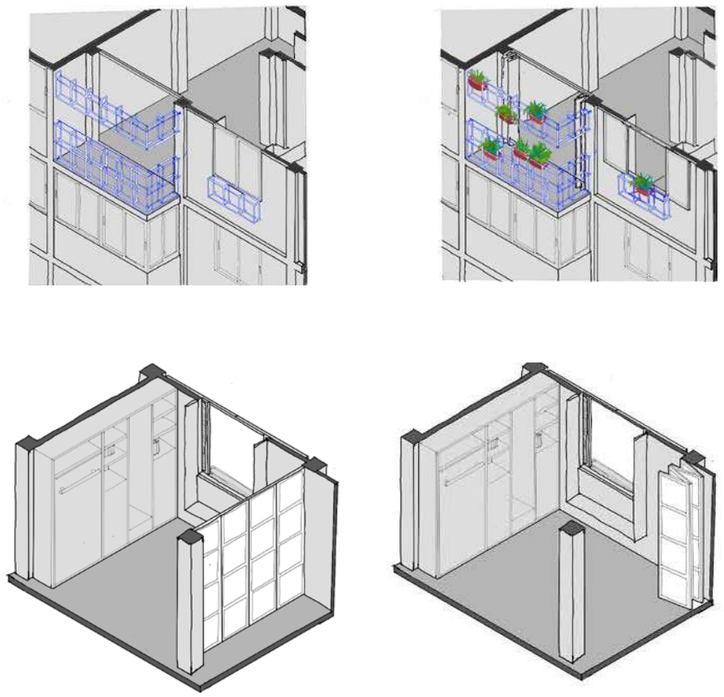
How does one create a space that someone can have an interactive, give-and-take relationship with? At a time when someone's world is being turned upside-down, spaces that can be adapted and personalized would be beneficial for helping individuals feel a sense of agency and ownership over their environments. The 'Ikea effect' is a cognitive bias studied by scholars in 2011. It describes how people attach more value pieces of furniture that they have assembled themselves. (99pi article)

Anton Nikolov, a user experience designer, describes how he frequently incorporates this strategy into his work, by allowing the users to contribute something that is 'high value' but 'low effort'. He says that it makes their first experience with an app feel alive and dynamic, even if it is something as small as filling in information and setting up an account. (99pi) Because people occupy a rehabilitation centre for a maximum of a few months at a time, the adaptations need to be flexible and reversible within this timeframe.

The following renovation by Natura Futura Arquitectura acknowledges that everyone inhabits spaces differently depending on their needs. These humble interventions of operable walls, tables, beds, blinds and planter frames collectively allow the spaces to evolve according to these needs.

Figure 22

View of all operable systems in the apartment.



Figures 23,24,25,26

Sketches of the different configurations of various operable elements in the apartment.

Part Three: Crafting with Light

- **A connection with sun and sky**
- **Sensory Comfort**
- **Sensory Engagement**

Figure27

A spectrum of sensory experiences of light in famous works of architecture

A Connection with the Sun and Sky

This section explores how built environments have the potential to help connect people to the light, warmth and cyclical rhythms of the sun. This section willl be divided into two parts: how to make calm spaces of sensory comfort, and how to make dynamic spaces of sensory engagement.

The first section, *sensory comfort* will use *Sunlight as a formgiver for architecture* as its the primary source to unpack:

- Perception
- The Opening
- Strategies and Techniques

The next section looks at how architecture can harness sunlight to make engaging spaces of dynamic sensory stimuli will be unpacked through case studies that have used light in creative and inspiring ways to create visual intrigue, spacifically:

Spaces that celebrate the dynamic nature of sunlight: Creating highly variable lighting that is dependent on the external weather conditions and time of day and year.

Spaces that celebrate the warming nature of sunlight: How to create pools of direct light.

Spaces where sunlight collaborates with other elements, and allows the eyes to collaborate with the other senses.

This dichotomy of comfort and engagement ties into the concept of the nest, as well as the trauma-informed design section that discusses how different people require different spaces when they are experiencing a trauma response - some need sensory withdrawal, while others need sensory engagement. Some need small spaces to hide, and others need big spaces to be physically vigorous.

People may also need these two extremes at different stages of their healing. Early on they may need gentleness and comfort to feel safe anough to ease back into their bodies, while later they may need engagement and dynamism to help them reconnect with the outside world and develop the strength face all the challenges it will throw at them.

The primary resources used for this section are as follows:

Architecture: Space, Form and Order (1979) by D.K. Ching provides a glossary of the various categories of openings and what effects they have on space with regard to light and enclosure.talks about how light enlivens the colours and articulates the textures and forms on which it falls. The space of a room is animated by the changing patterns of shade and light created by the sun. The intensity and distribution of light in a space can affect the mood and atmosphere of a room profoundly.

Sunlight as Formgiver for Architecture (1986) by William M.C. Lam offers an argument for sunlight use in buildings both for economical reasons, energy efficiency as well as the importance of sunlight in creating human delight. According to William Lam, Sunlighting design primarily involves planning the geometric relationships between architectural elements and the available light in order to direct this light where it is wanted (Lam, 1986). While designing for energy efficiency may be easily calculable, designing for the fulfilment of human needs and values is more complicated and requires more attention than it is usually given.

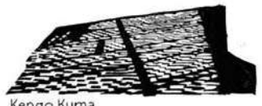
Lam asserts that they must be balanced in order to create a successful building, but that comfort and delight- should be the central priority, to which all other agendas must respond. Too often this is the last category to be considered, rather than the first (Lam, 1986). Although the concept of working *with* rather than combatting *against* sunlight is also an economical endeavor, this paper exclusively investigates this category of ‘user comfort and delight’.

Low variability and contrast: predictable and calming

Shigeru Ban
Naked House, Japan

Peter Zumthor
Thermal Baths, Switzerland

Daniel Libeskind
Royal Ontario Museum, Canada



Kengo Kuma
New Museum, Xiangshan, China

Finn Geipel + Giulia Andi
Cite du Design, France

High variability and contrast: dynamic and engaging

Sensory Comfort

According to Lam, ‘comfort’ has many aspects, including visual, thermal, aural and psychological. ‘Comfortable’ is not a concept that can be quantified as a specific amount of illumination or heat, but the *parameters* of these qualitative aspects can be described (Lam, 1986).

Sunlight orientates us in whatever environment we find ourselves in. According to Lam, The need to feel comfortable within a place is influenced by our biological need for survival, sustenance and protection. A visual and thermal connection to external sunlight conditions allows us to intuitively know our location and level of enclosure, feel a sense of time, and stay in touch with the external weather conditions. We subconsciously evaluate all of these elements and reach a qualitative judgement of a place and how comfortable we feel in it (Lam, 1986).

Lam asserts that designers should learn to design with concepts that can be judged intuitively with their eyes and brains, rather than having to rely on instruments. In this spirit, Lam discusses some information about our perception of light itself that will be extremely helpful in developing an intuitive sense of how to design with light:

The dominant characteristic of human vision is adaptation. We unconsciously compare everything we see with a reference level of colour and lightness, and all visual experiences are experienced in relation to past or present knowledge of the environment. Another big factor in perception is ‘Expectation’ (Lam, 1986).

‘what we want to see’ should be the focus of the light. Any light or darkness that interferes with this is called ‘visual noise’, which we should avoid accenting or creating. A ‘noisy’ visual environment is one that is dominated by visual information that is irrelevant to the interests and needs of the occupants - for example spaces that are lit by unpleasantly bright flouresscent light fixtures that monopolise our attention (Lam, 1986).

Latitude, Climate and orientation are the three universal design influences that affect planning for sunlight use at all scales. The sun moves 15 degrees per hour, and its location in the sky has two components: ‘bearing’ (its position relative to North) and altitude (its height above the horizon) (Lam, 1986).

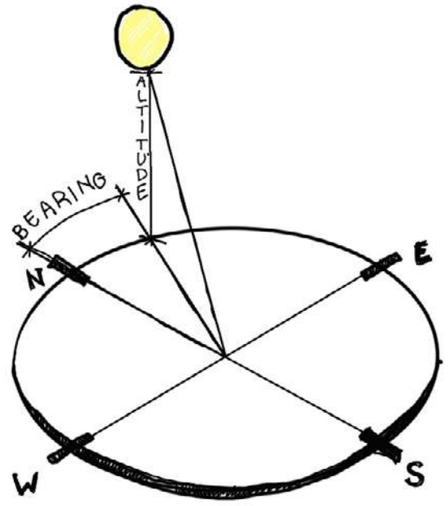


Figure 28

Bearing and altitude

Openings

D.K. Ching talks about openings in his book, Architecture: Form, Space and Order. He mentions how the intensity and direction of sunlight is predictable to a degree. This means that if shading devices and surface materiality is excluded, the impact of sunlight on the internal space is dependent on the following parameters of the opening:

LOCATION affects the levels of softness or contrast between different surfaces within the room. Placing openings within planes will make them appear brighter than the adjacent surfaces, which can cause excessive contrast. To minimize this effect, the surface can be illuminated by a second source of light (Ching, 1979).

Using the ceiling and upper walls as the primary source of reflictive light is an strategy for creating a comfortable environment that is free from glare and uneven light. To do this, the following rules of thumb apply: Locate the ceiling as far away from the light source as possible in order to achieve a more even spread of light reaching the ceiling. This means either raising the ceiling height or lowering the windows (Ching, 1979).

The other important parameters that determine the character of a space's lighting are ORIENTATION, which determines how much direct or indirect light will enter a room at certain times of the day, and SIZE, which plays a role in determining the amount of daylight that enters a room (Ching, 1979).

The placement of a sunlighting opening in relation to the rest of the architectural design can be classified as sidelight, toplight, or atrium configurations. The choice of the primary opening placement is usually determined by the functional requirements of the building.

Because views have been proven to actively contribute to the healing process (Kellert, 1992), this technical study will be primarily investigating sidelighting. A number of other factors also make sidelighting the ideal lighting method for this project, such as its location - the site is on a slope that is surrounded by clear, highly desireable views of the mountains that cradle the Fish Hook valley. The other main advantages of sidelighting include its ability to provides light, ventilation and view simultaneously through one opening that can easily be protected from the elements.

Sidelighting also comes with a number of challenges:

The ratio of floor area to sunlight opening is limited by sidelighting, which means that sidelighting is most effecitve when buildings are narrow. (Lam, 1986).

Because the light source and view are now one and the same, orientation becomes a very important part of the planning process. (Lam, 1986).

There can sometimes be conflicts between a need for shading devices, and a need for a view. (Lam, 1986).

Technologies and strategies to mitigate these challenges will be expanded upon in the following pages. In this project, there may be some rare cases where it may be beneficial to make use of toplighting attempting to achieve a highly regulated, evenly lit space - for example in therapy rooms or spaces that require medical precision.

Strategies for Sidelighting

Effective sidelighting involves optimizing the indirect lighting potential of sunlight while also taking care of shading and glare management. Because sunlight is constantly in motion and has a very high intensity, it is difficult to use it in its 'direct' form, and according to Lam, should be used in a diffused form, preferably as indirect light. Indirect lighting can be created by taking advantage of some of the inherent qualities of light, such as reflection, diffusion, baffling, absorption and refraction. What follows is an overview of some of the strategies and techniques that are used to achieve these goals (Lam, 1986).

Redirection

Although light is nearly always non-directional when it is generated, it can easily be made directional by placing surfaces in its path. The distance of the earth from the sun makes sunlight highly directional, and it can be diagrammed as parallel rays. Using optimal orientation - ie north-facing openings - makes it easier to redirect light and design efficient fixed devices (Lam, 1986).

There are three kinds of light sources - point source, line source or an area source. Point sources are create sharp shadows, Line Sources produce shadows along one axis and area sources produce minimal shadows. They can be created by reflecting light from the windows against high walls and ceilings. In order to get maximum reflectance, minimize the surface area of the ceiling and make use of reflective materials and light colours (Lam, 1986).

Another useful principle to note is that if a comfortable environment is to be achieved, distributing light to the areas of the room where it is desireable is more important than having a high level of average illumination (Lam, 1986).

Transmission control

Glazing materials have varying degrees of light and heat transmission, absorption and reflection. The most desireable characteristic when it comes to sunlighting is to have a glazing that can allow a maximum amount of the visible light spectrum, while blocking as much of the ultraviolet and infrared rays as possible. In temperate climates such as Cape Town, this can be done most cost-effectively with green-tinted glass, or with clear double-glazing (Lam, 1986).

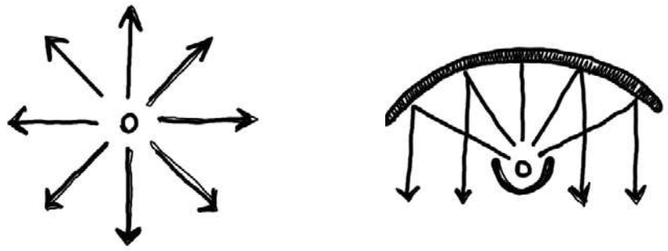
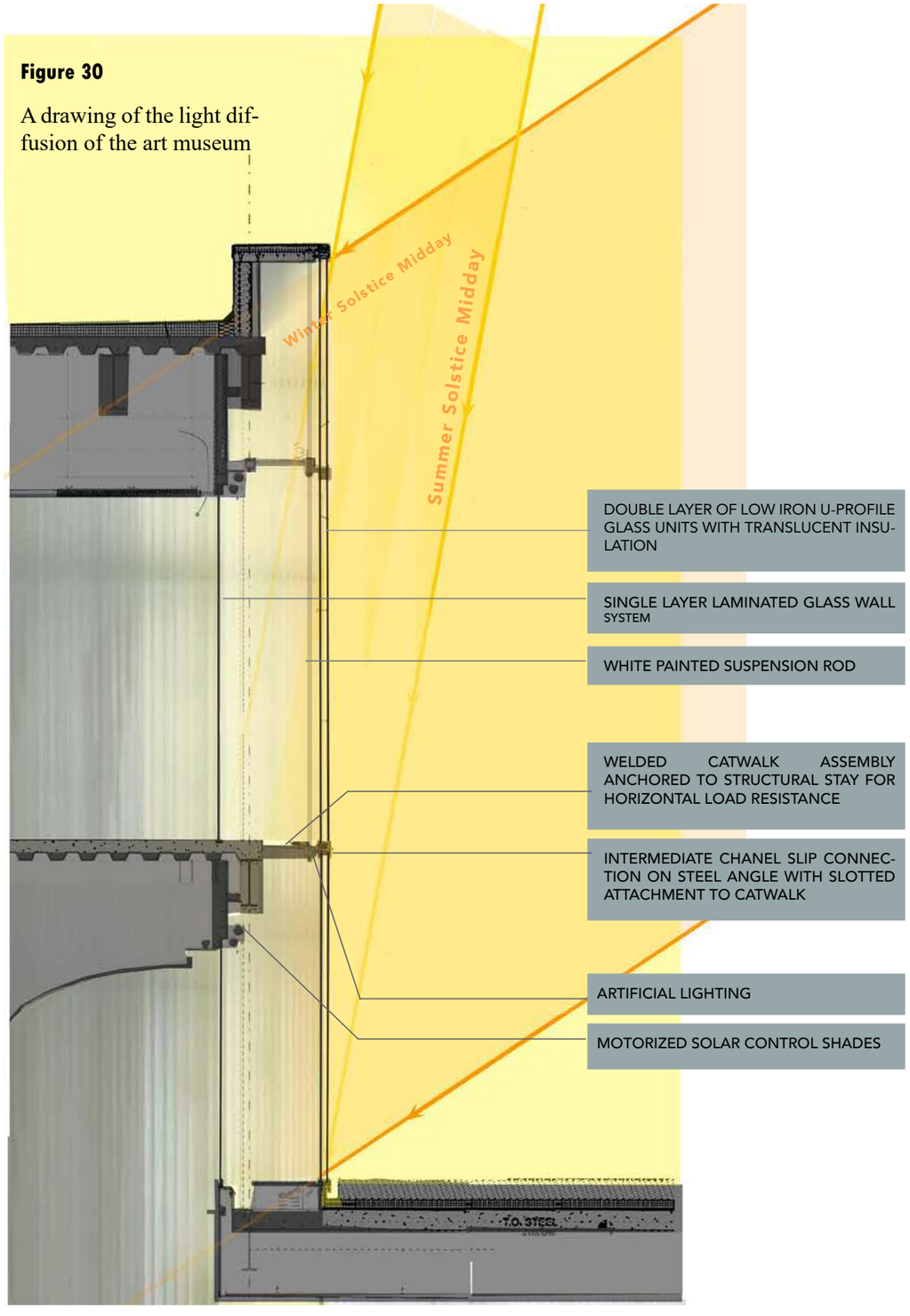


Figure 29

Creating directional light from a point source

Figure 30

A drawing of the light diffusion of the art museum



Diffusion

This strategy is useful in areas such as galleries or hospitals, when a high level of average illumination is useful. Regardless of the intensity of the external light conditions, the illumination of the internal space is even and predictable after passing through the glass screen system of these gallery walls. A facade made from three layers of glass diffuse the light as it passes into the Nelson-Atkins Museum of Art, designed by Steven Holl. This effect is only desireable in specific circumstances, as it can create visual noise - i.e. ecessive illumination of areas that do not need to be illuminated (Lam, 1986).

Figure 31

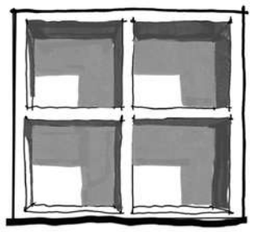
Photograph of the Nelson-Atkins Museum of Art (unknown author, N.d.)

Shading Devices for Sidelighting

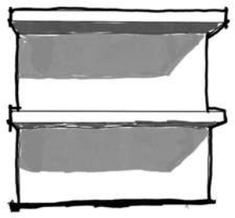
Shading devices can be horizontal or vertical. Horizontal shaders are most effective in north and south facing windows, and total shading can be achieved year-round by shading devices that are adjustd seasonally. Each type serves a specific purpose based on building orientation, climate, energy efficiency, and design preferences (Lam, 1986).

Lightshelves offer uncluttered shading and even sunlight distribution, minimizing glare and enhancing illumination deeper into a space. They redirect light away from windows, promoting a balanced spread. While initial costs may be higher than some alternatives like blinds, lightshelves are cost-effective in the long run due to durability and ease of maintenance (Lam, 1986).

for east and west facades, Vertical shaders are most effective, but needs supplementary devices in the mornings and evenings when the sun angle is low. Vertical fins direct sunlight downward.

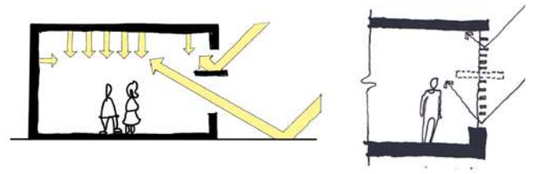


Eggbox shaders provide maximum shade.

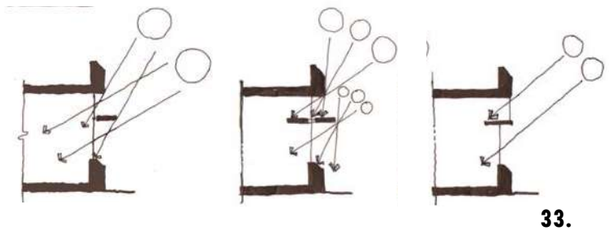


Horizontal Overhangs: Fixed extensions for consistent shading in temperate climates. They respond to solar altitude and ar most effective when the sun is at a high angle at noon.

32.

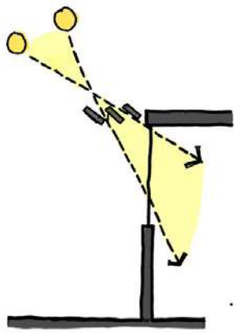


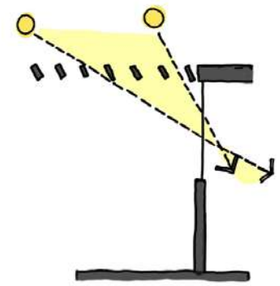
The lightshelf creates shade by redirecting sunlight. The ideal location for a light shelf is just above eye level.



33.

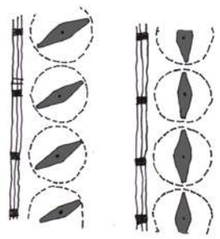
These diagrams show the ideal configuration for a lightshelf in a temperate climate such as that of Cape Town: ie projected out past the facade to shade the lower glazing during the cooling season.





34.

Adjustable Louvred Overhang: If horizontal louvres are parallel to a north-facing wall, they can either block high angled sun when closed, or low-angled sun when open.



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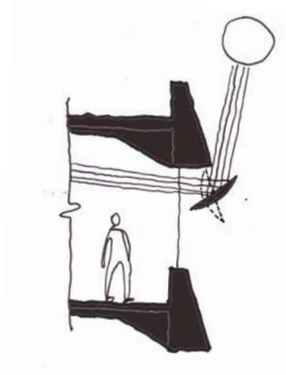


36.

Adjustable vertical Louvres: Opened vertical louvres provide shade early in the day, and closed louvres can provide total shade for midday.

Lightshelves can also be designed to be adjustable according to the time of day or year.

SENSORY ENGAGEMENT

‘Expectation’ is a big factor in perception. Because of our expectations, we percieve wild fluctiatuons in natural daylight as normal and not particularly noticeable. The same fluctuations in a highly controlled environment that employs artificial light would be disturbing or percieved as a problem - for example indicating that a lightbulb needs replacing (Lam, 1986).

This expectation of dynamism from the sky means that natural light is an ideal tool with which to create engaging sensory stimuli that does not create feelings of disturbance and problems. This section briefly touches on engaging lighting concepts through the use of case studies and analyses the innovative ways people have created spaces of sensory intrigue through the use of light (Lam, 1986).

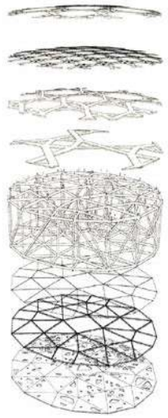
Figure 37

Illustrating the idea of a perforated building that celebrates the sensory qualities of sun and wind

Sunbeams

The “Rain of Light” at the Louvre Abu Dhabi, designed by architect Jean Nouvel, features a geometric dome that filters sunlight through its intricate lattice of metal and glass.

The Louvre Abu Dabi uses the layering of geometric domes to disperse direct sunlight into dynamic, dappled shafts of light. There is an outer layer of dome and an inner layer of dome, and they are connected by a domed space frame. These layers create organic and dynamic shafts of light that appear and dissappear like the shifting patterns seen while moving beneath under a palm oasis (Archdaily, N. d.).



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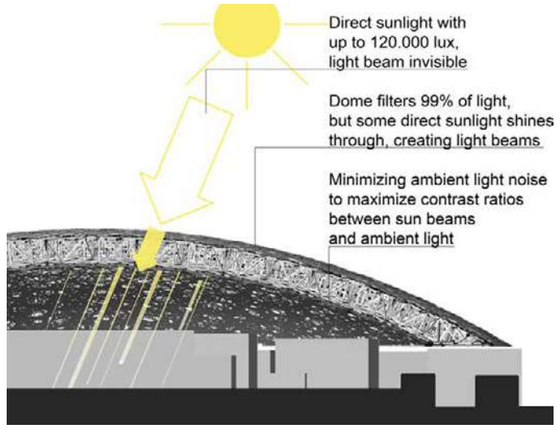

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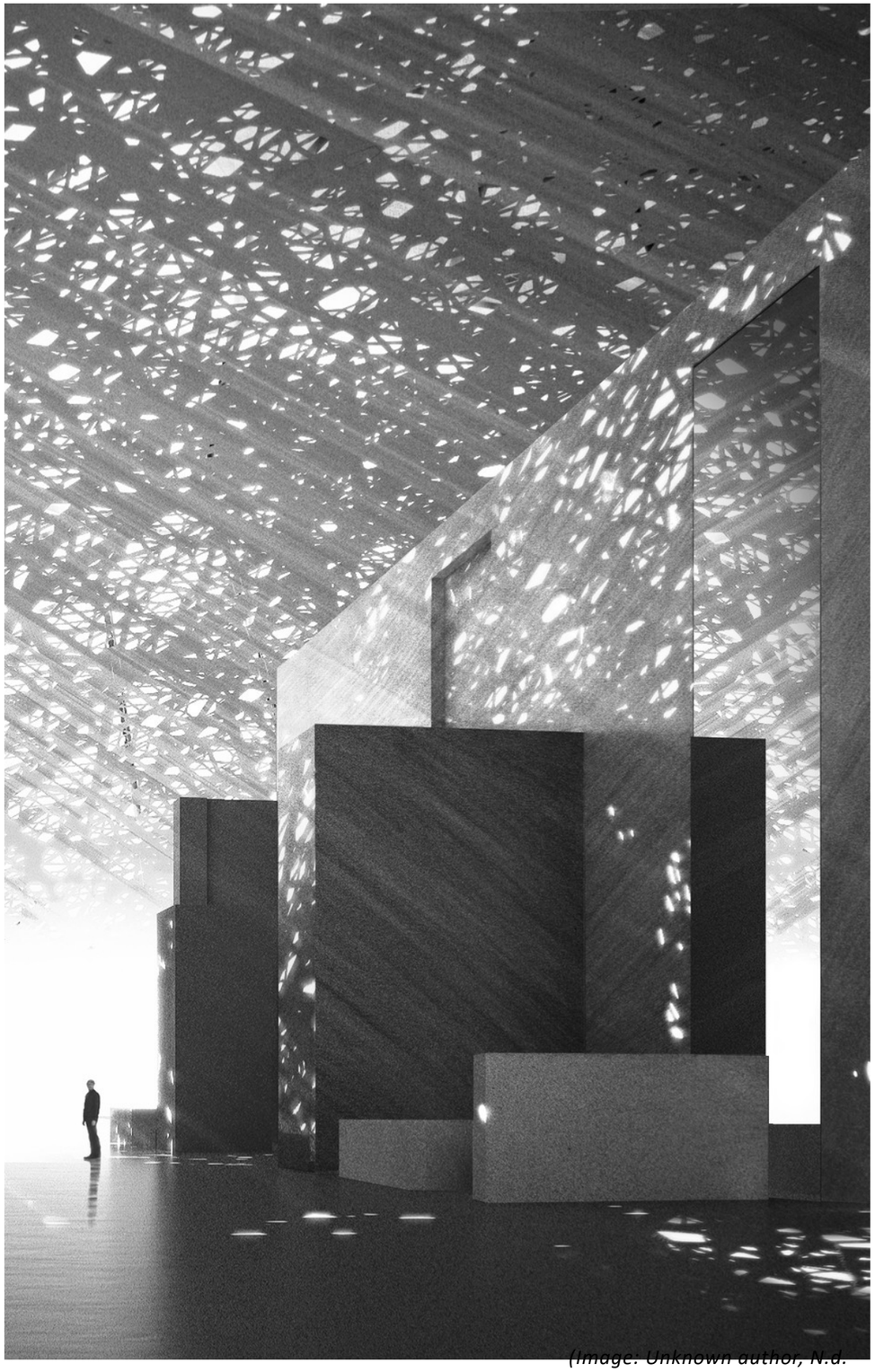


(Image: Unknown author, N.d.

Dapple

According to Lam, the illumination levels needed by some indoor plants (100-500 footcandles) are many times higher tan those needed for human activities, which means that plants should be placed where the penetration of sunlight is at a maximum.

This case study of a Cape Town apartment block designed by Adele Naude Santos uses the strategy of placing a loggia on the northern facade. It is filled with festooning vines and tropical plants to create a dappled, green-lit internal environment. During the summer months, it effectively regulates sunlight and transforms into an expansive suspended garden. Additionally, planter boxes strategically placed on higher levels ensure the privacy of the gardens below by preventing any direct line of sight.

Another effective way to achieve this dappled and green quality of light is to have the planter beds inside the house on the northern facade where the light is most intense, effectively creating a kind of domestic greenhouse.

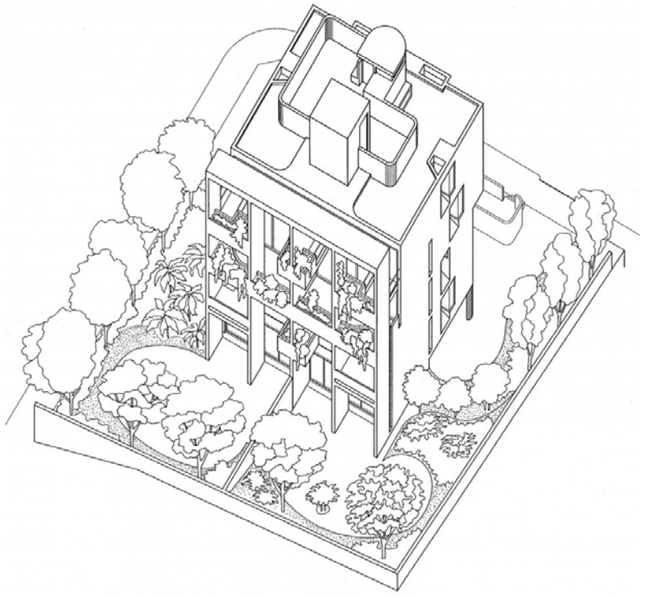


Figure 41

Axo showing the Loggia attachment (Image: Adele Naude Santos, N.d.)

42.

43.

44

45

Figure 42

Photograph of the Loggia facade (Image: Adele Naude Santos, N.d.)

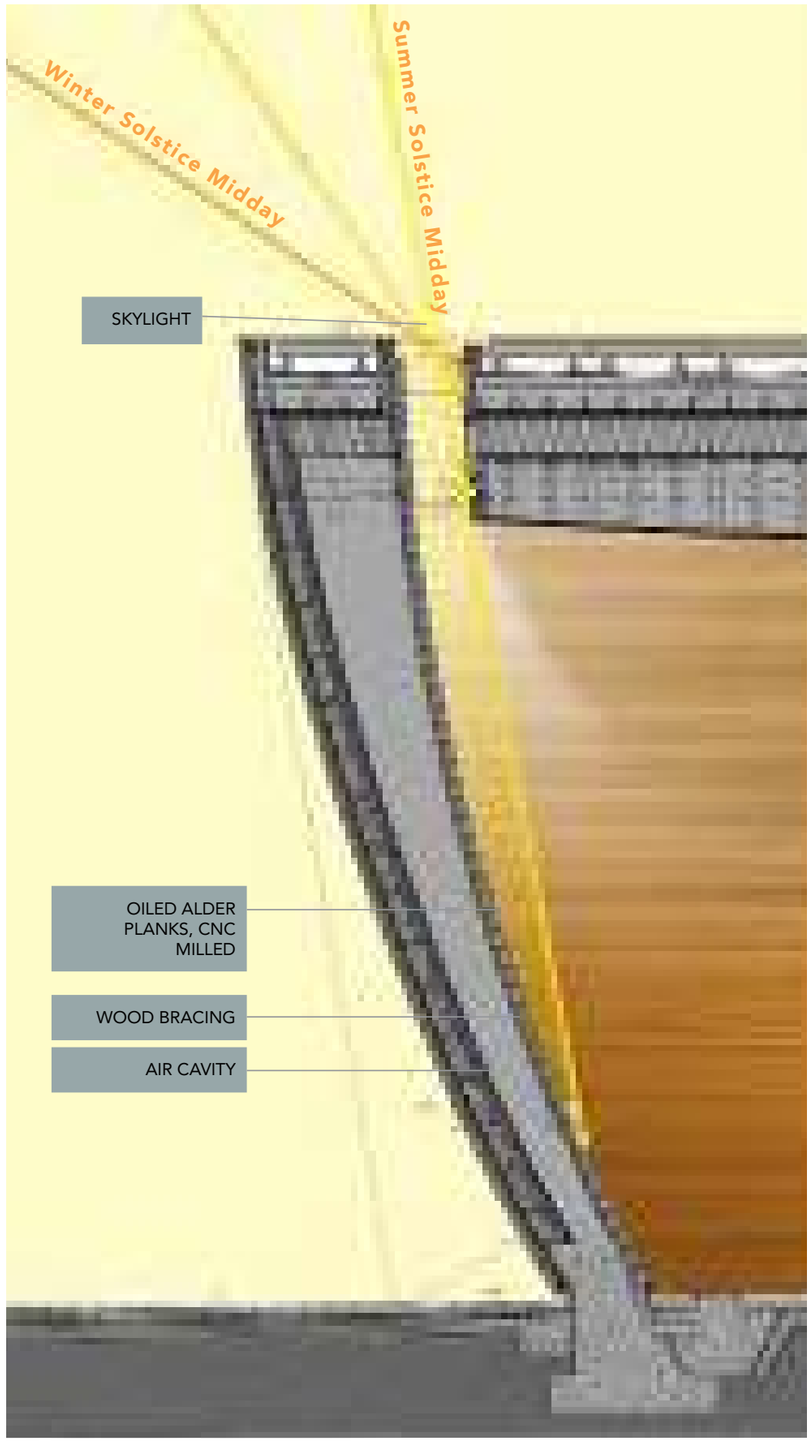


Figure 46

Diagram showing the structure and sunlight direction in the Kamppi Chappel

(Image: Czech, 2023)

Texture

The Kamppi Chapel in Saynatsolo, Finland, uses sunlight to reveal the soft, organic wood textures of its curved walls. A skylight runs the circumference of the cieling and beneath it is a light passage that allows only minimal amounts of direct light to bleed into the interior. The rest of the natural lighting is a result of light bouncing off of the warm timber surfaces.

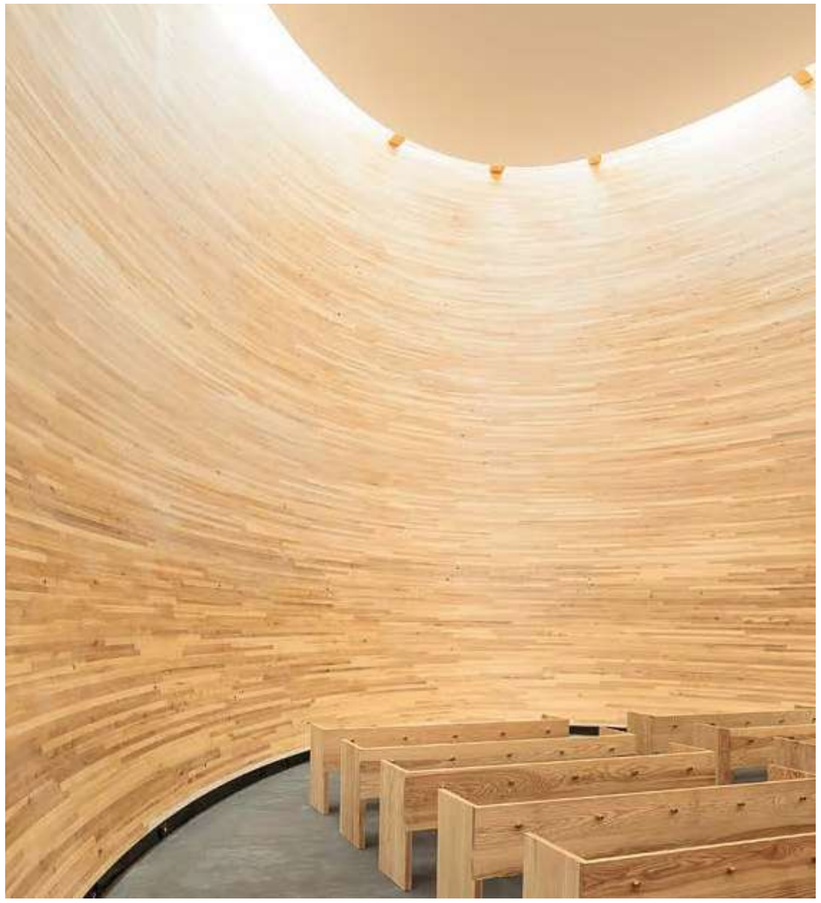


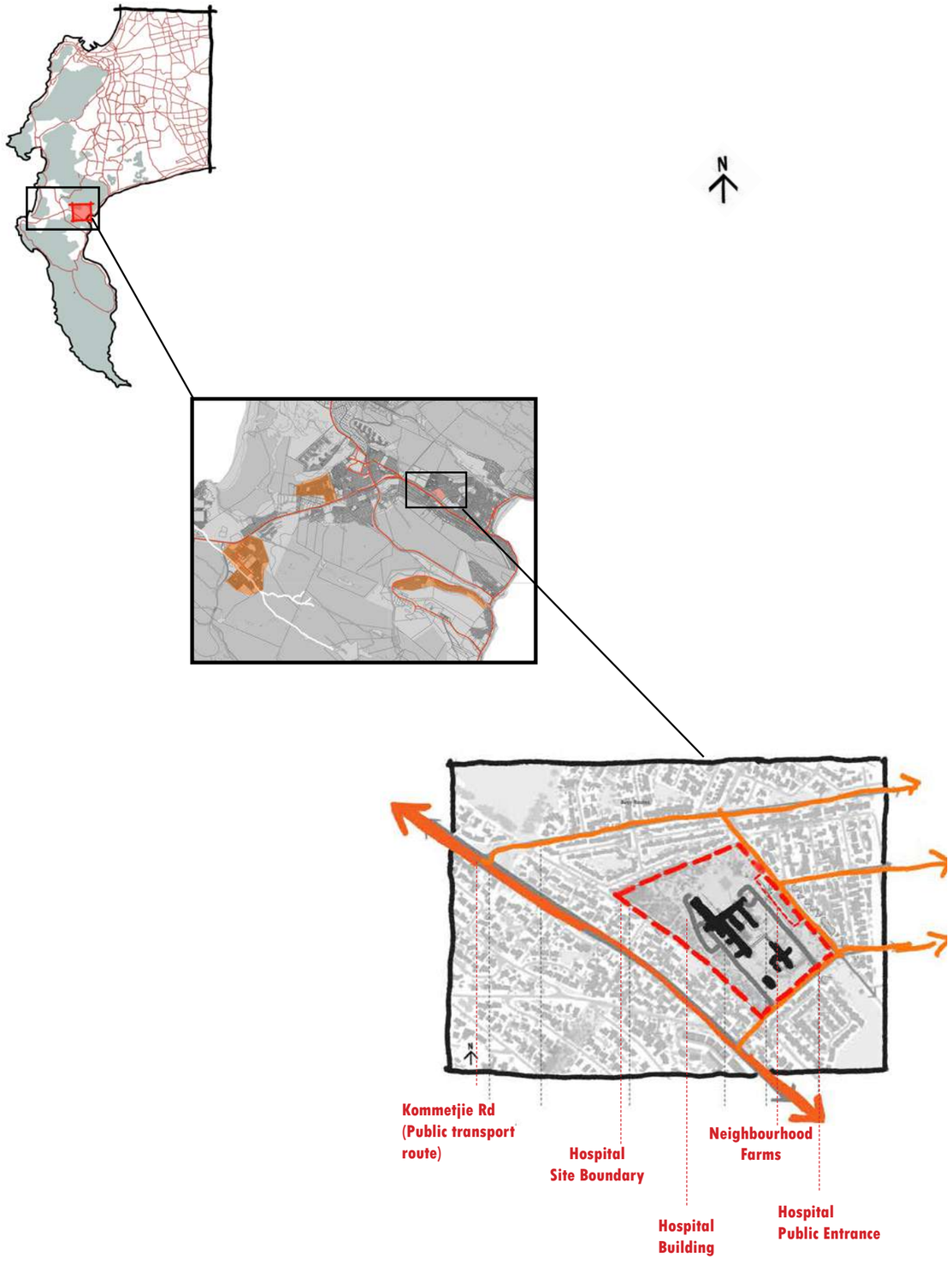
Figure 47

Photograph of the Kamppi Chappel interior (Image: Unknown author, N.d.)

(Image: Unknown author, N.d.

Part Four: Introducing Site

- **Locating Site**
- **The life of the site: Character**
  Stakeholders
  Ecology
- **A material connection to Landscape**



Locating Site

To recap the ‘what exists’ section, There is a need for accessible addiction treatment facilities that serve communities in the southern reaches of Cape Town.

False Bay Hospital is a district hospital. It is located in Fish Hoek and has a catchment area of the South Peninsula Health District of the Metro Region.

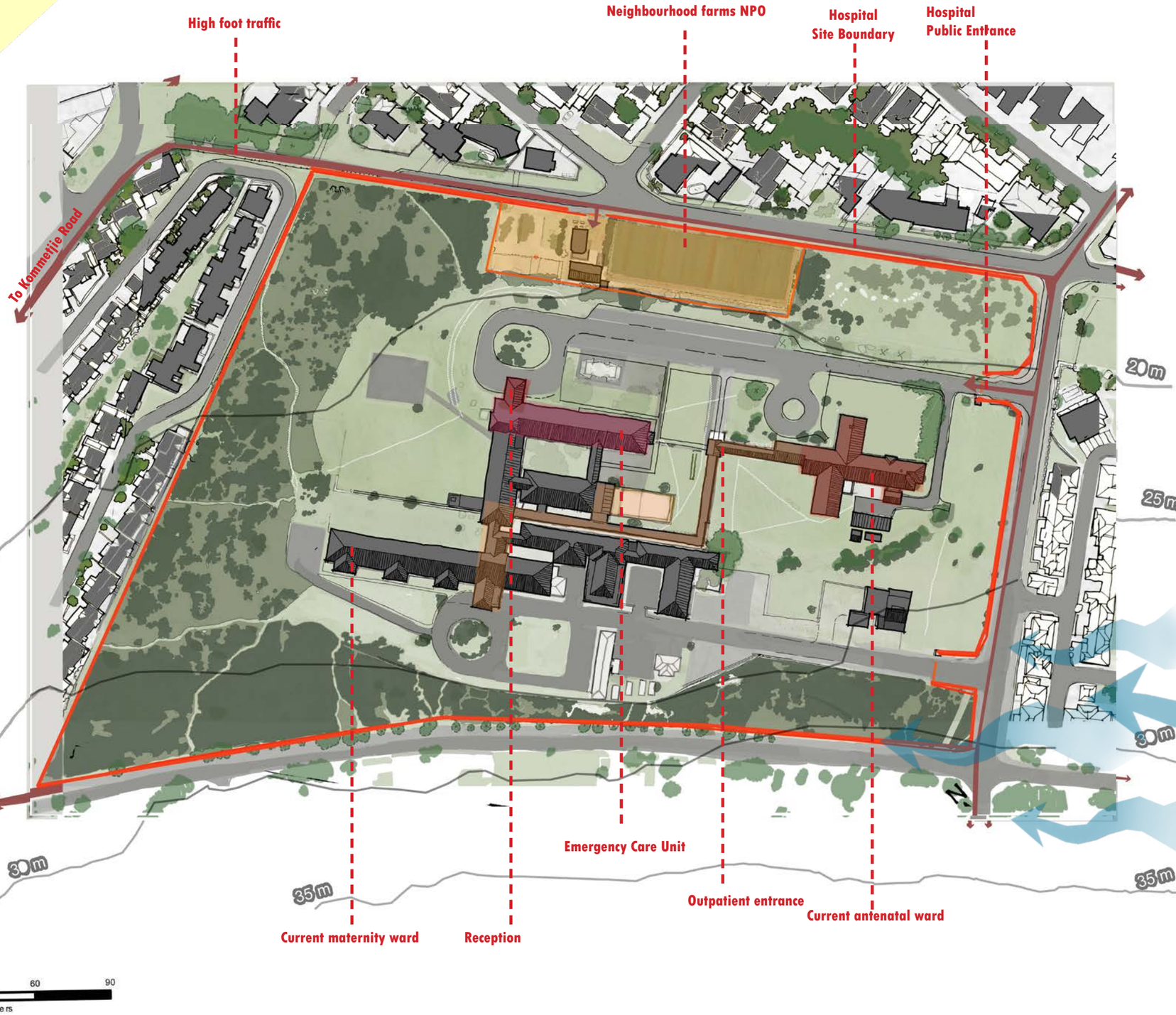
This site was selected for the following reasons:

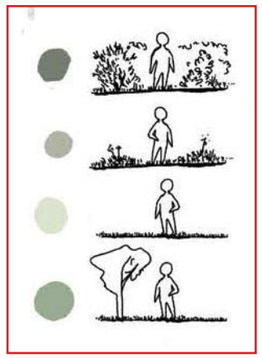
This site is accessible via public transport from Kommetjie Road two blocks away, and is surrounded by well-used pedestrian routes with heavy foot traffic throughout the day. The hospital allows an NPO called Neighbourhood Farms to occupy the north-east edge of the site. They accommodate a number of public and participatory amenities such as an urban farm, indigenous nursery and produce shop.

The site also has many degrees of privacy – from the farm on the north edge, to the semi-private hospital grounds with gated access and qui-et, private roads, to the private swathes of unused fields surrounded by thick, indigenous vegetation. This has the potential to create an urban proposal that allows people to access it discreetly via hospital roads, or to interact with the more vibrant public edge.

There is a variety of vegetation types: there are regularly-mown lawns, waist and shoulder-height ‘fields’ of Fynbos, a handful of mature trees and an infiltration of invasive wattle species.

On the next page are diagrams showing a figure ground, the hospital perimeter, the vegetation and movement routes.





Vegetation Height Key

Figure 50

This plan indicates where these views were taken.

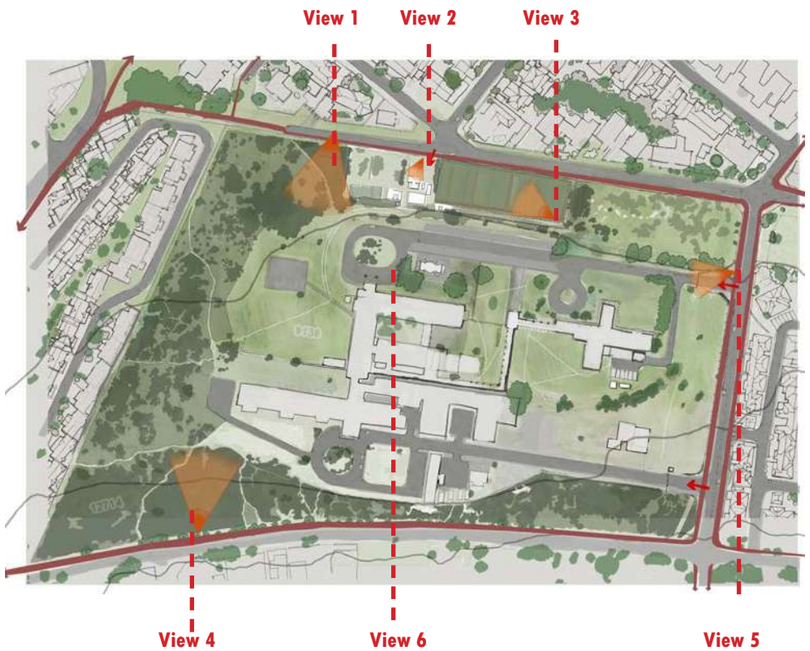


Figure 51

The views below are of the public street entrance and the main building entrance, respectively.

The Life of the Site: Character

I grew up a 15-minute drive from the site, and have family and friends who have visited the hospital as patients and worked there as doctors. Informal conversations and anecdotes indicate to me that the hospital is a well-liked and well-utilized by a diverse range of individuals from all walks of life and communities.

The hospital building itself is not one that is especially efficient or inclusive, nor is it conducive to healing. It was built during apartheid, and crystallizes a number of deeply problematic attitudes and beliefs. Segregated bathrooms and entrances have been hidden and re-purposed into spaces for storage or delivery, but the staff members who use them know *exactly* what those vestigial doors and bathrooms once were.

I was not granted permission to photograph the hospital or see the building plans, but I was given an extensive tour of the different departments and introduced to a number of staff members who were incredibly friendly and helpful.

Figure 55 & 56

The views from inside the hospital grounds and the neighbourhood farm are strikingly beautiful. In every direction is a view of a stunning mountain range, in many cases foregrounded by the lush vegetation that occupies the site.

Figure 57

Neighbourhood Farms' veggie patch under a large shadecloth

Figure 58

The cobbled-together organic produce shop and cafe with neatly-laid brick paths and carefully manicured planters of indigenous bush, all labeled.

Stakeholders on the Site

Visits to site reveal some new stakeholders. The staff and patients of False Bay Hospital, the Neighbourhood Farms non-profit veggie garden and the associated cluster of cafes and plant nurseries, and the neighbouring residents of Fish Hoek. When it comes to the existing site (which is currently unused), each group has a set of wants and needs, and ways that they can benefit from the proposed building.

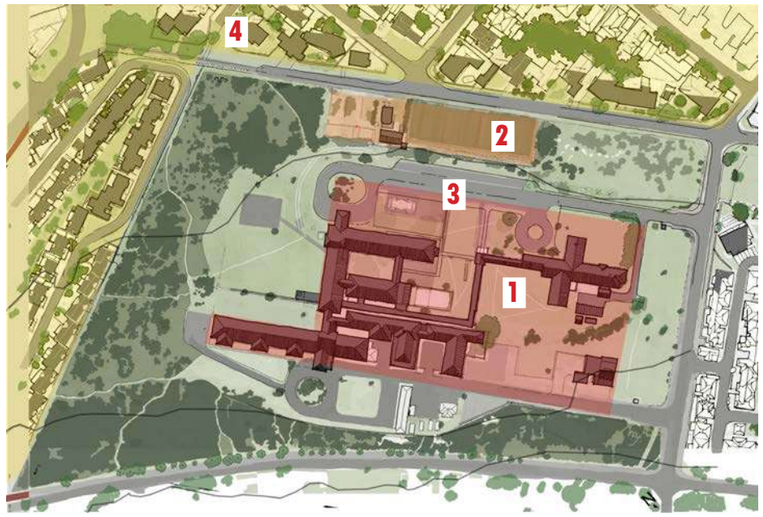


Figure 59

Plan showing the locations of the various site-based stakeholders.

1. False Bay Hospital staff could benefit from the implementation of an addictions treatment centre. In addition to immediately taking some patients from the hospital's makeshift/unofficial/unequipt psychiatric facility, the exorbitant number of drug and alcohol-related emergencies in the surrounding areas could be greatly reduced.

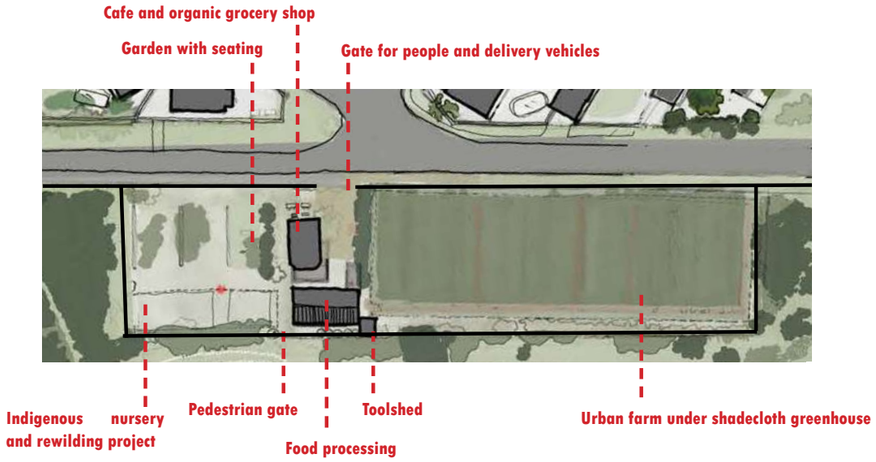


Figure 60

The Neighbourhood Farm cluster

2 . The Neighbourhood farms NPO thrives on community participation. The treatment centre can also provide a pool of people who could be upskilled and employed at the farm. The neighbourhood farm has upskilled 40 people from Masi so far, and has 4 permanent employees. (cite)

3 . Pedestrians and hospital patients who are from the surrounding catchment area of the hospital could benefit from being made aware that this place exists and is accessible to them if they or their loved ones need it one day (or currently need it). A welcoming place that has spaces for outreach and education about addiction could also be beneficial to anyone who may be at risk of developing an addiction.

4. Neighbouring residents of Fish Hoek currently benefit from a view of the lush vegetation on the hospital grounds. One can easily assume that they would be more well-disposed toward this new building if it somehow preserved thair view of nature.

The Life of the Site: Ecology

Another element that could be considered a ‘stakeholder’ is the ecological life of the site.- South Peninsula Granite Fynbos - the historical covering of the site - is endemic to Cape Town, and currently critically endangered. On the City of Cape Town map of ‘Indigenous vegetation - current extent’, the patch around False Bay Hospital (identified by the ‘H’ symbol on the map) is classified as non-existant, but according to google earth imagery of the site when the hospital was built, it was never completely removed - a patch on the steep slope directly behind the hospital remained untouched.

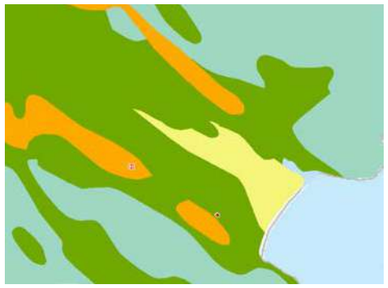
Although the rest of the site was cleared and mown for many decades between the 1980s and the 2000s, much of it has since been allowed to revert to its natural state. It is however currently infiltrated by a number of invasive wattle species, which can easily be removed in order to catalyse the regeneration of this patch of precious ecology.

Historically and in the present day, wild fynbos is often overlooked as ‘bushes’, or ‘bosjes’ and landscapes such as this one dismissed as a neglected, overgrown leftover ground of non-descript weeds (Sittert, 2002). In reality, when one walks through these forgotten patches and observes, it becomes apparent that they not only hold a of endemic and beautiful flora and fauna, but they are teaming with life that has the potential to strengthen this fragile ecosystem if they are looked after and protected. (source)

The flora and fauna of the site: the hospital’s current relationship with nature is for the most part one of indifference and some appreciation of the views and beauty of the surrounding mountains. Brief informal interactions with staff members of the hospital indicated that the more wild and woolly parts of the grounds were unused and seldom visited by anyone. Once a month a private company would mow the grass, and in summer the doctors occasionally had lunch on the lawns. (Dixon, 2023)

Indigenous Vegetation- Historic Extent

61.



Indigenous Vegetation- Current Extent

62.

Peninsula Granite Fynbos
Hangklip Sand Fynbos
Peninsula Sandstone Fynbos
Cape Flats Dune Strandveld

63.

1958 (Before construction of hospital)

64.

1968 (After construction of hospital)

65.

2023

A Material Connection to Landscape

Figure 66

Port Jackson Willow, or *Acacia Saligna*

This technical study expands on the idea of 'reciprocity' and forming relationships between people, their building and their immediate environment. I believe that an essential character to be considered as part of this immediate environment the ecological health and biodiversity of the site itself. In order for people to form a relationship with the landscape, there must be a give and take in which the plant and animal life of the land also benefits.

Figure 67

Black Wattle, or *Acacia Mearnsii*

Regenerative design in architecture involves creating built environments that go beyond sustainable practices to actively restore and improve the ecological, social, and economic systems of a site. The goal is to leave a site better than it was found, enhancing its natural and human attributes rather than just minimizing negative impacts (du Plessis). The realization of this concept will be explored through a technical lens, exploring one key way in which the building can potentially improve the ecological conditions of the site and form a positive, mutually beneficial relationship between the occupants and the environment.

Invasive Wattle species are found in and around the site, including extensively invading the mountains that surround Fish Hoek and Glencairn. Invasive bush is the single biggest long-term threat to South Africa's water security and biodiversity (Henderson, 2020). as they exacerbate erosion, siltation of rivers and dams, sedimentation, reduce water quality and cause mudslides and flooding. They worsen the damage of wildfires by burning at a much higher intensity than the indigenous species.

I have participated in a handful of 'hacking' events, where volunteer groups (such as the UCT Mountain and Ski Club) visit especially infested patches of mountain to cut and uproot wattle. These are often shoestring groups with hand tools, and carrying the dead biomass down the mountain is of lesser importance, so it is often left behind. Unfortunately, the piles of drying bushes create a fire hazard as well as blocking the growth of other plants beneath them (Henderson 2020).

The Fish Hook site contains and a number of invasive wattle and pine species. Two of the most problematic invader bushes in the surrounding mountain range are Black Wattle and Port Jackson (Henderson, 2020).

My proposal is to find a structural use for these uprooted wattle trees in order to theoretically incentivise their removal from the vast swathes of land that they occupy in and around the site. There is also an opportunity to challenge their reputation of simply being waste material by using a technology that puts them on display and emphasizes their structural capabilities.

A Structural Use for Wattle

To determined what kind of structural system to investigate, I collected a number of *Acacia Saligna* and *Acacia Mearnsii specimens* from the mountains around Fish Hook and measured them to document the variations in the width and length of their trunks. These findings then. Figure 01 shows that the *Acacia Saligna* trunk is usually 400-500mm in length with a 40mm diameter, while the A*cacia Mearnsii* trunks were around 800mm with an 80mm diameter. These measurements are specific to the specimens found the area, and would vary in other locations depending on how long the patches of trees have been allowed to grow without being cleared.

Their small size and straight trunks are conducive to space trusses, space frames, geodesic domes and similar modular assemblies, as these technologies allow for long spans using short members.

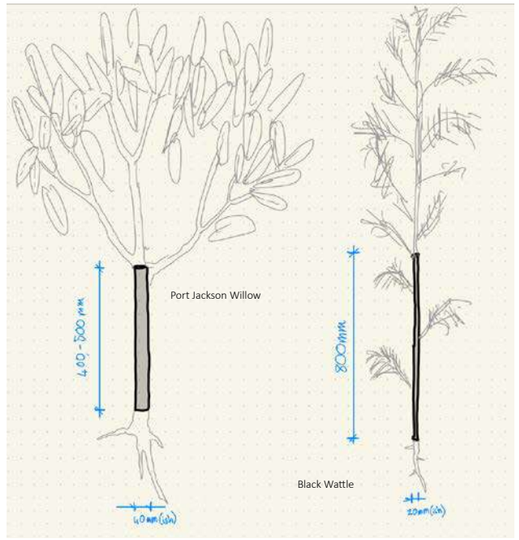
The space frame was developed in the Industrial Revolution and has been associated with 'new' technology in steel and developments in mathematical techniques from the beginning. It was first developed in 1907 and used in architecture 40 years later.

A primary advantage of space frames over other systems is it has the combination of being lightweight and having high strength. Assembly is modular, so it can be transported easily. Another way in which space frames have an advantage over the inherently planar beams and trusses in that they can rapidly distribute loads throughout the entire system via the lateral elements and diagonals (Deloney, 2021).

The two-way spanning also means that point loads are more evenly distributed throughout the entire system, rather than only distributing it to one beam/truss from the larger system. This also means that they do not have to be regular rectangle shapes as would be the case with truss or beam systems, but they can instead be irregular shapes with columns in unusual places if needed (Deloney, 2021).

68.

69.



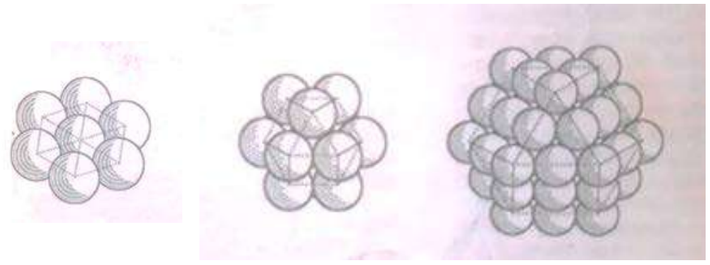
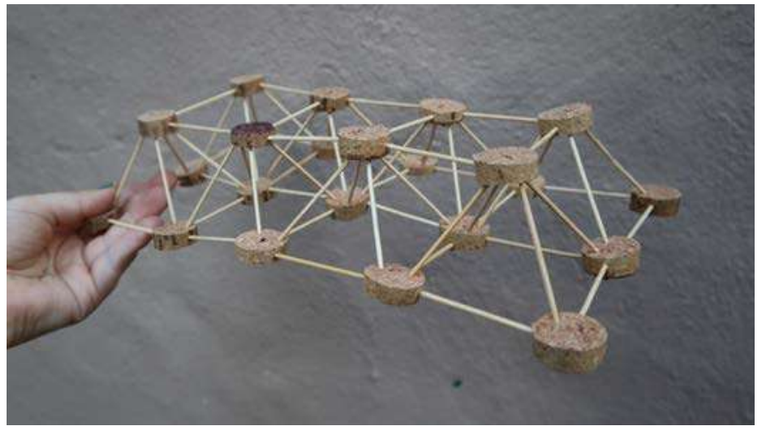


Figure 70

The geometry most commonly used in space frame design. (Image: Chilton, 2000)



71.

Case Studies

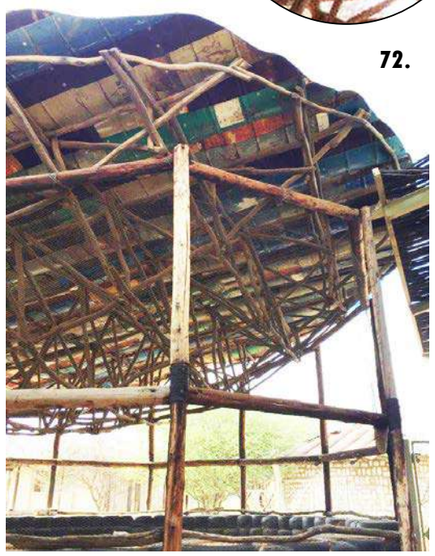
The most challenging part of this structural system is the joint. The following case studies investigate a number of variations in the joint design, ranging from simply being nailed together, to using computational technology and modeling.

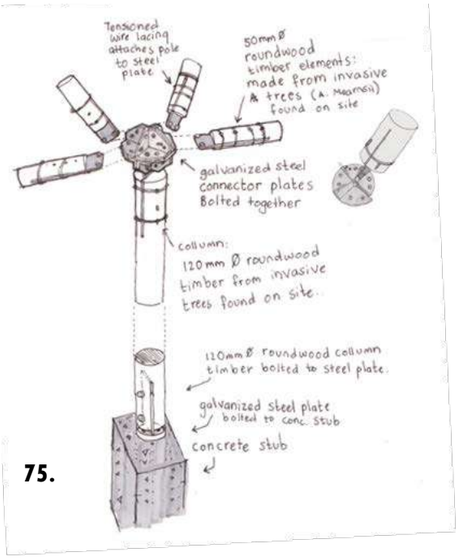
Figure X is a structure in the Habitat Resource and Development Centre in Windhoek, designed by Nina Maritz Architects. It was made from a mesquite dipped in motor oil as an insecticide and weather proofer (Maritz, N.d.). At first glance it looks like a very haphazard arrangement of sticks, they are in fact arranged very geometrically in the form of a space frame. Below is a zoomed in view of one of the joints, which is in fact eight members hammered together with nails.

A tower built by Pieter Huybers in the Netherlands. These 150-200mm diameter roundwood poles are the result of routine thinning of plantations – these small trees were removed in order to give other trees more space and light (Chilton, 2000). They have no use as structurally sawn timber, but suitably straight ones can be useful for applications such as cheap space trusses. The author also describes how round members are also more suitable than sawn timber for this purpose, as they are far stronger in bending, tension and compression as well as being less wasteful and requiring less processing (Chilton, 2000).

To quote the author, "the projects above, although small in nature, demonstrate that efficient 3D structures can be constructed from what is often considered to be at best low-grade timber and in many cases, material only fit for being reduced to wood chips or pulp. There is no reason why this form of construction should not be used for more prestigious architecture projects." (Chilton, 2000, p86)

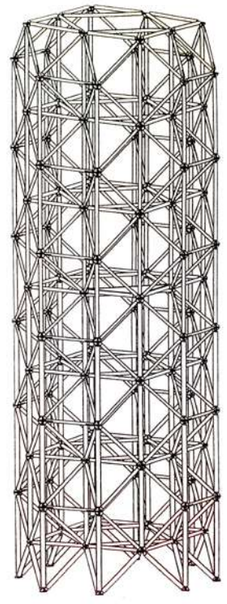
72.





75.

74.



73.

Experimental Making

This spread contains a documentation of an attempt to make a life-size joint from a cross section of offcut timber with basic wood-working tools. The resulting joint was successful in holding 9 wattle sticks securely, but was not precise enough to fit into a geometric lattice with other joints, due to the variation in shape of all of the timber elements involved.

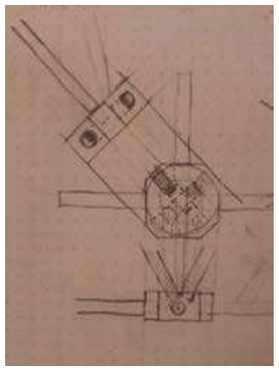
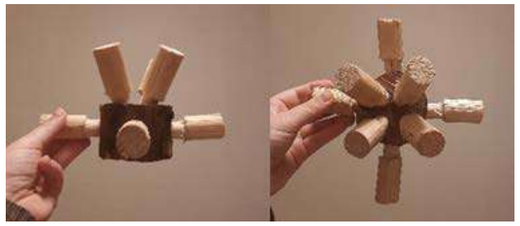
The conclusion of this experiment was that although an organic cross-section of timber may be visually appealing, one would need much more precise tools and computational modelling to make the system into something that is structurally efficient. When using sticks that are made from natural roundwood that is variable in thickness and shape, it may be more efficient to use joints that are more standardised and do not add their own ideosncrasies to the structure's geometry. This will reduce the amount of variability that must be taken into account when the system is designed.

This experiment did not produce a useable final product, but the process uncovered some useful clues as to how it could ultimately be done.









Part Five: Stakeholders and Brief

- **Client Brief**
- **Patient Needs**
- **Family Needs**
- **Staff Needs**

The Needs of the Client

There are currently 29 registered inpatient addiction treatment facilities in the Western Cape. The three facilities (Jackman, 2014) that receive funding from the department of social development follow a set program of 9 weeks, and the fees are determined on a sliding scale and depend on the person's financial situation. (Goosen, 2015). As shown in the contextualizing part of the paper, there are currently no funded inpatient facilities in the south of Cape Town, despite enormous demand.

This project is operating in a hypothetical situation in which the department of social development has agreed to fund the construction of a much-needed addiction treatment facility to accomodate communities in the South of Cape Town. To determine the most appropriate size, I interviewed Zandre Finkelstein, who has been involved in the management of Crescent Clinic. He mentioned that in order to make a facility financially viable, it needs to have at least 35 beds to make the fixed costs worth it. In this hypothetical situation, the department of social development are proposing a facility with 40 beds. They are collaborating with the NPO on he chosen site - Neighbourhood Farms to create a community space that attaches to the outside of the facility and hosts outreach and education events.

The Department of Social Development requires a facility that successsfully treats people as efficiently as possible. According to the *National Dept. of Social Development Minimum Norms and Standards for Inpatient Treatment Centres,* a document that can be found on the DSD website, the primary requirements are as follows:

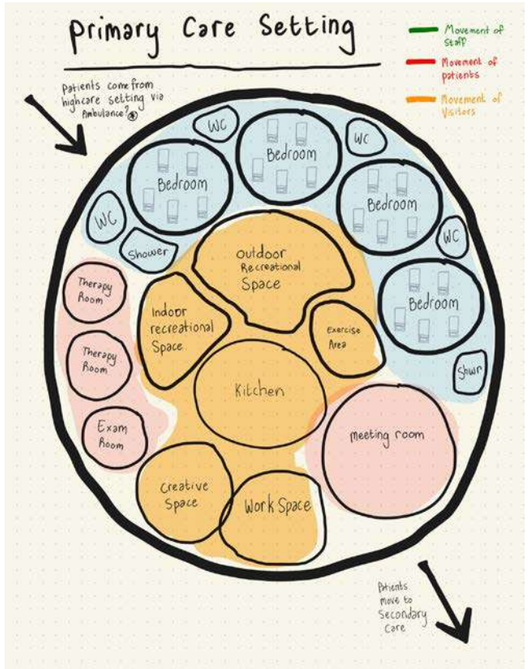
1. The environment is safe, alcohol and drug free, supportive of adequate residential care and treatment.

2. The amenities comply with statutory health and safety requirements, environmental health requirements and fire regulations.

3. The location is designated by a local authority to be solely a treatment service.

To gain insight into the quantitative client needs, this paper synthesizes information from the *National Dept. of Social Development Minimum Norms and Standards for Inpatient Treatment Centres*, as well as, who describes what is currently available to people who cannot afford private treatment. To understand the needs of the staff, I interviewed Dominique McClou and Imraan Muscat, clinical social workers from Crescent Clinic.

The document goes on to describe the requirements of the facility's physical environment, which is briefly summarised alongside in a visual form. Building on the minimum requirements set out by the government, I interviewed Dr. Rodger Meyer, an individual who has been involved in running a number of addiction treatment facilities.



80.

The Needs of the Patient

The sequence of events that lead up to an individual staying in an addiction treatment facility are as follows:

1. The individual seeks help, or their family makes them seek help, or they wake up in hospital after an overdose.

2. They are evaluated by a social worker, who decides whether they can be managed within the community using ‘community-based care’, or whether they must attend regular meetings in an outpatient facility, or whether they require treatment in an inpatient facility.

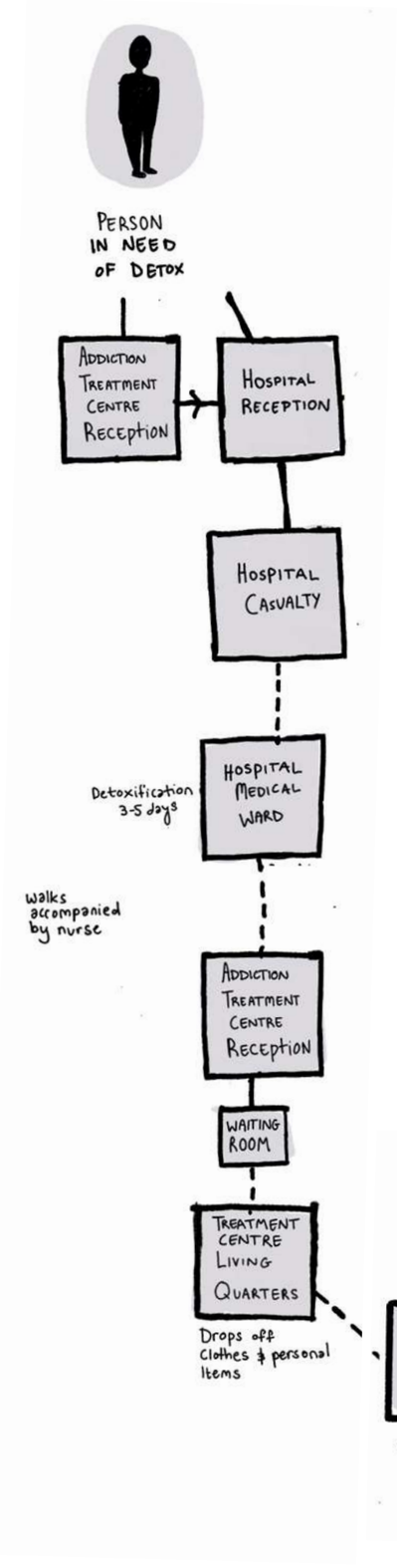
3. If the individual is in severe withdrawal that requires medical attention and supervision, they are kept in a highcare setting (such as False Bay Hospital) for a few days. Alcohol withdrawal can be deadly, and often needs to be managed with medication.

4. The individual is discharged from the highcare unit and sent to the primary care facility, where they begin treatment. In the public sector, there is a standardized 9-week program at a facility, where individuals learn how to confront their problem, receive education about the problem and are then equipped with the tools and resources needed to lead a sustainable life without substances. This involves one-on-one therapy, group therapy, written work and re-learning to socialize. This phase suitable levels of supervison, access control, security and boundaries. After this, individuals are sent home, but encouraged to participate in community-based aftercare (Goosen,).

The user has different needs in the three different phases of addiction treatment. Patients in a primary care facility are under a lot of stress and are facing the world anew. They need to be comfortable (Meyer, 2023). The rules and regulations are an important part of this phase of treatment, as this helps to re-socialize people and instill a sense of boundaries, accountability and respect for others (Meyer, 2023).

According to Dr Rodger Meyer, the needs of a client in the later phases of addiction treatment involves reintegration and acclimatization to the outside world. In this section, family therapy is introduced, and the individual is required to face the difficulties in their lives and set goals for themselves, such as finding a job or a place to live after treatment. He mentions that triggers are not to be avoided in this phase of treatment, as patients are preparing to re-enter the outside world and face the challenges that come with that. This means that interpersonal conflict among peers is treated as an opportunity for people to learn to resolve their differences (Meyer, 2023). If they do not begin to set goals and incentives for leaving, they risk becoming institutionalized.

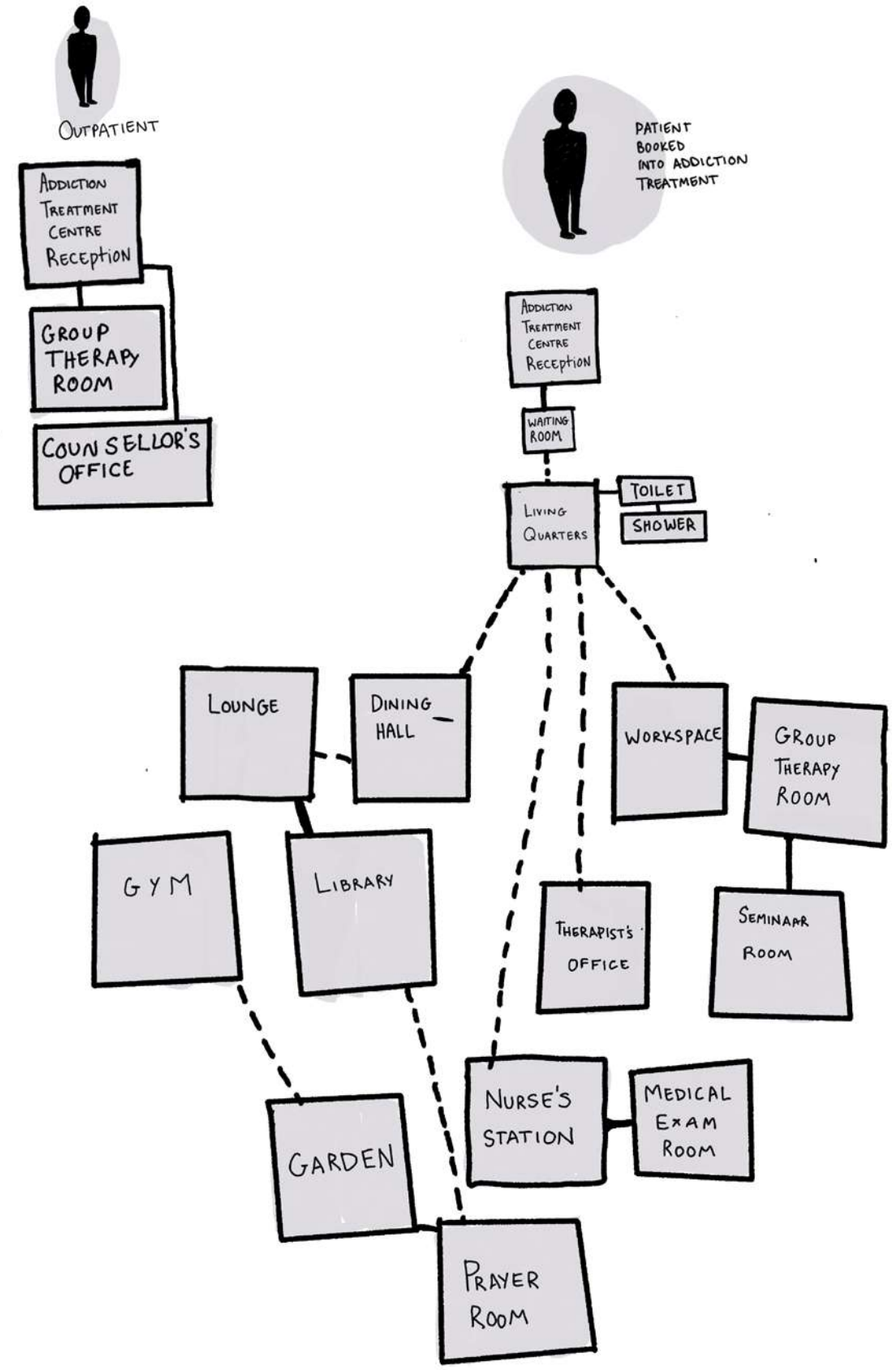
An important factor that needs more consideration in all phases of addiction treatment is re-socialization cultivation interpersonal connections. A multitude of psychiatrists, researchers and recovered addicts have emphasized the importance of re-socialization as a vital part of recovery, and citing this group-community aspect as one of the fundamental advantages of inpatient treatment over any



other kind of addiction treatment (Meyer, 2023). According to him, addiction is a shame-based problem - people do things they are ashamed of, which causes them to use more substances, which makes them do more things that cause shame. The only way to break this cycle is disclosure - treating the shame by telling people about the shameful behaviour in the context of a group setting. People often make very strong friendships in these facilities, and the sense of community is a powerful component of 'rehab' (Meyer, 2023).

The social isolation experienced by people visiting a treatment facility is exacerbated by the fact that many people seeking treatment for addiction are leaving behind a social milieu of other substance users who may not respect or support their decision to stop drinking or drugs. Often the most powerful effect a rehabilitation program can have is bringing together people who are going through the same thing and can support each other's progress. (Meyer, 2023)

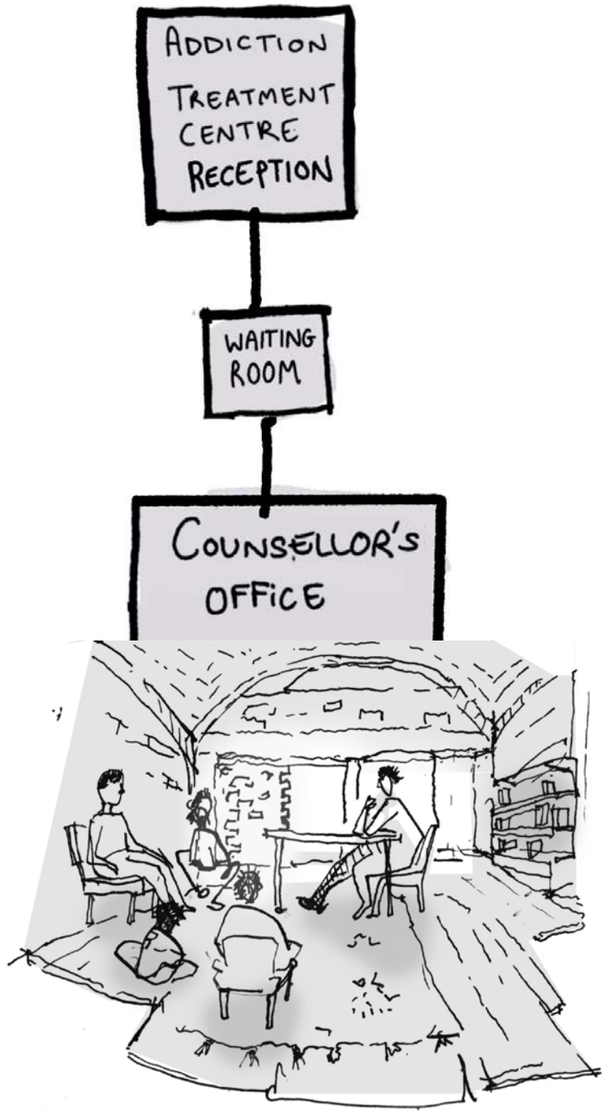
Dr. Meyer emphasizes that the thing that will sustain a successful recovery is not necessarily all about abstinence, but about a change in behaviour and lifestyle. This means introducing elements of responsibility and good habits into people's lives in addiction treatment, which is often things as simple as emptying one's ashtrays and washing one's teacups.



Secondary user group: Family

As mentioned before, the family of an addict are often deeply invested in the outcomes of the treatment. In many cases, the family and the patient will have group sessions together in order to help manage any underlying issues that may be causing or enabling the addiction. They are also taught how to maintain boundaries and take care of their own needs first.

The family would make use of the main reception area and waiting room, after which they would meet with the patient in a counselor's office in the outpatient portion of the building. These are the intermediary spaces where they do not have highly restricted access, but still require a comfortable degree of privacy.

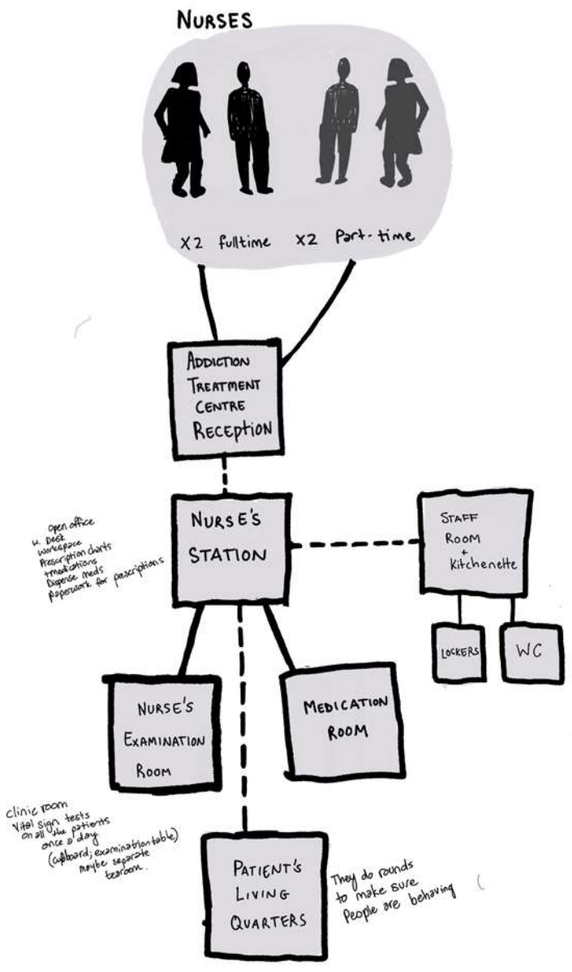


Secondary user group: Clinical Staff

The staff of the rehabilitation facility includes counsellors, social workers, psychologists, consultants, nurses and grounds staff. People who work in therapeutic fields do highly emotionally taxing work every day, and although they are trained to handle it, it still takes its toll. Accommodating the mental health and wellbeing of the staff is often overlooked in the design of rehabilitation centres.

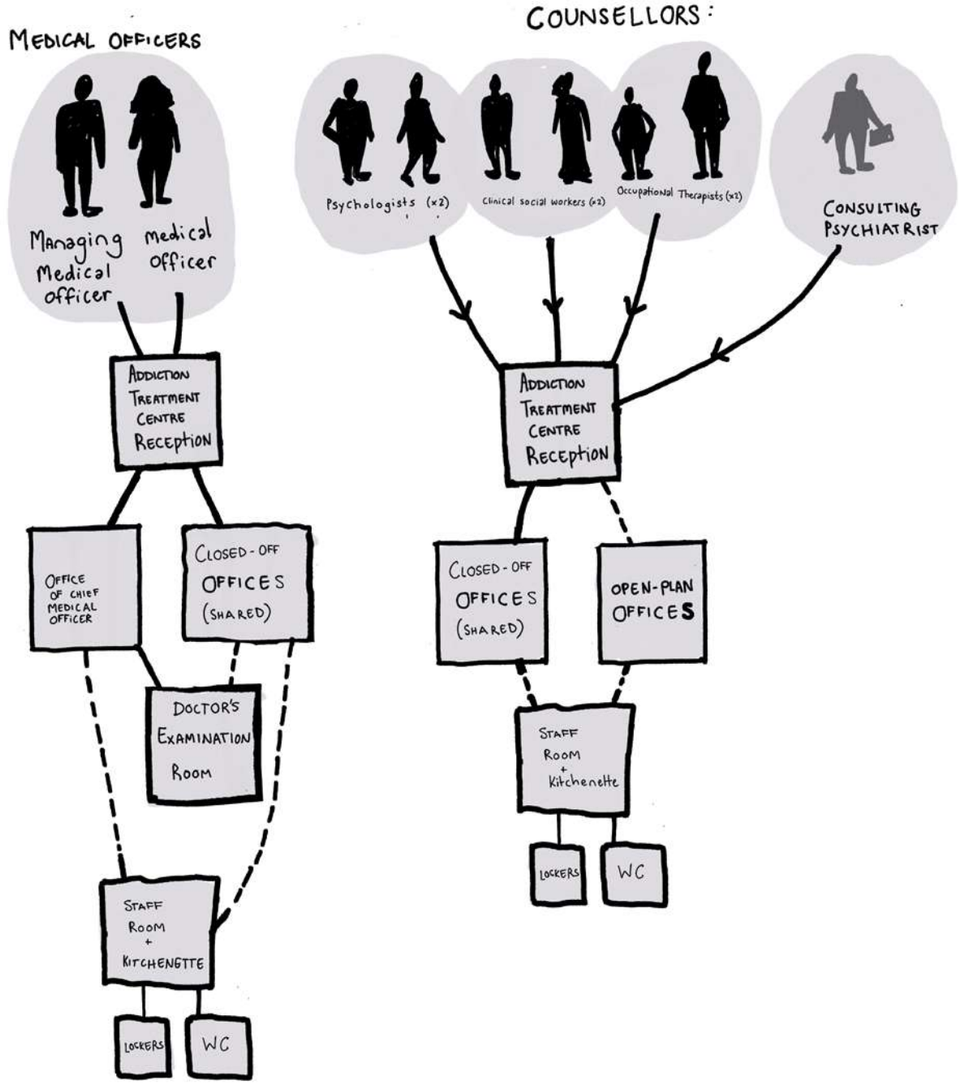
Nursing Staff

Nursing staff require a nursing station where they can dispense medication and examination rooms where people can undergo basic medical examinations. It is also wise that the more vulnerable patients (who have co-mordities or are likely to cause harm to themselves) be placed closer to the nurse's station, so that emergency situations can be handled effectively.



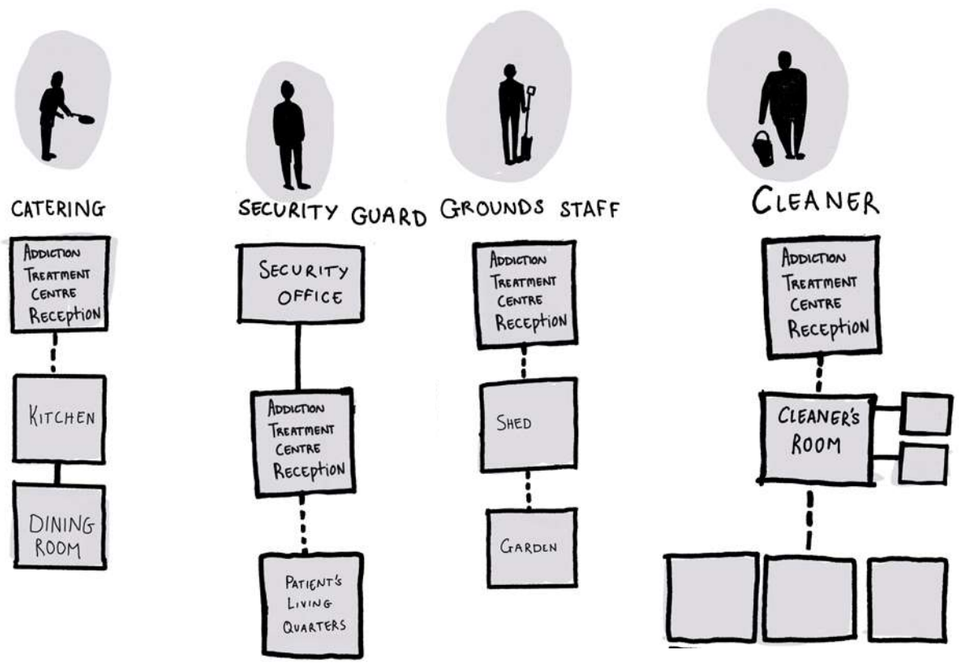
Social Workers, Counsellors, Psychologists and Consultants

As a bare minimum, these stakeholders require an office each in which to see patients one-on-one, and access to a larger room for group sessions for 10 people at a time. Dr. Meyer advises that there should also be a lecture room that can accomodate everyone in the facility at once. According to Dominique McClou, a clinical social worker for Crescent Clinic, accomodating the staff needs should also mean providing a tea room or a staff room where they can eat lunch interact with each other away from the patients, to maintain a separation. (McClou, 2023)



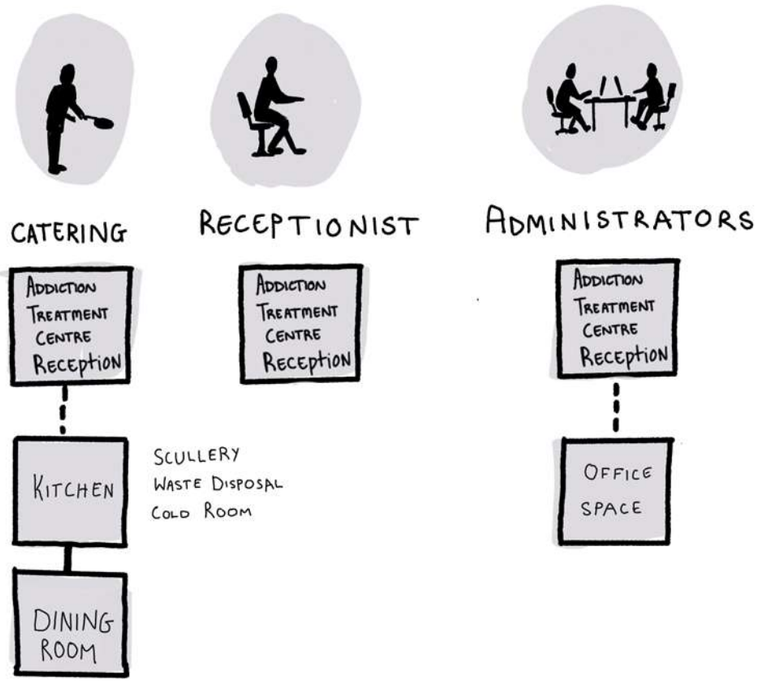
Support Staff

Gardeners, cooks, security personell and cleaners are all an integral part of the proper functioning of a facility. Their requirements include toilets, tea rooms and lockers. They would be involved in spaces such as the kitchens, store rooms, access control and gardens.



Administratative staff

Administrators include the accountants and the secretary. They would need a desk at the entrance and any other administrators would need an office.

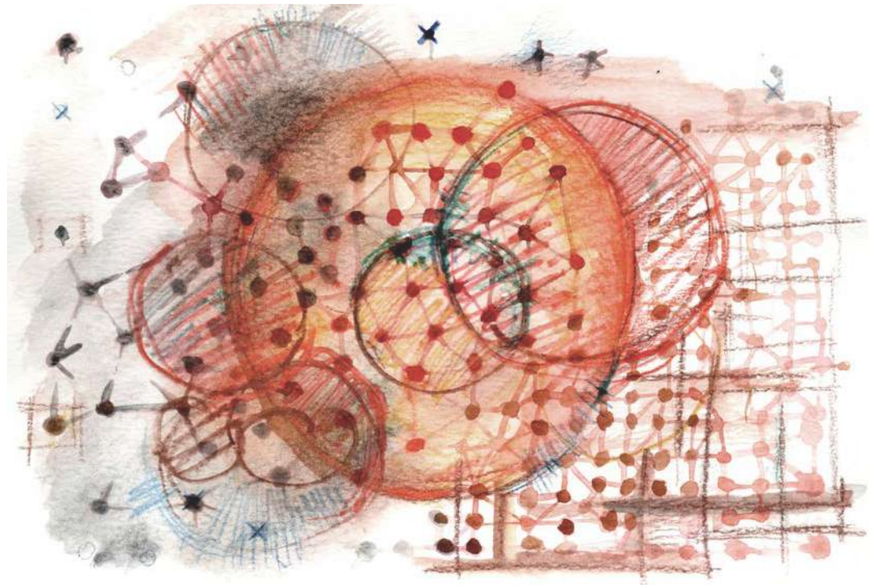


Part Six: The Design Process

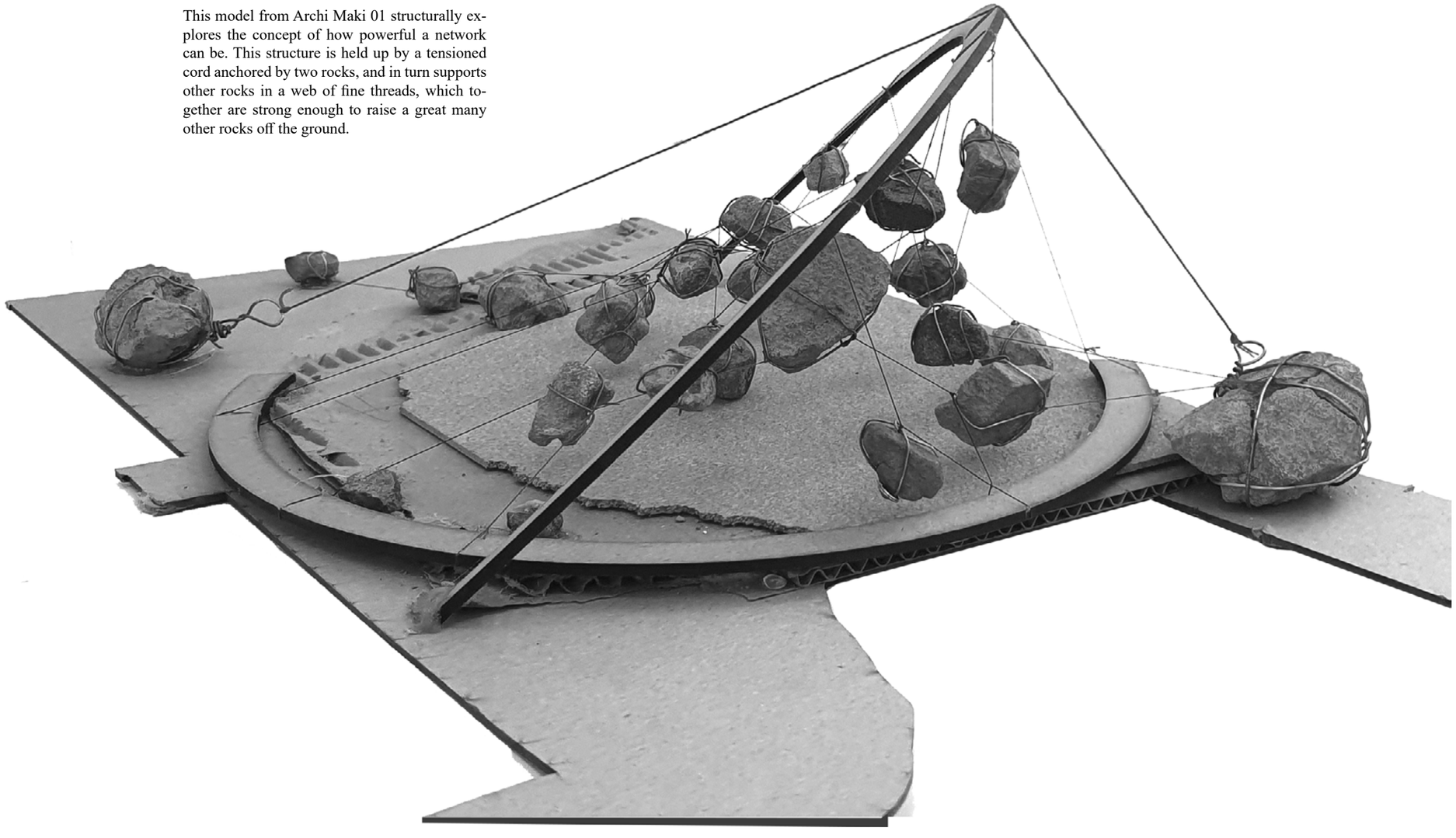
- **Archi Maki 01**
- **Archi Maki 02**
- **Archi Maki 03**
- **Archi Maki 04**
- **Landing on the Site**
- **Design Iterations**
- **Developing the Design**

ARCHI MAKI 01

This painting from Archi Maki 01 intuitively explores the idea of networks and the different strengths and shapes they form on the outskirts. The interrelationships between individuals who are accepted into society and managing to fill their role as a productive citizen are represented by the loose grid-like structure on the bottom right and the individuals who have lost connection to their support network and their purpose are represented by the unconnected dots on the left. The circles in the centre are an abstract imagining of a rehabilitation centre and the role it plays in reconnecting isolated and addicted individuals back into a support network where they can find stability and acceptance.



This model from Archi Maki 01 structurally explores the concept of how powerful a network can be. This structure is held up by a tensioned cord anchored by two rocks, and in turn supports other rocks in a web of fine threads, which together are strong enough to raise a great many other rocks off the ground.



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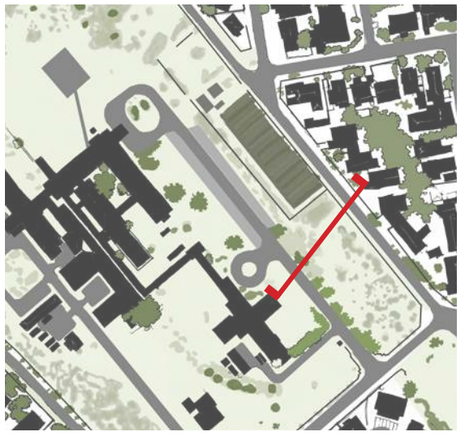


ARCHI MAKI 02

This exercise involved choosing a part of the available space in the False Bay Hospital Grounds and creating an abstract section to test how it would fit there in terms of scale, privacy and permeability.

The result of the exercise was the decision to move to a portion of the site that was to move the intervention to a part of the site that was:

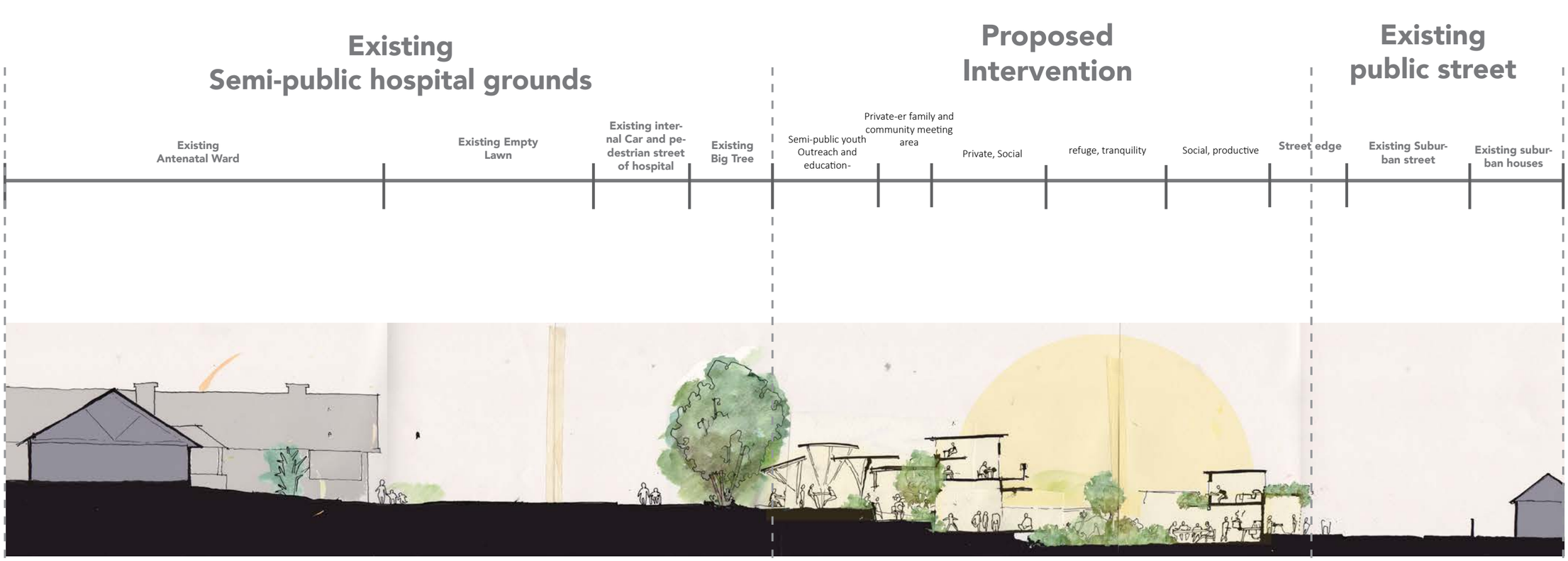
a. Less exposed to loud traffic.

b. Interfacing with pedestrian walkways rather than roadways

c. Hugged on several sides by a natural landscape, to create a privacy barrier for the protected and hidden part of the facility.

d. Creates a secure but welcoming interface between the hospital entry area and the neighbourhood farm. (there is currently no interface between the hospital and the farm.)

91.

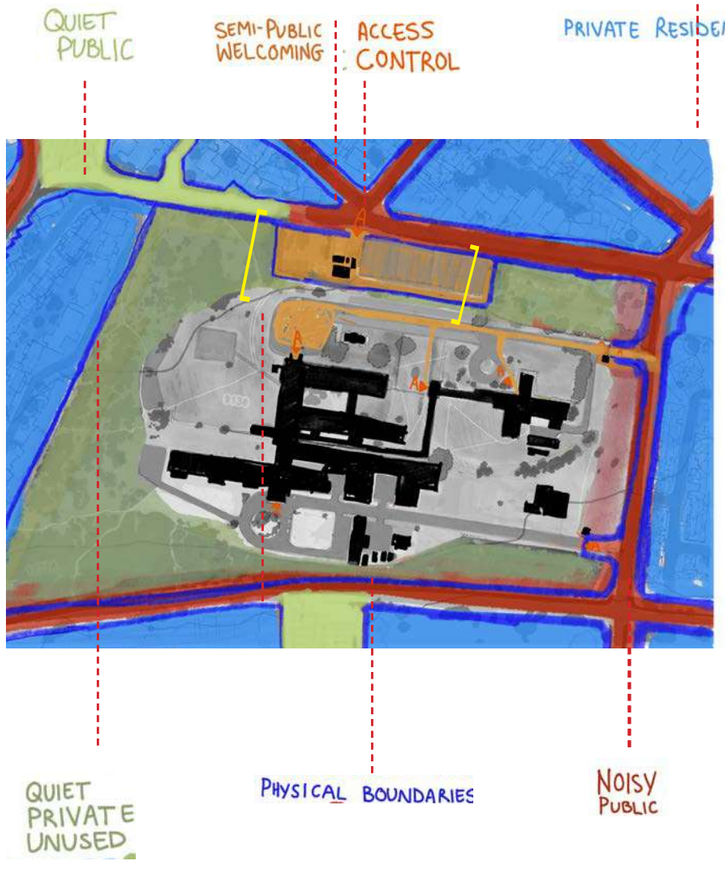


ARCHI MAKI 03

Exploring the qualitative aspects of the site.

92.

93.



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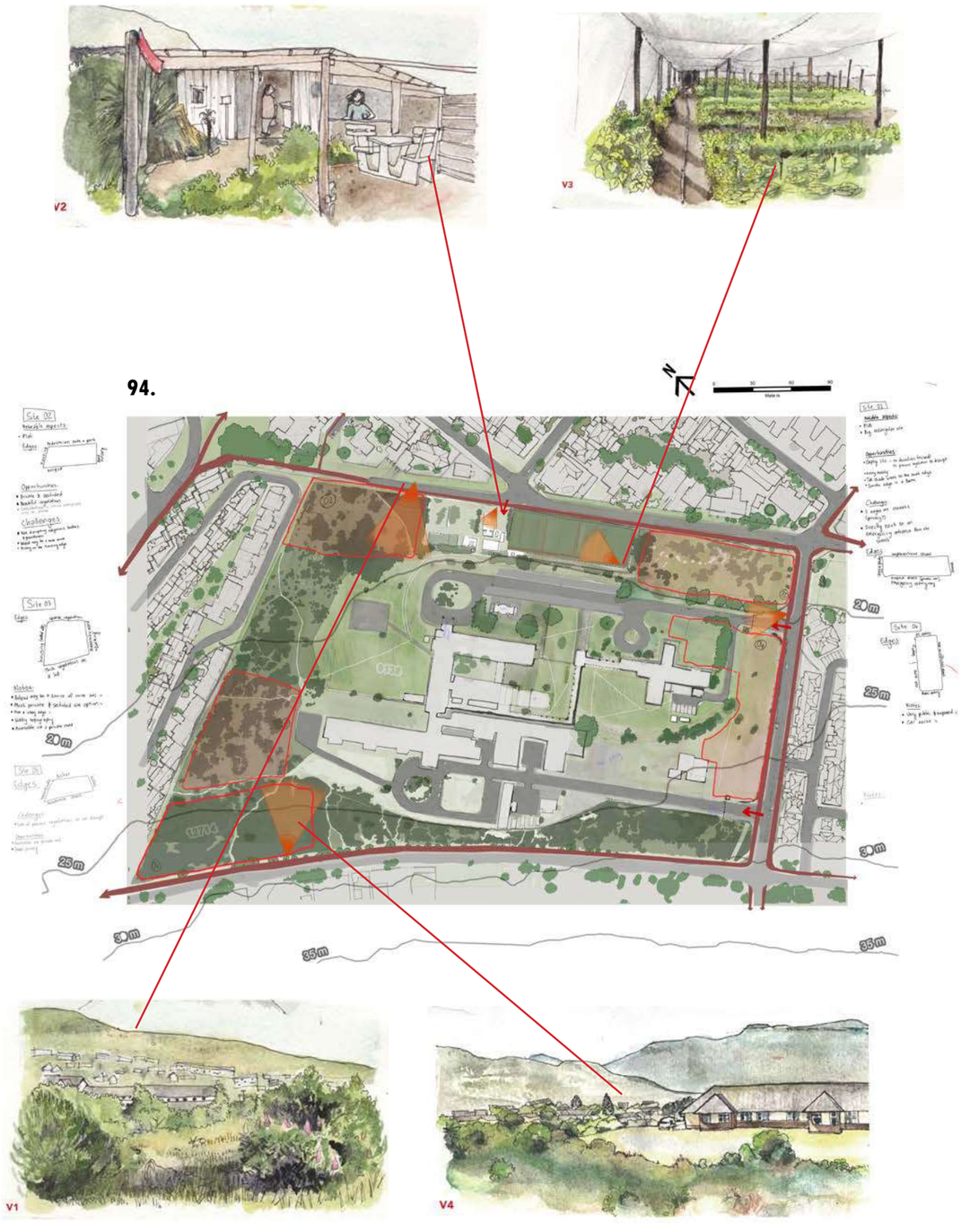
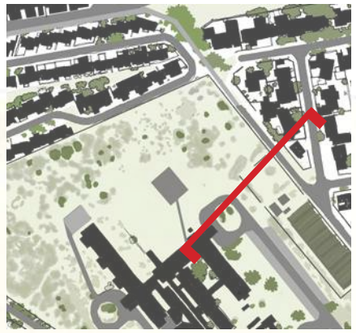


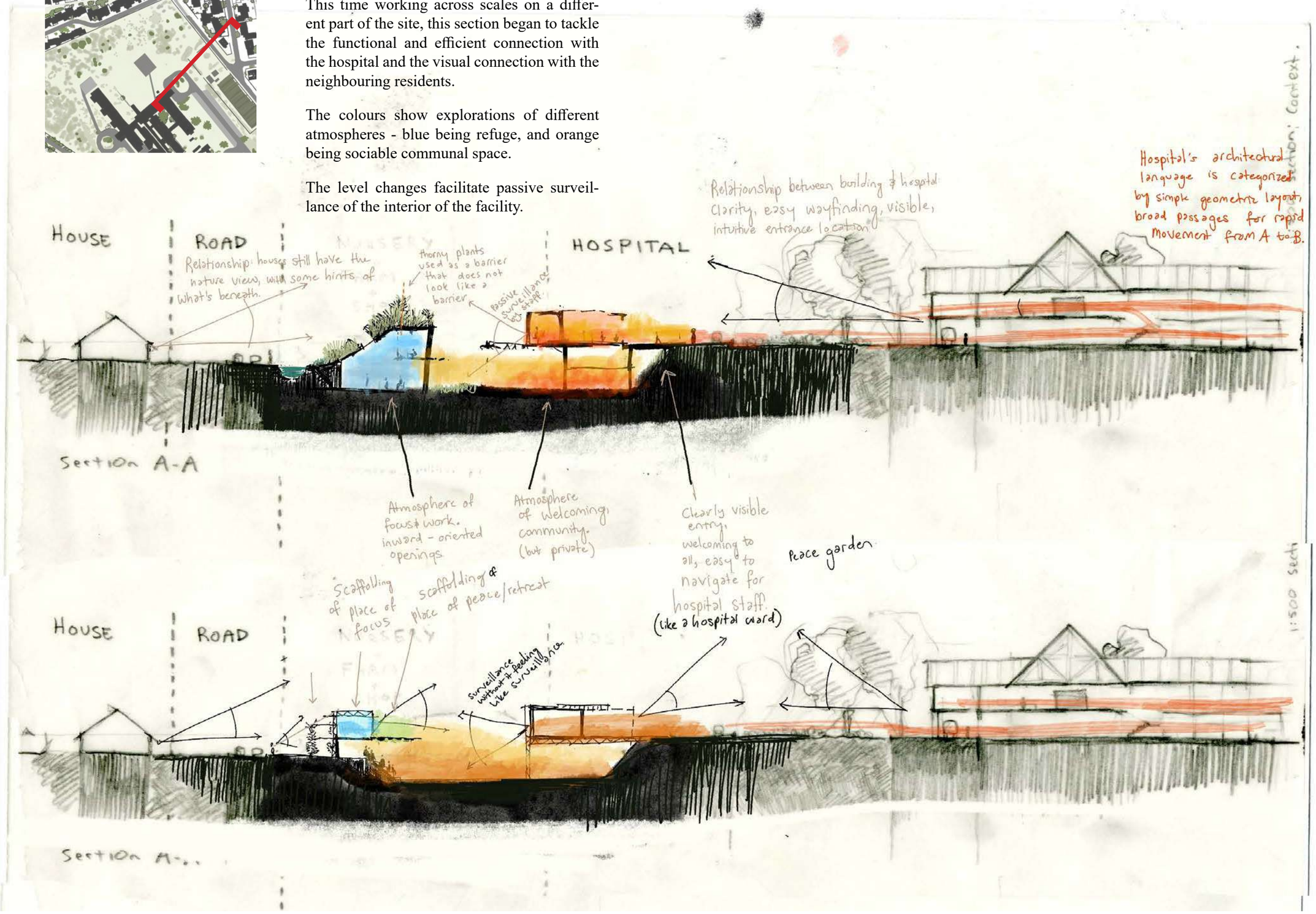


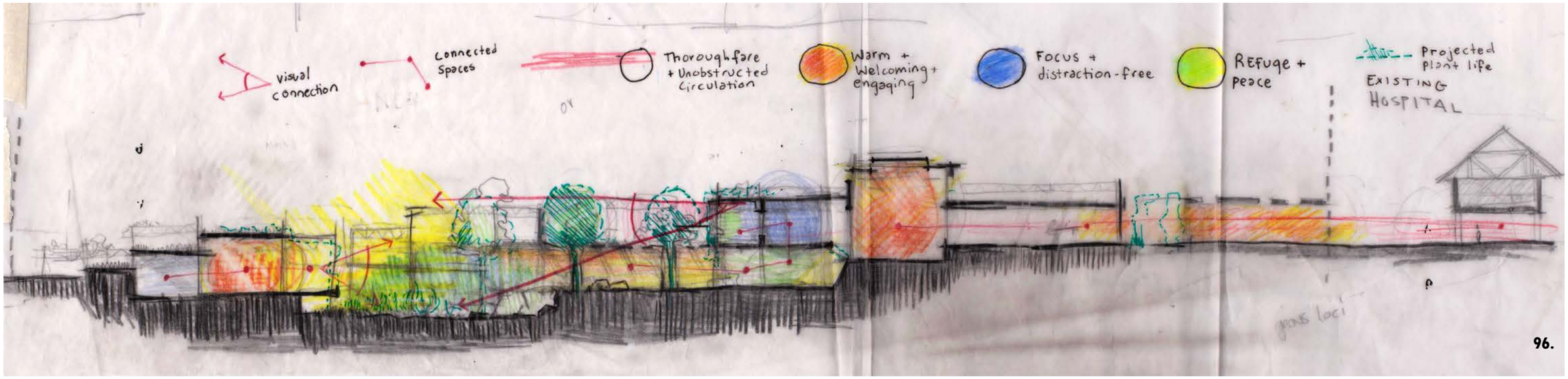
ARCHI MAKI 04

This time working across scales on a different part of the site, this section began to tackle the functional and efficient connection with the hospital and the visual connection with the neighbouring residents.

The colours show explorations of different atmospheres - blue being refuge, and orange being sociable communal space.

The level changes facilitate passive surveillance of the interior of the facility.





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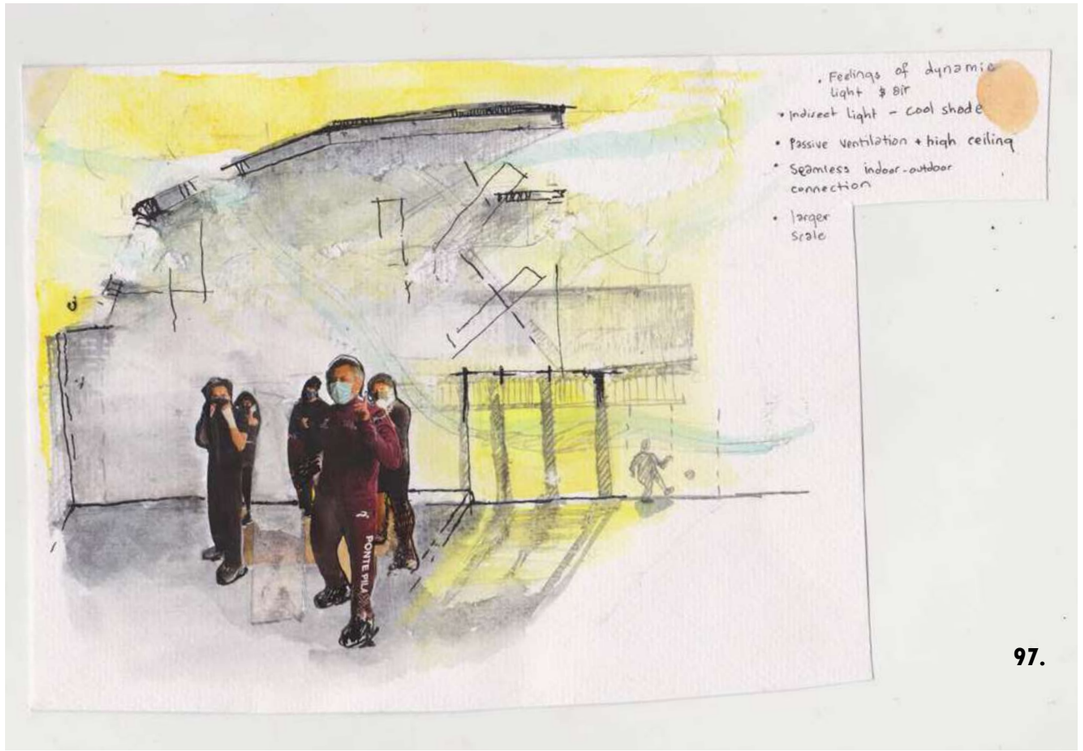

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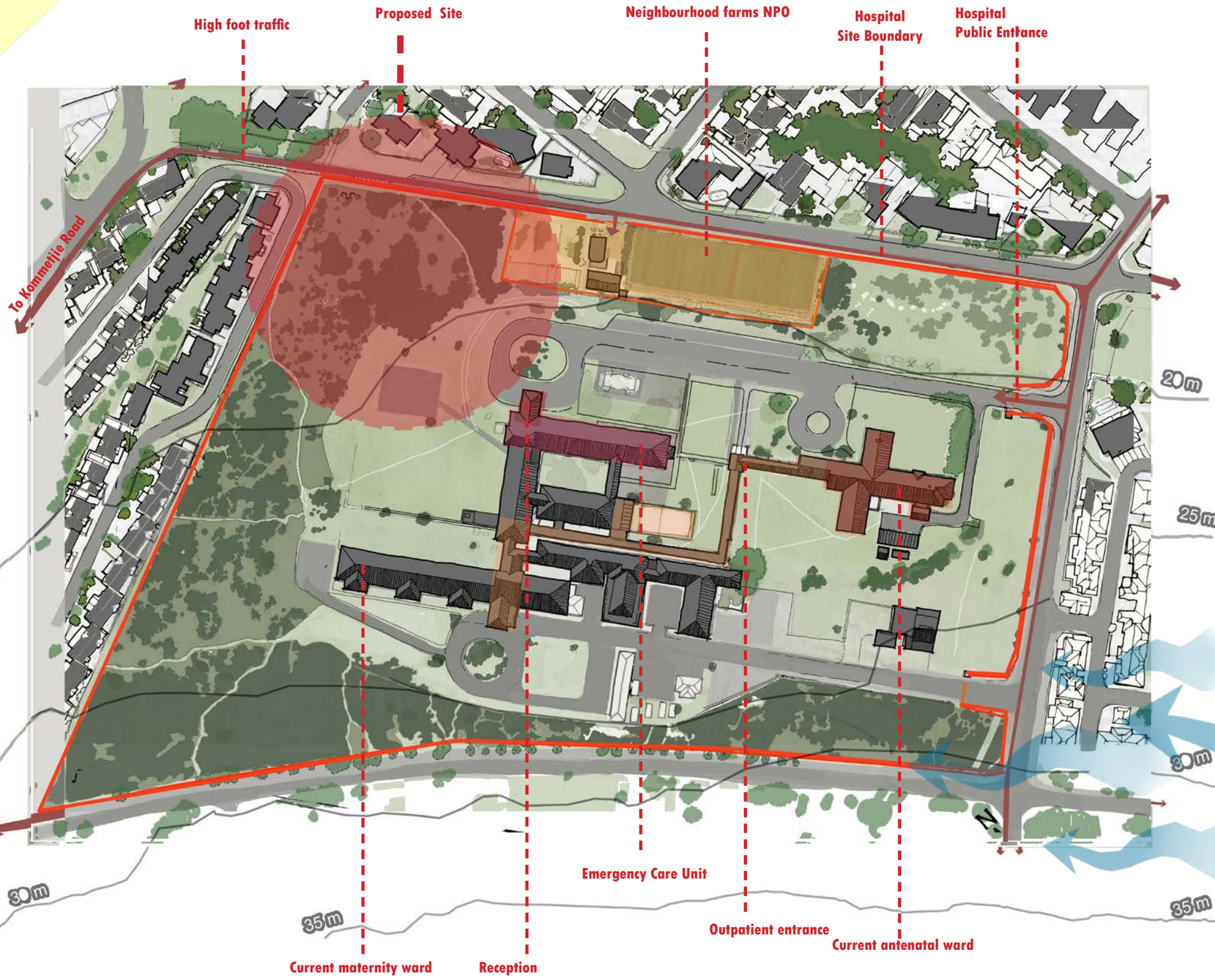
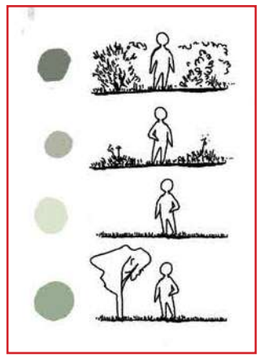
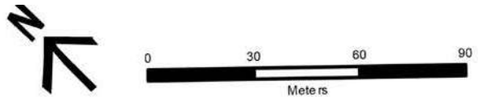
As a continuation of Archi Maki 04, this section goes into more detail about the atmospheres required in the facility, and explores scale, level changes and spatial connections.

Landing on the Site







Fences

Dead-end for cars

0 5 10 15 20

Public park

Footpath and bikepath

Proposed Site

Vegetation Height Key

Neighbourhood farms entrance

Residential Housing

Road for hospital users, staff and ambulances.

Garden where people often wait

Security checkpoint

Hospital Reception

Covid 19 testing point

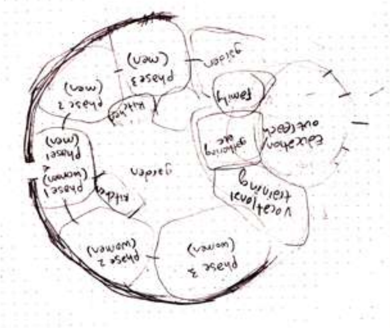
Unused Land

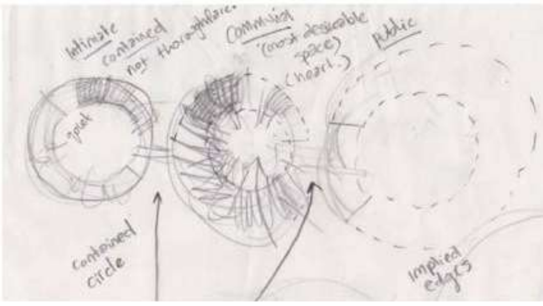
Helipad

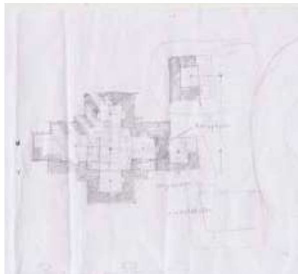
Hospital Emergency Care Unit

Thinking through drawing: Iterative Design Sketching

Adapting a courtyard system

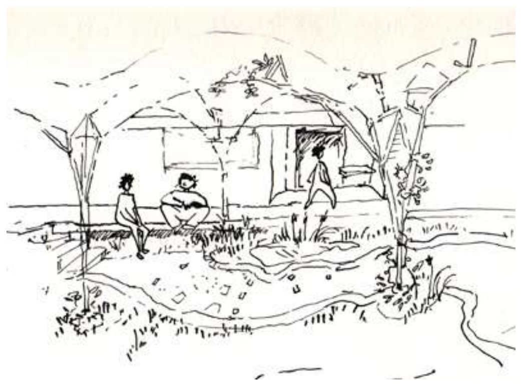


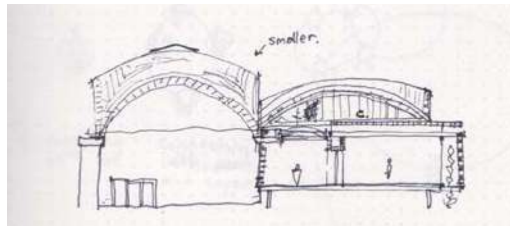


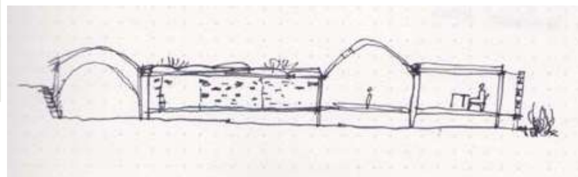


Combining square grids with spherical spaces to balance the need for efficient way-finding with the need to slow down, pause and experience certain moments that are important.

Experiential moments

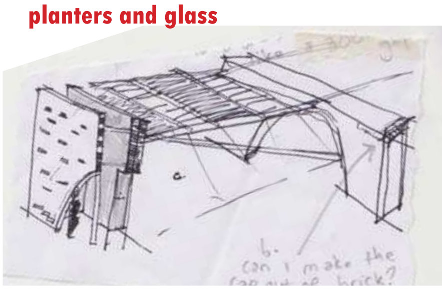




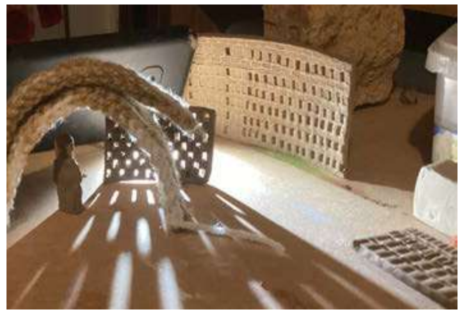


Exploring Structural Logic and Materiality

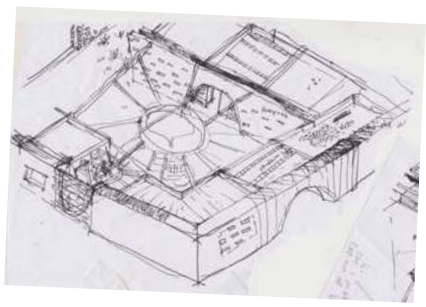
A layering of different skins, such as perforated brickwork, planters and glass



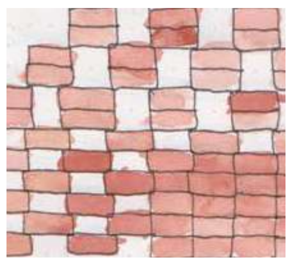
Curved forms and tactile materials create places of sensory comfort and engagement.



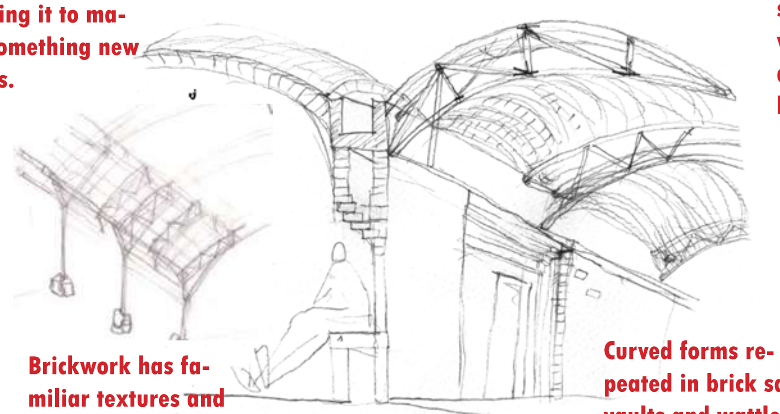
Courtyards and thick walls



Celebrating the ordinary: Using an everyday, low-cost material such as brick. Using it to manipulate sunlight, so as to create something new that is more than a sum of its parts.

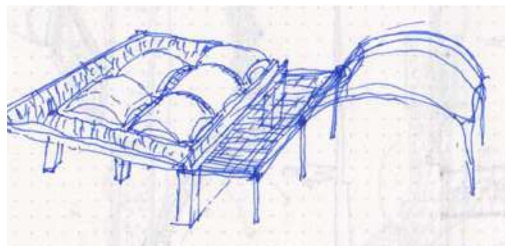


Brickwork has familiar textures and warm colours.

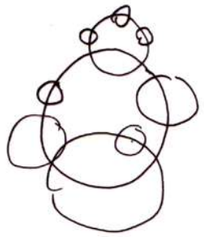


Curved forms repeated in brick sail vaults and wattle space trusses

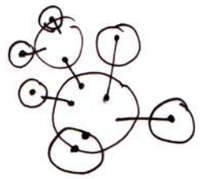
Combining square grids with spherical spaces to balance the need for efficient wayfinding with the need to slow down and experience certain moments that are human-centred.



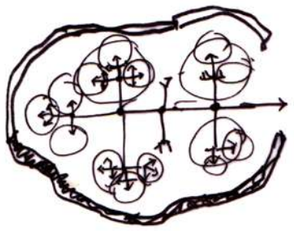
Evolution of the morphology



Conceptual imagining of the interpersonal relationships formed in treatment.

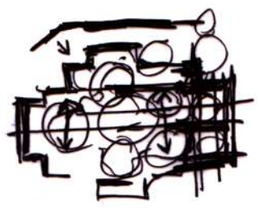


Defining the spaces where these connections happen, and their relationships.

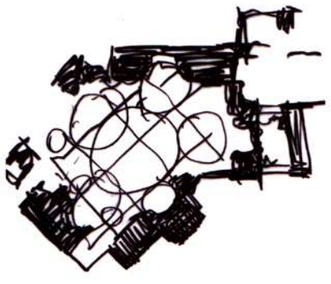


Circulation system: Centralized.

Enclosure: Perimeter secure
Courtyard typology for passive surveillance.



plugging into the linear logic of the hospital & the farm

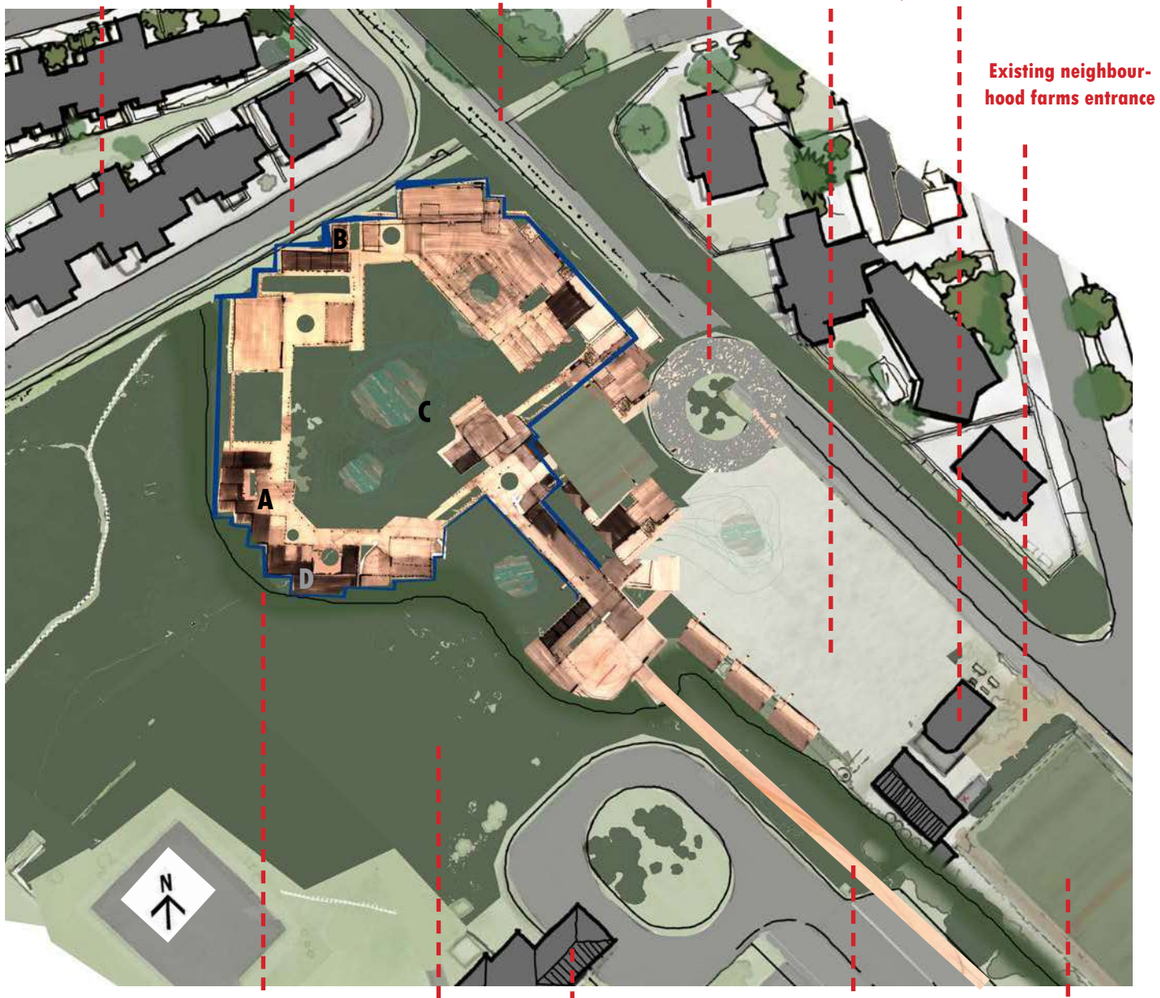


Adapting grid to follow sunlight & contours.

Carving courtyards from the Mass.

Organic + malleable
to create comfort.
Using fractals to erode the solid mass.

ITERATION 04 Site Plan

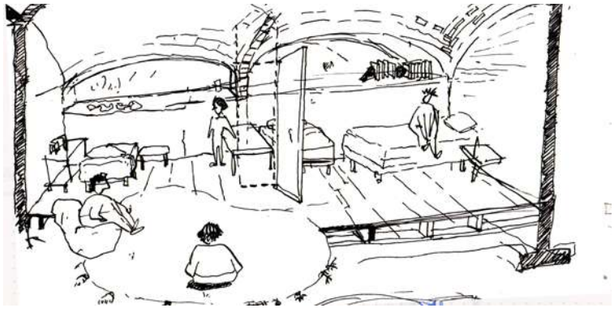


View A: Bedroom-Walkway interface

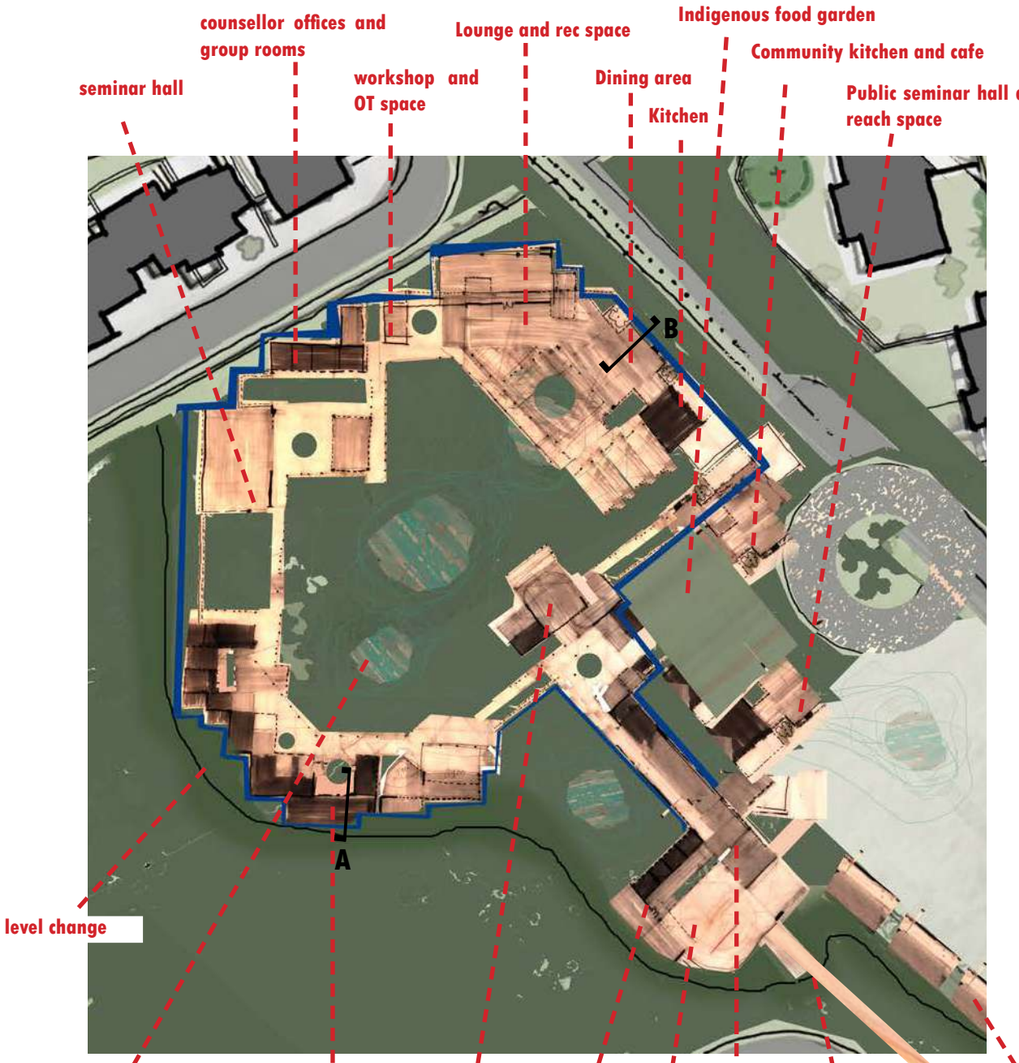
View B: Interior view of a group therapy space

View C: Constructed wetland in the interior rewilded courtyard.

Curved bruck masonry ceilings distribute light evenly and create familiar brickwork textures.



View D: Shared bedroom, looking at the nature edge

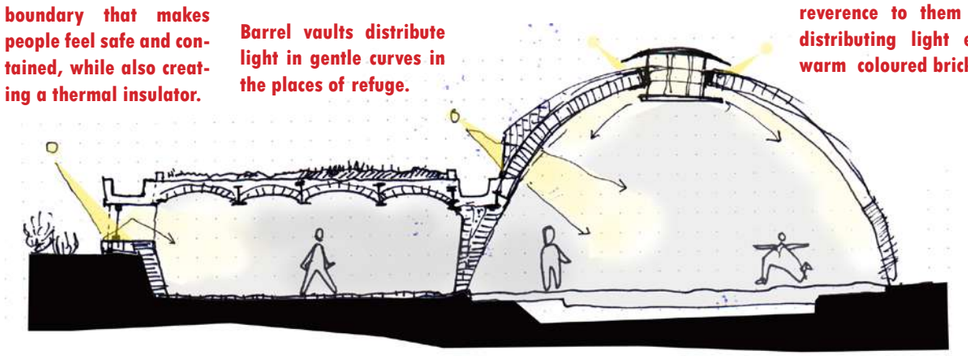


Ground Floor Plan

Thick walls to create a boundary that makes people feel safe and contained, while also creating a thermal insulator.

Barrel vaults distribute light in gentle curves in the places of refuge.

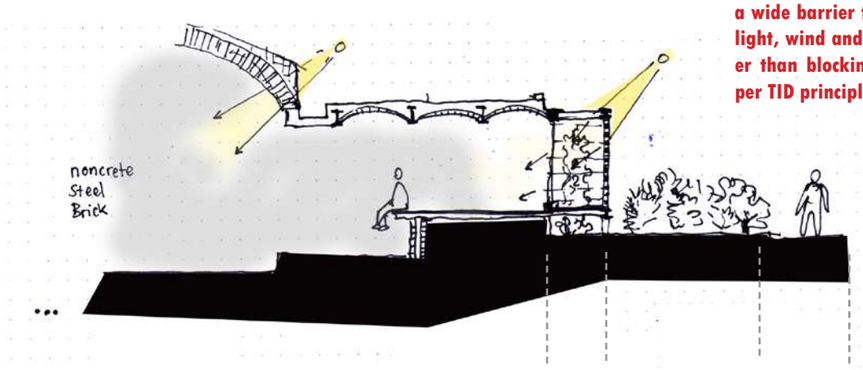
Sail Vaults over the communal spaces bring an importance and reverence to them while also distributing light evenly over warm coloured brickwork.



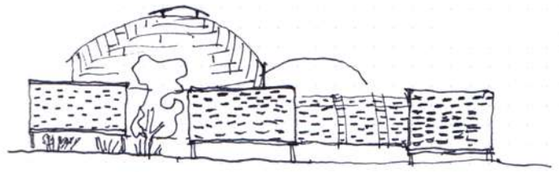
Deep window reveals create indirect daylighting of the space, and as well as obscuring any views into the private spaces.

Section A: Indigenous Landscape Edge

Layered facade of planting bed, honeycomb brickwork, planting and glass creates a wide barrier that diffuses light, wind and sound rather than blocking it out (As per TID principles)



Section B: Pedestrian Street Edge



Conceptual Street elevation

Conclusion

This research froma number of differernt angles formed the basis for the design of an inpatient addiction treatment centre that is human-centred and cultivates a sense of refuge, a sense of community and ultimately a sense of independance.

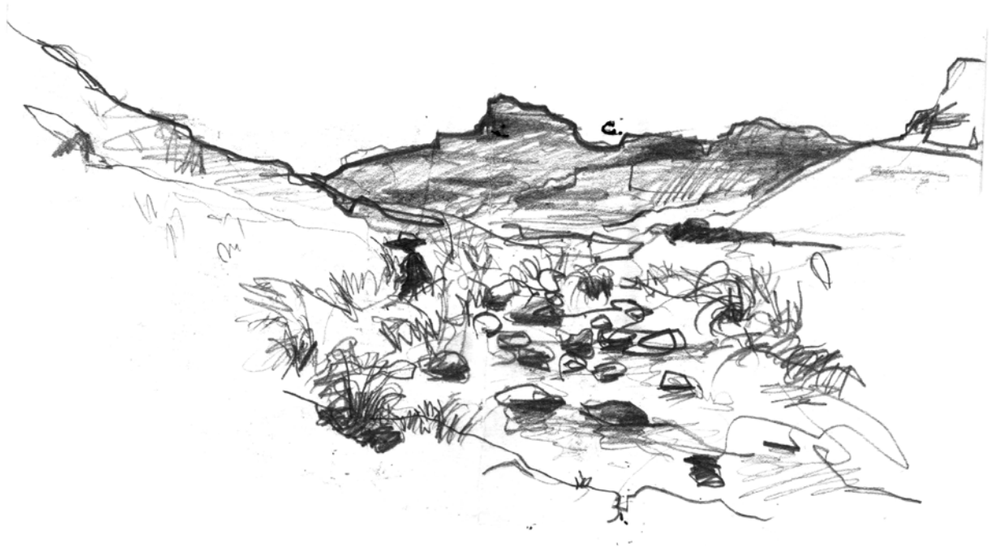
First-hand accounts of addiction and rehabilitation allowed us to see behind the curtain into spaces that are seldom discussed in the open; historians revealed a lingering societal pattern of neglect and exclusion of the mentally ill.

Phenomenology in conversation with trauma-informed design revealed the qualitative spatial conditions needed for a body in distress; and technical investigations found ways to spatialize these needs.

Investigating practical ways to implement regenerative design on the site revealed that there are innovative ways to use invasive vegetation as structure.

The design evolved according to the pressures and opportuinities of the site, and the needs of the stakeholders.

Looking into the relationship between the body and the elements revealed that sunlight and an produce a myriad of sensory qualities and have the potential to play a pivotal role in the production of immersive healing spaces.



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List of Figures

Addendum A: Ethics Approval Letter

UNIVERSITY OF CAPE TOWN
IYUNIVESITHI YASEKAPA • UNIVERSITEIT VAN KAAPSTAD

2023/06/08

EBE/00181/2023

RE: Research Ethics Committee Project Approval Letter

Dear Sasha Czech,

Your application for ethics review of your project titled

Permeability of Thresholds: Between Recovery and Re-connection.

has been reviewed and evaluated by the

Engineering & Built Environment Committee.

You may proceed with your research project titled:

Permeability of Thresholds: Between Recovery and Re-connection.

Please note that should:

(i) any serious or adverse effects to participants occur and/or,

(ii) aspect(s) of your current project change and/or

(iii) any unforeseen events that might affect continued ethical acceptability of the project occur then you should immediately report this to the approving REC. You may be required to submit an amendment to this application, in order to determine whether the changed aspects increase the ethical risks of your project.

Based on the information supplied your application has been successful and is approved.

Please note the following additional conditions associated with this approval:

(i) There might be some level of risk as this is a sensitive research topic. However, the applicant has provided a detailed and comprehensive discussion of potential risks and how these will be mitigated. The applicant also has a viable data storage and protection plan.

Regards,

Engineering & Built Environment Committee.

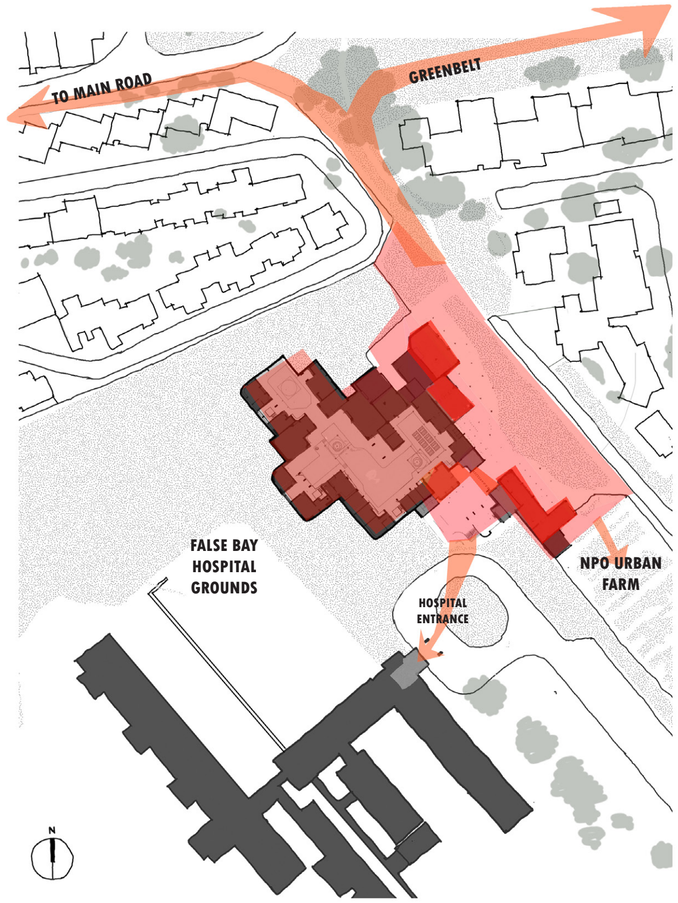
Addendum A: Accommodation Schedule

The Space	What happens there	Size	Quantity
Primary Care			
Entry and Outpatient Facilities			
Reception		9	1
Waiting		9	1
Toilet		3	1
Interview room		9	2
Consult room		9	1
Medication room		4	1
Outpatient group room		20	1
Patients: Communal Space, Activities			
Kitchen (with serving area)	Catering Staff cook meals	60	1
Dining Room		80	1
Lounge		100	1
Outdoor recreation		75	
Exercise area		90	
Prayer room		9	
Workspace/quiet room	written work therapy	25	
Creative space- loud	Occupational therapy	25	
Toilet- universal access		6	1
Laundry		12	1
Therapy			
group therapy rooms	Group therapy	20 (Space for 12 people)	4
Individual therapy/counselling rooms	One-on-one therapy	9	8
Seminaar hall	Meetings and talks	80 (40 people capacity)	1
Medical			
Nurse's Station			
Examination rooms	Medical examinations		

The Space	What happens there	Size	Quantity
Staff room and kitchenette		20	1
Staff Locker room			
Staff toilets		3	3
toilet- universal access		6	1
Office		9	2
Office w. workstations		5.5	15
Shower & ensuite		3	1
Sleepover		9	1
Support			
Linen store		2	1
cleaner's rooom		5	
comms room		9	
Disposal room		10	
store		9	
utility		8	
Pod type 1 (4 in total, 85sqm each)			
Bedroom - 4	Sleeping, storage of belongings, alone time.	40	2
Shared shower&basin	Showers Basins	6	2
Shared toilets		4	1

The Space		Size	Quantity
Pod type 2 (1 in total)			
Bedroom - 4 people		40	1
Bedroom- 3 people		20	1
Bedroom- 1 person, accessible.		18	1
Ensuite - accessible		7	1
Shared Bathroom		6	1
Services			
Parking		25 bays + 1 loading bay	
Circulation		32%	
Store rooms			
Public features for hospital users			
Coffee shop			
Public toilet			
Rentable seminaar venue			
Public park			

Addendum C: Final Presentation Drawings



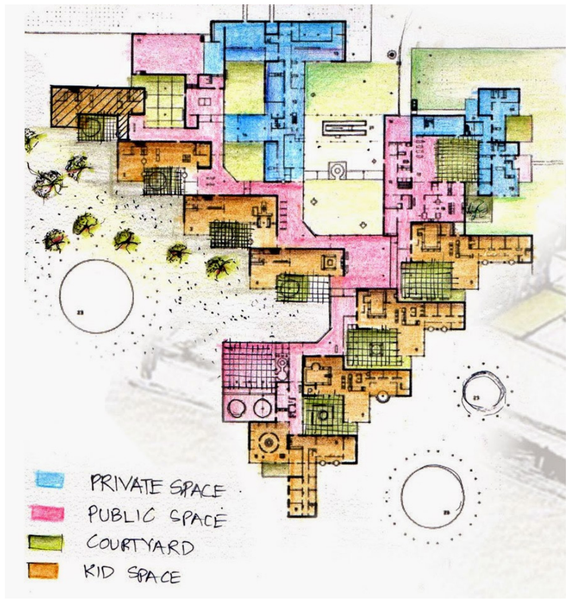
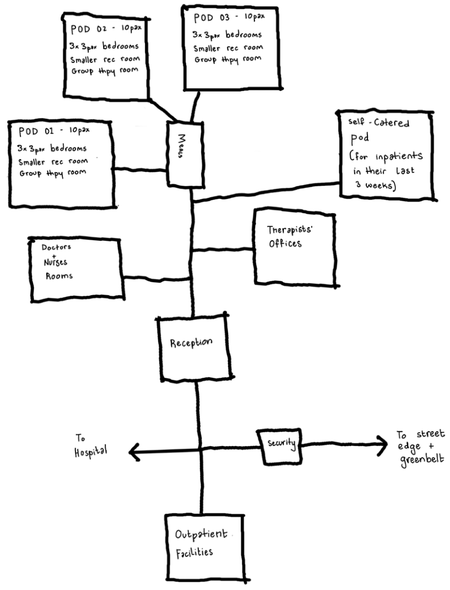


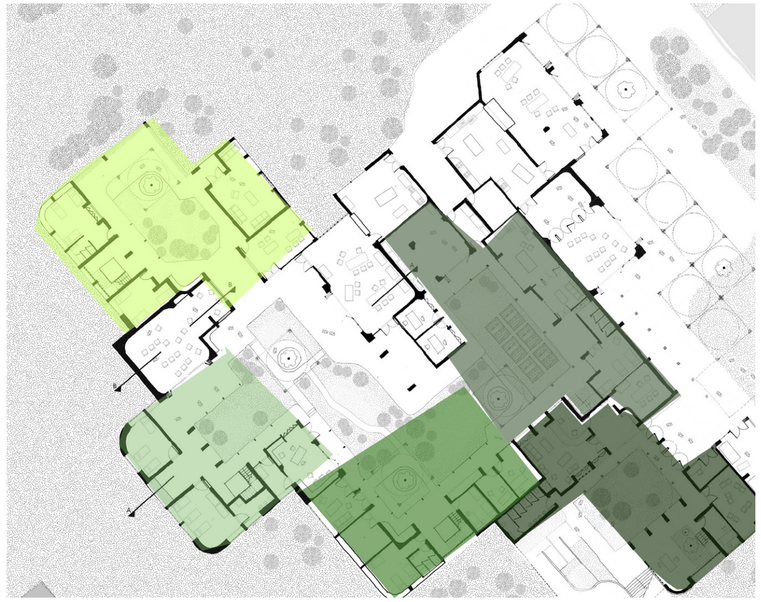
Image source: Unknown Author, N.d.

ALDO VAN EYCK'S AMSTERDAM ORPHANAGE

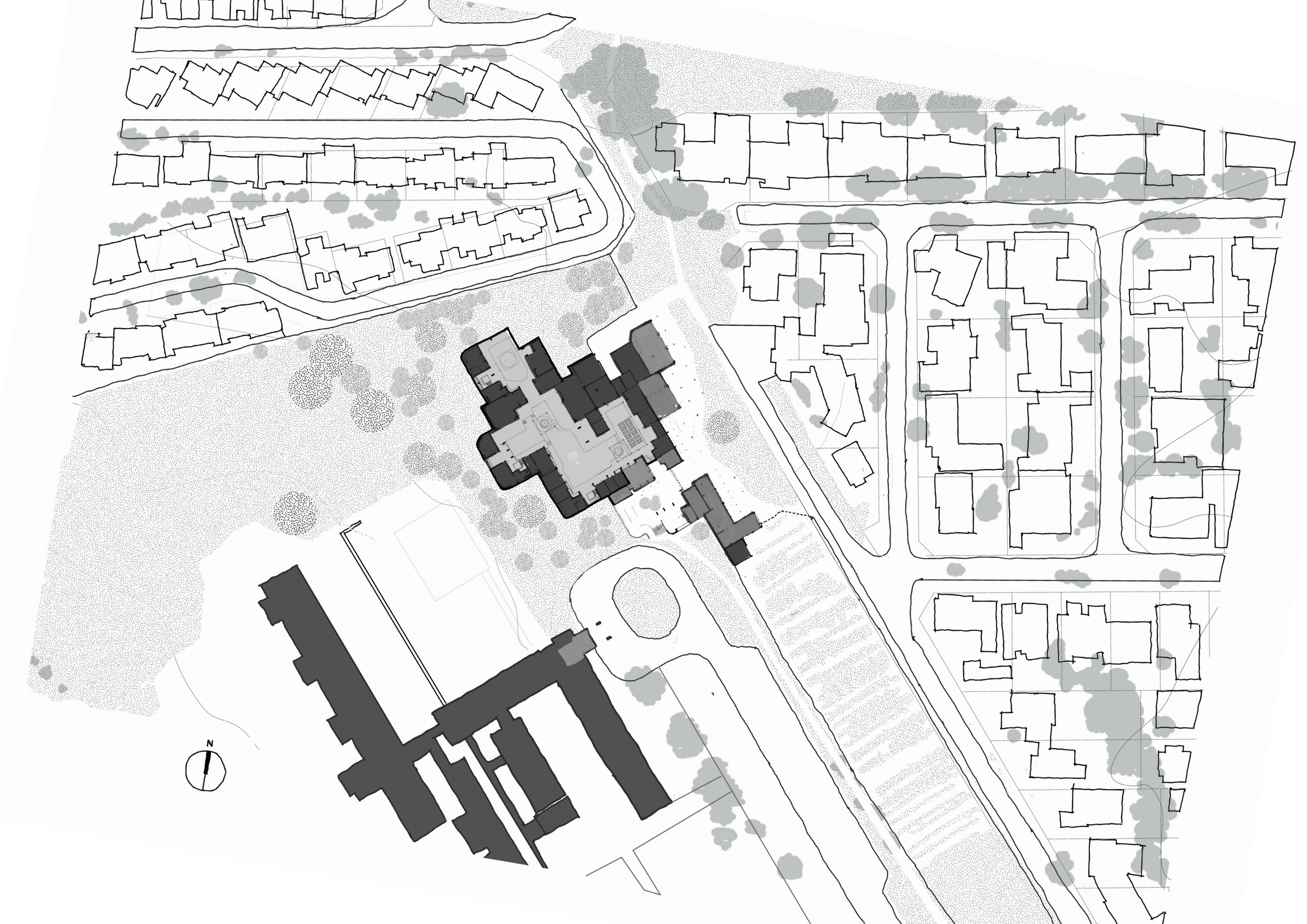
Treating the building as a small urban study, creating distinct 'streets' within the facility, each with their own character.



HYBRID CIRCULATION AND GROUPING

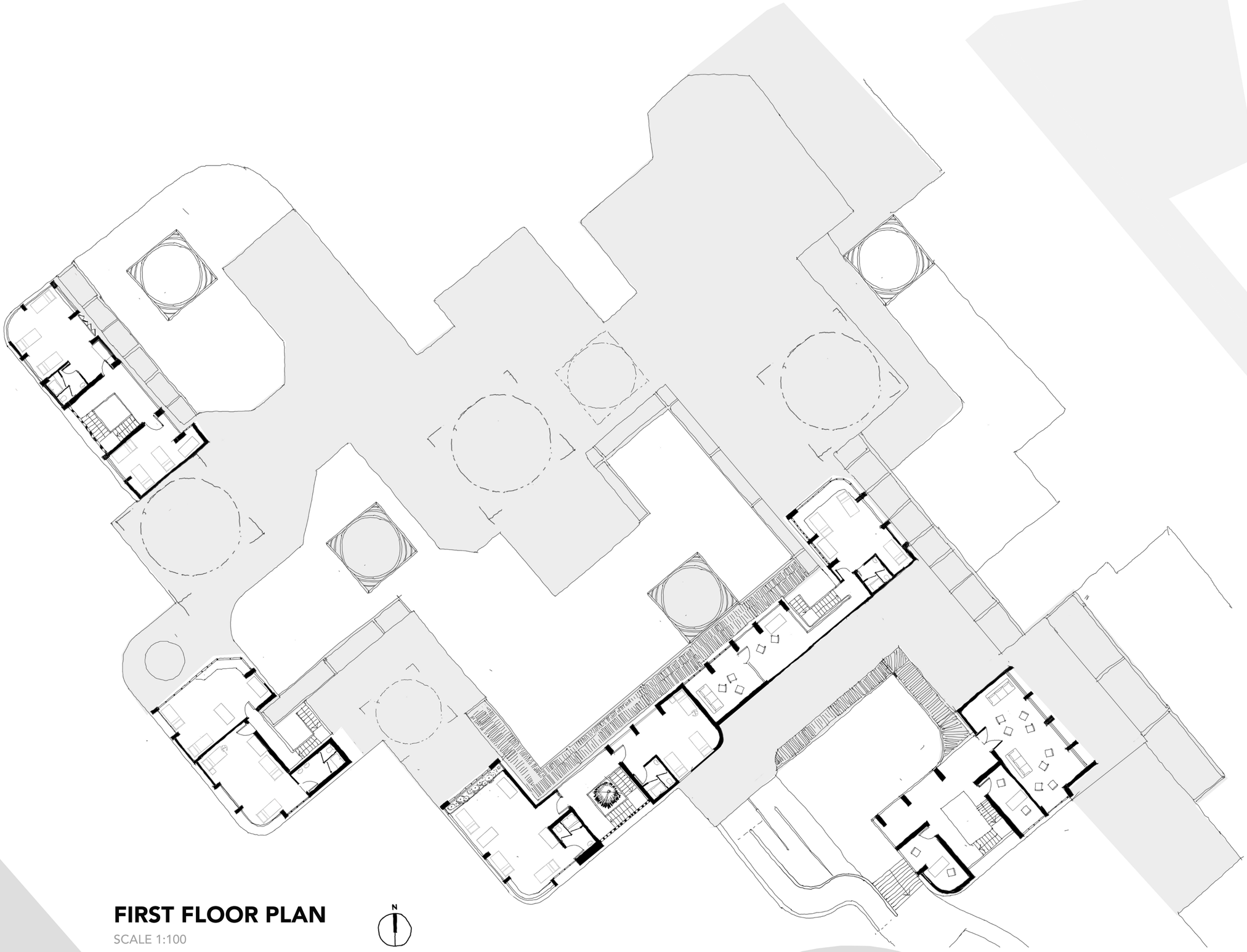


THE COURTYARDS


N

GROUND FLOOR PLAN

SCALE 1:100

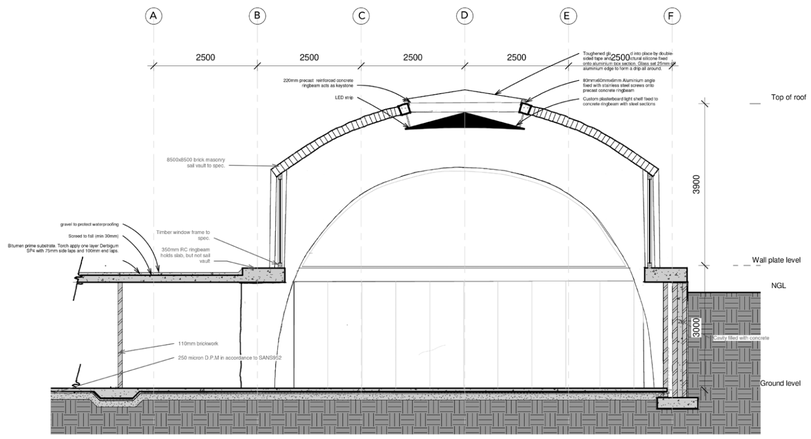


FIRST FLOOR PLAN

SCALE 1:100

SECTION A

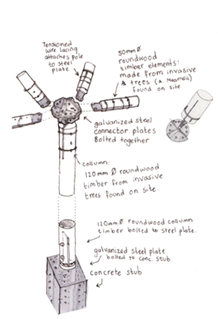
SCALE 1:50

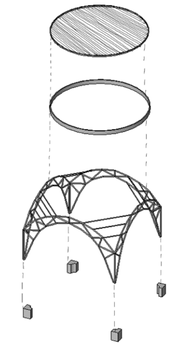


SECTION B

SCALE 1:50

INVASIVE WATTLE





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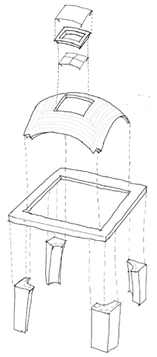
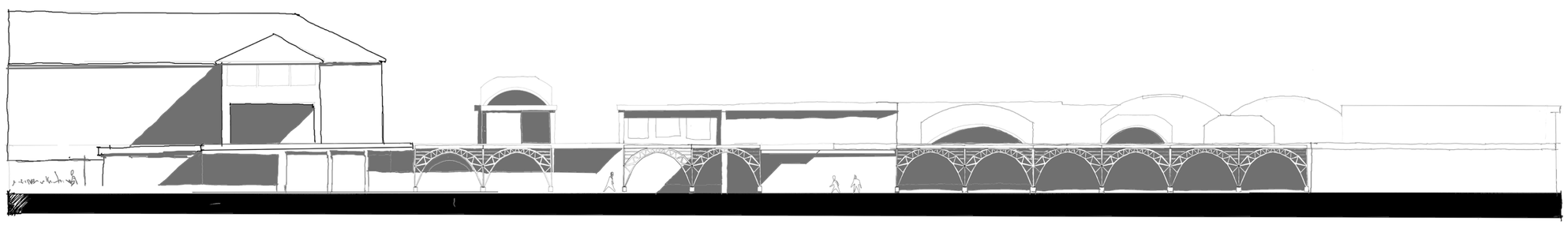


BRICK MASONRY

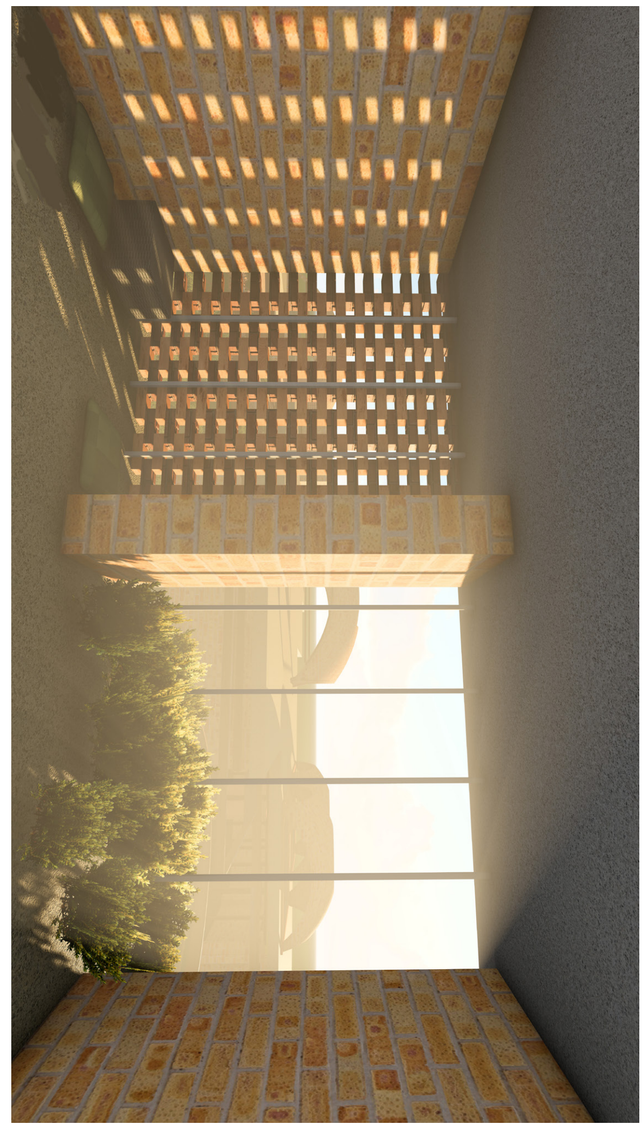
SAIL VAULT DETAILS



STREET ELEVATION

SCALE 1:100

Refuge Courtyard View



Bedroom View

Garden Courtyard View

Central Courtyard view