

Healing Through Restoration

The adaptation of Cape Dutch Revival Architecture in George into a place for healing



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Plagiarism Declaration

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I know that plagiarism is wrong. Plagiarism is to use another's work and pretend that it is one's own.

I have used the APA method for Citation and referencing.

Each contribution to, and quotation in, this paper from the work(s) of other people has been attributed and has been cited and referenced.

This paper is my own work.

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02.08.23

Preface

My interest into the topic of restoration, both architecturally and of the human condition, started during the periods of lockdown that occurred during the covid 19 Pandemic, while I was at home with my family in the Garden Route town of George. Upon periods of high uncertainty, anxiety and fear of the unknown, I found healing and restoration through runs and walks along several green spaces located throughout George. These included parks, public gardens, streets with lush greenery and particularly the forests located near the urban edge of central George at the foot of the Outeniqua Mountains.

A particular route which I frequented was located down the road from my family home in the suburb of Camphersdrift, along a stretch of Greenery known as the Van Riebeeck Gardens. With several Meandering paths, a river which flows through the gardens from the bordering forest, and several species of trees and plants that create shaded spaces, the gardens naturally became a space for me to escape to in stressful times, leaving me feeling restored once I had completed my walks and runs.

Upon my visits to the van Riebeeck Gardens, usually walking 800m from its northern border to its southern border, I became very aware of a dilapidated structure which seemed to have had an existing relationship with the Gardens prior to its Neglect. With the site's prime location, being 600m from the centre of George, and its eastern boundary bordering the property of the George Municipal Hospital, and the sheer size of the open land surrounding the existing structure, I began to wonder what the history behind the neglected structure was.



Introduction

This research paper critically looks into the restoration of built fabric while exploring how architecture and its relationship with nature has as the ability to create spaces that enhance and restore the well-being of individuals within a community.

With particular focus on a site located in George, South Africa, the theoretical inquiry aims to better understand the history and heritage importance of a dilapidated residential structure located on the site, while exploring strategies and theories of adaptive reuse that could creatively and respectfully inform any proposed architectural design interventions to the structure. The inquiry's second point of entry considers the site and neighbouring public garden's existing biophilic characteristics, and the potential it has to positively impact the well-being of those who visit or pass through it. In addressing this, different theories of healing in architecture are also unpacked within the paper, aiding in a better understanding of the psychological aspects of human perception and the different external stimuli that architects have control over, to create warmer, stress-free spaces.

As a result of the sustainable nature of timber, and the woody textures that dominate the site, the use of timber becomes a powerful notion in material choice and is further explored for its potential implementation as a structural element.

The technical research in this paper explores mass timber technology and discusses the benefits of engineered timber, and the pre-assembled nature of its construction compared to traditional methods of construction. Looking at two different case studies, the paper also explores how mass timber can be implemented into a project which incorporates biophilic principles, while also exploring its use in dealing with the restoration or adaptation of an existing heritage structure.

While referring to academic journals, books and newspaper articles to piece together the narrative of the existing structure and the relevant theoretical and technological inquiries, visiting the site and walking around and through the structure were just as useful in providing insightful cues to research prompts.



Figure 1: Photographs taken along my normal running walking route near the site



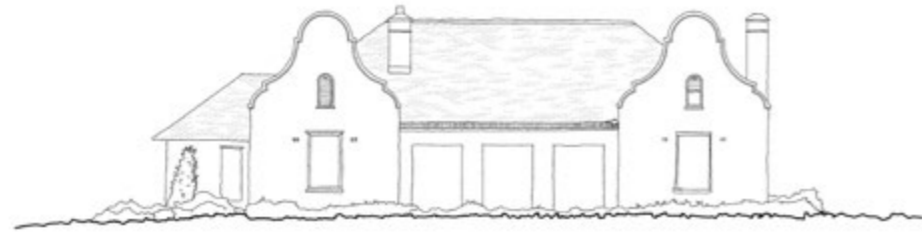
Figure 2:





Figure 3:

History



Cape Dutch Revival Significance

As the nineteenth century was coming to an end, South Africa consisted of separate geographical and political entities and included the British colonies of Natal and the Cape, the Transvaal and Orange Free State Boer Republics as well as territories that were under "Native Law."

Identifying the potential to unify these areas under the administration of the British, Cecil John Rhodes among other British Imperialists, had the goal of securing wealth and power in South Africa through the exploitation of mineral resources and utilizing the black labour that was available. In order to achieve this the need to overcome the antagonism that existed between the Afrikaners and English.

Eight years after the Second Boer war, commonly known as the Anglo-Boer war had ended, the union of South occurred in 1910. With the Union came the realisation of the need to form a common white identity that would combine the republics that were previously at war with the British empire into one new country. Despite their differences, common ground was found between the English and Afrikaners in their European culture, forming a basis for their new shared identity.

While the emerging discourse of the Arts and Crafts movement was present in Britain during the end of the 19th century, in South Africa, the movement found resonance with Cape Dutch homesteads, particularly in the Cape. When Cecil John Rhodes commissioned Herbert Baker to design his new residence in Cape town, Groote Schuur, the Cape Dutch Revival style was initiated. (Coetzer, 2013)

The History of the old Magistrate's Residence

Ownership

Approved on 16 November 1929, the residence was designed by John Stockwin Cleland as the official residency for the Magistrate of George, and on 7 May 1930, the Deeds office in Cape town registered the plot on which it was to be built (AK, T3679). Following the traditional U-Shape floor plan, with 2 gabled facades framed with profiled mouldings, the residency is an example of a Cape Dutch Revival-styled building.

Physical Description

Its primary entrance is located in the centre of its "Stoep" in the hollow of its U-shaped floor plan, and is covered by a corrugated iron veranda supported by 2 concrete pillars. This entrance leads one past what once was a living room with a fireplace to a passage at the back of the house, which provides circulation to the kitchen and bedrooms. While the gables of the magistrate's residence display similar elements to that of the simple gables that were seen during the Cape Dutch Era, their proportions are noticeably narrower with differing proportions. On both gabled façades, an air vent can be seen above the sliding sash window each containing arched lintels with radii proportionate to the arch of the Gable. Besides the chimney which can be seen protruding through the left of the residence's shingled roof, the façade's Elevation appears to be symmetrical. (Stander, 2022)

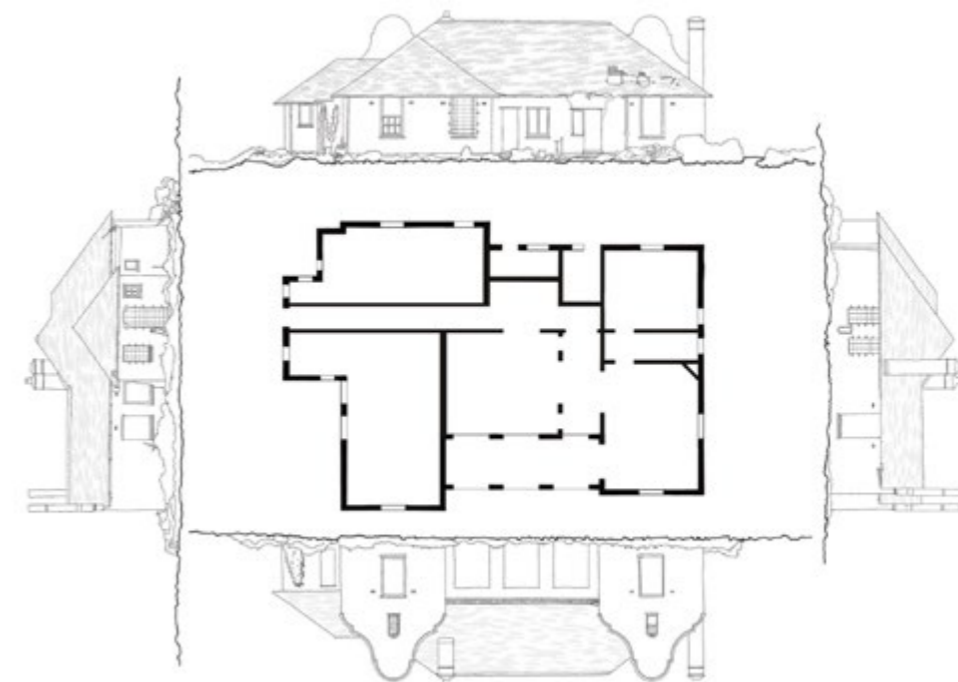


Figure 4:

The Architect

Working as Chief architect for the Public Works Department for the Union of South Africa from 1920 until 1932, John Cleland oversaw the design of several Government buildings including Hospitals, Schools, magistrate courts, Galleries, Post offices, police barracks etc. (Walker, n.d.)

While Cleland's personal architectural influence during his time working as Chief Architect for the Public Works Department (PWD) is unclear, the union's attempt to create a South African style may have greatly guided his design choices. His own residence in Sea Point which he designed in 1904 however, is reflective of the Arts and Crafts movement, while his last house was designed in a Spanish mission Style.

Cleland worked and corresponded with Herbert Baker on numerous seminal buildings, working with several other notable architects of the time such as G E Leith. Among other areas of influence, Cleland was regularly asked to join other architects in assessing architectural competitions where his co-decisions would ultimately have an impact on the broader style of architecture in the country. The last building that he would come under him as Chief architect of the public works department, was Groote Schuur hospital. The public architecture designed between the 1920's and 1930's has character that is undoubtedly distinguishable, and while little is known about Cleland's direct influence, his role as Chief Architect during this time had a hand in creating distinctly recognisable government buildings.



in Foto en kunstenaarskrets van John Stockwin Cleland. (Die name van die foto/graaf en kunstenaar is ongelukkig nie beskikbaar nie)

Figure 5:

Heritage Grading

The site and structure is considered a "Local Heritage Resource" and has a grading of IIIB. This means that the structure has "sufficient significance to be protected for its individual intrinsic merit" and is listed on the provincial heritage register while being accommodated for in the local zoning scheme. While IIIB classification may be very similar to that of IIIA graded buildings or sites, those classified as IIIB are of marginally less significance which influences the regulation of alterations that may occur internally.

Much like grade IIIA sites and buildings, those graded as IIIB too may be representative of "Excellent examples of their kind, or may be rare, but no less than grade IIIA examples". This ultimately implies that less rigid protective measures than that of grade IIIA sites and buildings should be applied to those graded as IIIB, and that internal alterations in this context should not be regulated.

However, due to the "Proposed Clause in Local Zoning Scheme" no new building or structure may be erected on a property containing a grade IIIB building without the special consent of the municipality, who shall "take account of the provincial heritage resources authority requirements". No special consent may be granted if any proposed demolition, alteration, extension, or new building will have detrimental effects on the character and/or significance of the existing structure or building. (Heritage Western Cape, 2012)



Figure 6:

Adaptive Reuse

Architecture vs Conservation of Heritage

In the practice of contemporary architecture, it has become increasingly important to implement methods of repair and restoration to existing buildings and structures, extending their lifespan while maintaining continued use. While multiple reasons can be credited for the increasing emphasis on repair and restoration, 3 primary reasons include:

1. The increased need for sustainable patterns of development
2. The current economic climate that needs more affordable architectures
3. The growing awareness of the advantages that come with the preservation of architectural heritage .

As a means to address these concerns, “Adaptive reuse” has become a sustainable approach to meet the needs of the current economic climate, while retaining important architectural heritage. Although the term lacks complete establishment in the industries of construction and design, Adaptive reuse is very useful and rests on the premise of adjusting the function of existing buildings to suit the evolving needs presented by the economies and societies that built them in the first place.

While serving as a useful architectural approach today, the phenomenon of Adaptive Reuse is far from new. ‘Pragmatic’ interventions such as the transformation of monuments for new uses, or the repurposing of materials from older buildings for the use in the construction of new ones were a common occurrence at the time of the Renaissance. Religious buildings in the 18th century were also known to be adapted to serve military or industrial functions after being confiscated and in the midst of the French revolution. These interventions however did not coincide with the contemporary concept of preserving heritage, but instead were purely driven by financial and functional purposes.

More academic arguments on adaptive reuse as a means of preserving historic monuments and structures only really began in the nineteenth century, when it swiftly became a debate split between two opposed positions. On one hand, the ‘restoration movement’ was guided in France by Eugène Emmanuel Viollet-le-Duc (1814-1879), while in England, the ‘conservation movement’ was headed by John Ruskin (1819-1900). Over the last hundred and fifty years however, due to the input by various theorists, designers and conservationists, the dispute on how existing buildings should be dealt with has evolved. (Plevoets, 2019)

Today, there are more diverse perspectives and ideas on what “adaptive reuse” exemplifies compared to the opposing positions held in the period of Viollet-le-Duc and John Ruskin. Adaptive Reuse represents a multidisciplinary field that combines architecture, conservation, planning and interior design while being guided by cultural, social, ecological, and political interests. The way in which Adaptive Reuse is defined is continuously evolving and what it represents at its core is often ambiguous, often compared synonymously to terms such as “adaptation”, “rehabilitation”, “retrofitting”, “conversion” etc.

While the opposing views of Viollet-le-Duc and John Ruskin have since evolved into more varied academic discussions, understanding the basis of the terminology which grounded the debates of “Restoration vs Conservation” provides a useful lens through which to analyse the development of Adaptive reuse.

Viollet-le-Duc and John Ruskin : Restoration vs Conservation

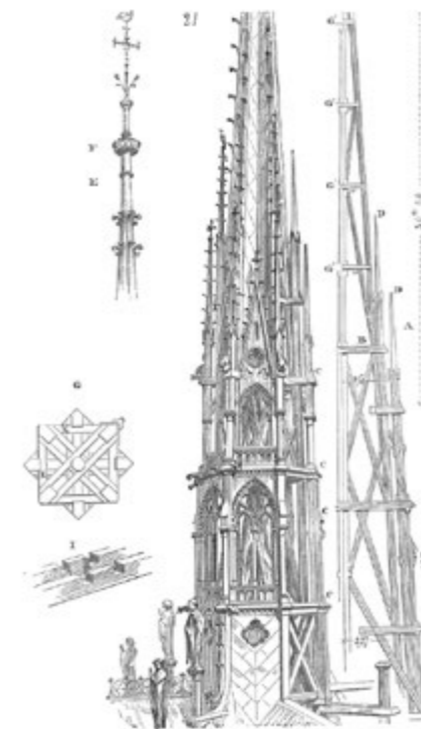


Figure 7:

As an Architect and the first primary inspector of the ‘Commission des monument historiques’ in the 19th century, Viollet-le-Duc was involved in several projects that facilitated the restoration of existing architectural works. Multiple of these works entailed the restoration of Gothic buildings and include iconic structures such as the Notre Dame Cathedral in Paris as well as the castle of Pierrefonds. (Plevoets, 2019)

In his approach to ‘restoring’ these buildings, the interventions that were carried out often included the addition of parts that were completely new, while attempting to maintain the ‘style of the original’. With the attempt to demonstrate the Nation’s achievements during the French Revolution (1789-1799), the approach implemented by Viollet-le-Duc to restore existing buildings was very much rooted in the nationalist Zeitgeist .

While being an architectural movement within the French Nation at the time, the restoration movement mastered and implemented by Viollet-le-Duc was not confined within the French border. In his writings and the work which he produced; Viollet-le-Duc made clear what his restorative approach to historic buildings entailed.

“...the best of all ways of preserving a building is to find a use for it, and then to satisfy so well the needs dictated by that use that there will never be any further need to make any further changes in the building. ...In such circumstances, the best thing to do, is to try put oneself in the place of the original architect and try to imagine what he would do if he returned to earth and was handed the same kind of programs as have been given to us. Now, this sort of proceeding requires that the restorer be in possession of all the same resources as the original master – and that he proceeds as the original master did.” (Plevoets, 2019)

While Viollet-le-Duc has had long lasting influence on theories of restoration, setting a precedent for adaptations in contemporary architecture worldwide, his work and theories of approach have not been without criticism, both now and in the past. Contemporary theorists and architects as well as those who were around in the time of Violet-le-Duc were completely against his promoted approach. John Ruskin was known to be one of his primary critics while being the primary promoter of the conservation movement. According to Ruskin, the approach of restoration promoted by Viollet-le-Duc caused nothing but destruction, while also falsely describing the structure that once was. As per Ruskin:

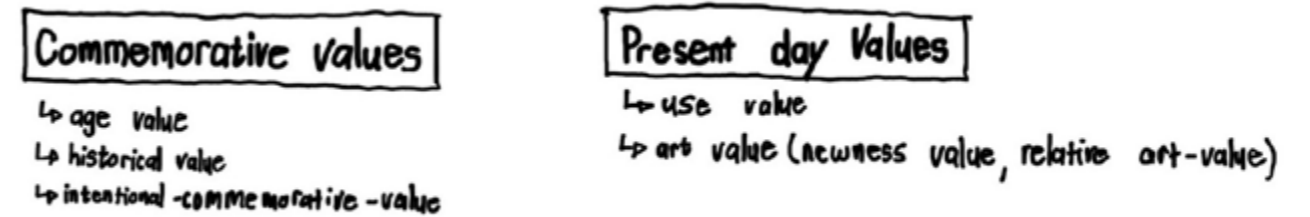
“It is impossible, as impossible as to raise the dead, to restore anything that has ever been great or beautiful in architecture... Do not let us talk then of restoration. The thing is a lie from the beginning to end... Take proper care of your monuments, and you will not need to restore them”.

In saying this, Ruskin's purist philosophy of conservation becomes evident, blatantly rejecting the damaging elements of Viollet-le-Duc's “restoration” and substituting them with protective measures of monumental maintenance and conservation. In 1877, William Morris, a pupil of Ruskin initiated the Society for the Protection of Ancient Buildings (SPAB) which viewed buildings as works of art, each located historically within a unique context. The process of aging that occurs over time was seen as playing an instrumental role in the formation of beauty in a building, thus not requiring removal or restoration, but instead retaining the structure as well as the function for which it was designed and built.

Ruskin's movement of anti-restoration stands firm in the belief of conservation, enabling a building to stand independently and reveal its own historical narrative. Sparking debates that spanned the entirety of the 19th century and extended well into the 20th century, the contrasting approaches of Violet-le-Duc and Ruskin continued to be a subject of contention.

Further development of Adaptive reuse theory

In the early 20th century, the historian Alois Riegl introduced a new way in which to value monuments, adding to the conversation of the restoration vs conservation perspectives of the years prior. Dividing this grouping into Commemorative values and Present-day Values, Riegl simplified the lenses through which to value monuments and ultimately buildings.



Through Riegl's understanding of both the Restoration and anti-restoration (conservation) movements, his refined approach was in support of a restorative means of adaptive reuse. Through his concepts of Alterswert (age value) and Denkmalwert (historical value) Riegl argued that a dynamic relationship between present and past be maintained in the restoration of a building, acknowledging the significance of the unique layers of historical value that make up the building while allowing for the contemporary needs of the building to be met through adaptation.

Camillo Boito, another author to join the controversial argument between Ruskin and Viollet-le-Duc, suggested that the approach chosen for the restoration of a specific project should take into consideration the unique circumstances of the monument or building in question, and be tailored to its specific conditions. Unprecedented in the prior debates of restoration, Boito put forward set guidelines that could be used by restorers and designers to approach building adaptation, tailored to the unique nature of each project at hand through methods of “archaeological restoration”, “picturesque restoration” and “architectural restoration”.

Furthermore, to adapt monuments (although also applicable to buildings) while maintaining clarity about the existing and the new within a restoration, Boito promoted eight methods for to guide designers and restorers of monuments:

1. Differentiating between the style of the new and the old;
2. Differentiating between construction materials;
3. Suppressing of profiles or decorations;
4. Exhibiting removed old pieces which could be installed next to the monument;
5. Inscribing the date of restoration (or other conventional sign) in each restored piece;
6. Using a descriptive epigraph carved on the monument;
7. Describing and photographing the different phases of the work and placing the documentation within the building or nearby
8. Underlying notoriety

The Influence of World War on adaptive reuse theory

As a result of the destruction caused by World War 1, the Athens charter of 1931 became the first document whereby a policy of modern conservation was promoted internationally, influenced by the theories and methods of Camillo Boito. While the international museum office worked to analyse the many issues related to the conservation of heritage due to the war, modernist architects also identified the opportunity to implement their ideas at different scales, as was promoted at the CIAM Congress of 1933. This created a clear divide between approaches of restoration and conservation on one side, and the emerging modern architectural practices on the other. While attempts to conserve and adapt the remaining built fabric to contemporary post-war needs, modernist architectural movements rejected that which remained of the existing, viewing it as a constraint to development.

As several notable theorists and architects grew increasingly interested in undertaking projects involving historic buildings by the 1960's, the opposing perspectives of conservation and architecture began to merge. Simultaneously, the way in which conservation was perceived was also shifting, and as a result of the increasing number of buildings in need of conserving, the concept of "heritage" was no longer limited to buildings considered antique or medieval. The 1964 Venice charter ultimately reassessed the concept of conservation and highlighted the value of Adaptive reuse as a means to practice conservation.

Theoretical Approaches to adaptive reuse

1. Typological approach

In the 1975, Sherban Cantacuzino, a forerunner of research into adaptive reuse, wrote an essay in his book titled "New uses for old buildings" whereby he discusses the role of adaptive reuse in the practice of conservation. Making reference to specific examples of adaptive reuse located globally, Cantacuzino later categorized and organized the projects into eleven different host-space typologies. These included:

1. Churches and Chapels
2. Monastics and religious establishments
3. Fortifications, gates, and barracks
4. Town houses, country houses, outhouses, and other ancillaries
5. Schools
6. Corn exchanges
7. Barns and granaries
8. Mills
9. Maltings and breweries
10. Warehouses and other industrial buildings
11. Pumping stations

Discussing these eleven typologies, Cantacuzino then proposed new prospective functions that would suit the needs of the unique typological characteristics. (Plevoets, 2019)

Refining these into only six different categories of buildings in his second publication (1989), Cantacuzino once again used examples to explore different building types and how they fit into their respective categories. These categories included (1) Industrial buildings, (2) Religious Buildings, (3) Semi- public buildings, (4) Residential buildings, (5) Military Buildings and (6) Commercial buildings .

2. Technical approach

Placing a strong emphasis on structure and technical aspects of a building, the technical approach to adaptive reuse relies heavily on a detailed understanding of the condition of the existing building, its capacity and the different technical aspects that would affect the way in which it would need to be adapted to accommodate its new use. As many authors have approached adaptive reuse through the lens of technicality, certain 'guidebooks' have been created to assist in understanding the technical aspects required to adapt existing buildings to new functions. One such author is Highfield who published a booklet titled 'The rehabilitation and re-use of old buildings' in 1987 whereby he illustrates the benefits of rehabilitation of both domestic and non-domestic structures, and the means in which to improve fire resistance, acoustic and thermal performance, as well as how to prevent the decay of timber due to the penetration of damp and condensation. (Highfield, 1990) While the technical approach of adaptive reuse focuses on important technical aspects to promote protection in the existing structures for continued use, buildings are viewed as little more than a container or shell for reuse, with little focus on the importance of a building's heritage, or the conservation thereof.

3. Strategic approach

The Strategic approach to adaptive reuse aims to repurpose existing buildings to meet the requirements of their new uses while placing equal importance on the preservation of their historical, cultural or architectural value and meaning.

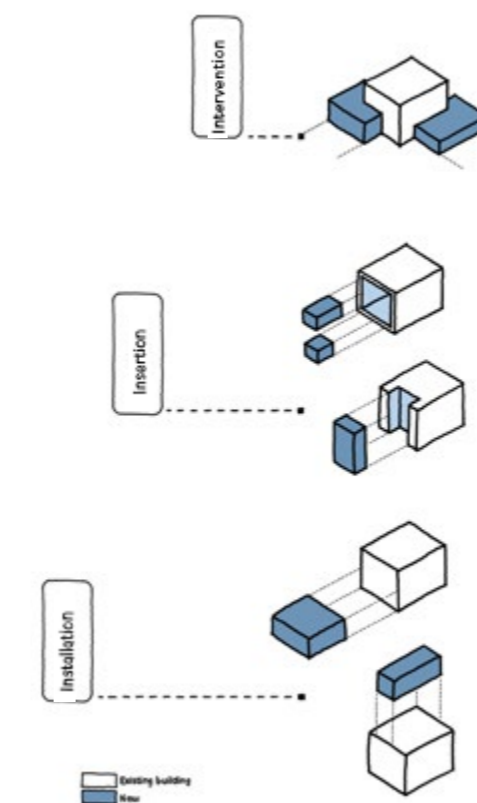
Placing focus on the strategies and processes involved in the conversion of important buildings, Machado explores different ways in which one could approach the remodelling of building in his essay titled 'Architecture as Palimpsest'. Not only should the process of remodelling be restricted to producing form, but it should also be considered essential for the architect to consider the meaning of the building and its past in approaching the process of remodelling (adaptive reuse). (Machado, 1976)

"Remodelling is a process of providing a balance between the past and the future. In the process of remodelling, however, the past takes on a greater significance because it, itself, is the material to be altered and reshaped. The past provides the already written, the marked "canvas" on which each successive remodelling will find its own place. Thus, the past becomes a "package of sense", of build-up meaning to be accepted (maintained), transformed, or suppressed (refused)" – Rodolfo Machado

Robert, also using palimpsest metaphorically, expands on conversion as a concept and identifies seven different ways that the architectural conversion of a building can occur, making reference to historical and contemporary examples to classify seven different types of physical intervention. These include:

1. Building within
2. Building over
3. Building around
4. Building alongside
5. Recycling materials or vestiges
6. Adapting to a new function
7. Building in the style of

Looking at archetypal cases of modern-day conversions, Stone and Brooker introduced a different lens through which to view conversion strategies including (1) intervention (2) insertion and (3) installation. Placing importance on the original structure, their strategies focus on the sentimental meaning that guides the adaptation. By implementing one of these strategies, they propose that the meaning attached to the existing building being adapted can either be 'accepted', 'transformed' or 'suppressed'. (Plevoets, 2019)



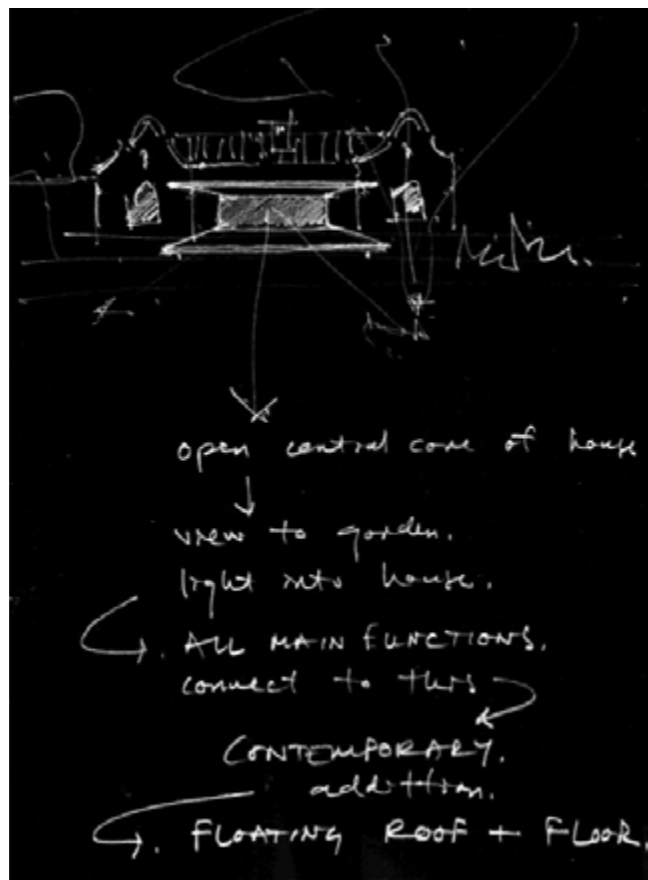
"It is through an understanding and interpretation of the spirit of place and the particular contextual setting within which a building exists that the designer or architect can heighten, change and reactivate a space. An existing structure is bound to a setting; it has certain qualities that are uniquely only to that particular situation. The designer can analyse and use these found qualities as the starting point or basis for the next layer of construction". (Brooker & Stone, 2008)

Jagger similarly classifies different case studies by (1) addition, (2) transformation or (3) conversion, while Cramer and Breitling establish a difference between 'architectonic expressions' and 'design strategies'.

Figure 8:

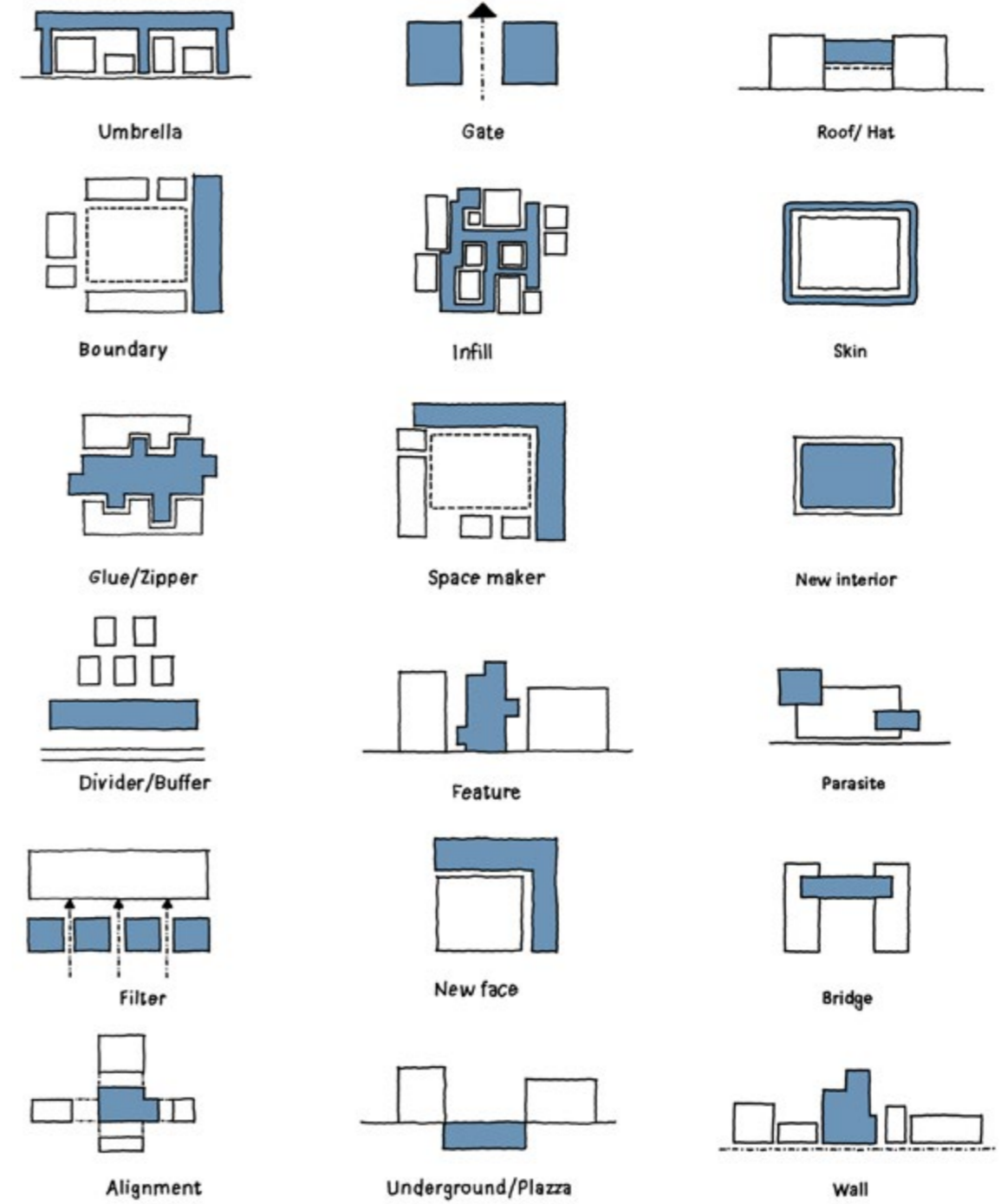


Figure 9



Existing building
New

Figure 10:



Healing Architecture

As a result of the fast-paced way of life that exists in modern society, the levels of stress and the impact on our mental well-being are perpetually elevated, constantly altered by exposure to different external stimuli. As we are constantly moving from one thing to another in the busyness of our daily lives, our ability to process and understand the feelings that result from these stressors also minimized. As a result of this cyclical phenomenon, the likelihood of developing mental illness inevitably increases.

Throughout history, it has been evident that there is a relationship between humans and the environments that they occupy through physical, emotional, and mental connections. The built environment, having a presence within our daily lives has the ability to shape and impact the activities which we experience in it. As a result of the intricately connected nature of behavioural psychology and architecture, the spaces which we as humans occupy, plays a significant role in the formation of our identity and the sense of self. In the design of healing environments, architects and designers have the ability to control the physiological and psychological effects that different spaces have on humans as occupiers of these spaces.

Environmental psychology

The study of environmental psychology explores the effects that result from the different 'interactions' and 'transactions' that occur between humans and their physical environments. As a result of these interactions, humans not only have an impact on their environments, but are simultaneously influenced by them too. Drawing on the theory of environmental psychology, Architectural psychology focuses rather on the qualities of space and how space is interpreted by individuals. The psychological impact of a space is determined by how the space is perceived, how people behave in a particular space, how accessible a space is, how inclusive a space is, as well as the satisfactory and experiential qualities that define it. (Fatima, 2019) Therefore, it is important for an architect to design space that positively impacts the psychological and physical conditions of its occupants.

"Weshapeourbuildings,andafterwardsourbuildingsshapeus"(Hansard,1943)

Architectural healing environments

In Psychological, medicinal, and even natural healing, the recipient is required to have a physical external antidote for the healing to occur. The recipient then holds the responsibility to take the inward step of acceptance and observation to foster the process of healing. If the qualities of the physical context of the recipient is ignored however, the healing process may unintentionally be impeded by it.

Investigating the healing process within the context of hospital wards, a study completed by Roger Ulrich exhibited the patient's ability to heal faster when the wards looked out at views of nature. Out of a sample group of 46 patients, (23 with beds facing a wall, and 23 with beds facing a window with views of nature), Ulrich analysed the vital signs, and doses of pain medication taken by patients. It was found that those facing the windows with views of the surrounding landscape and foliage required less medication to treat pain while also healing more rapidly than those without windows. Furthermore, natural air and sunlight were found to be the most efficient ways of killing bacteria and air purification.

Dealing with the relationship of the built environment and the well-being of it's user, Roger Ulrich states that "there is increasing scientific evidence that poor design works against the well-being of patients" (Ulrich, 1995). From this perspective, the primary objective of designers and architects should be to improve wellness by designing Psychologically supportive environments. (Ruga,1989).

APPROACHES TO THE DESIGN OF HEALING SPACES

1. Evidence Based Design (EBD)

Evidence-based Design (EBD) makes use of scientific methods to achieve the best possible outcomes when designing and constructing physical environments. Using research outcomes to create links between spatial design and healing, several studies have resulted in a better understanding of how the healing process can be influenced by different spatial design factors.

Healing is defined by the Samueli Institute as a “holistic, transformative process of repair and recovery in mind, body, and spirit resulting in positive change, finding meaning and movement towards self-realization of wholeness, regardless of the presence or absence of disease (Firth et al., 2015, p. 12)

For healing to occur, an optimal healing environment (OHE) needs to surround an individual with elements that enable the process of healing to occur (Sakallaris, Macallister, Voss, Smith, & Jonas, 2015). Comprised of eight components that make up four healing environments, the OHE framework provides a lens through which to analyse the impact that spatial design can have on the healing process. These four healing environments include Internal, Interpersonal, behavioural, and external.

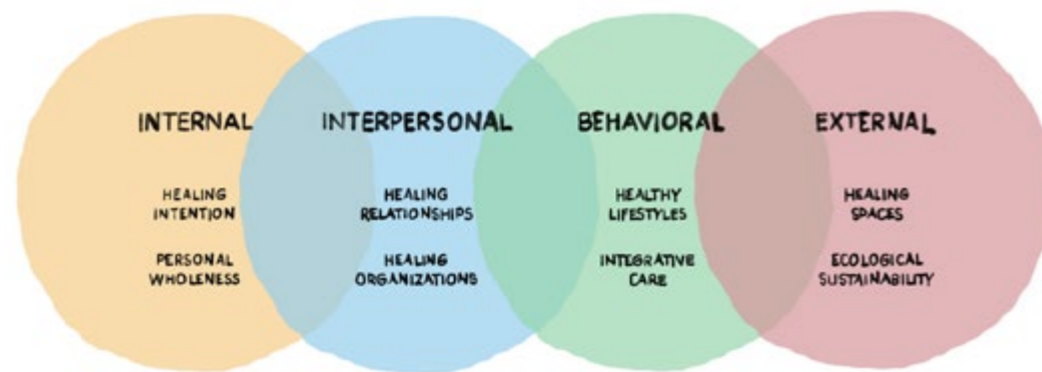


Figure 11:

Further research into Evidence-based design references have suggested that the built-environment’s influence on healing can be categorised into four primary experiences (“Healing Constructs”) which include:

- Psychological:** Where the environment plays a role in the management of reactions and emotions, minimising the effects of depression and anxiety while diminishing aggression
- Self-efficacy:** Where the environment facilitates a sense of control and harmony for the individual while promoting acceptance and adaptation to unprecedented situations.
- Social:** Where the environment facilitates the development and fostering of social connection with others
- Functional:** Where the environment supports individuals by safely facilitating essential daily tasks without the need for additional support.

To better understand these constructs, they can then be mapped in relation to the four healing environments within the Optimal healing framework (OHE) developed by Samueli Institute:

- The Psychological and Self-efficacy experience of healing relates to the **Internal** healing environment.
- The Social experience of healing relates to the **Interpersonal** healing environment.
- The Functional experience of healing relates to both the **external** and **behavioural** healing environments. (Sakallaris & Macallister, 2018)

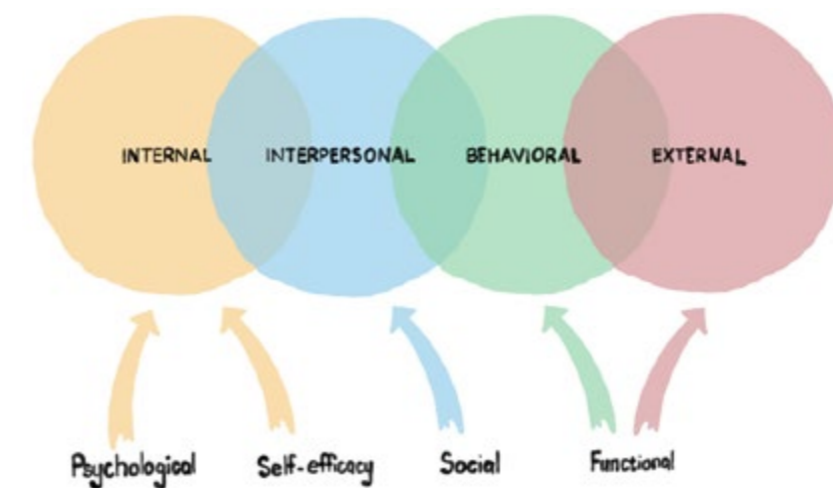


Figure 12:

Healing can be fostered by the built environment using a range of different methods. While certain scenarios allow for architectural aspects to impact the healing process directly, architecture primarily has a bearing on the behaviour of individuals which in-turn influences the experience of healing. (See figure below) The built environment has the capacity to assist or impede on the healing process but in the end, healing is a deeply personal experience and depends on the willingness and active involvement of an individual.

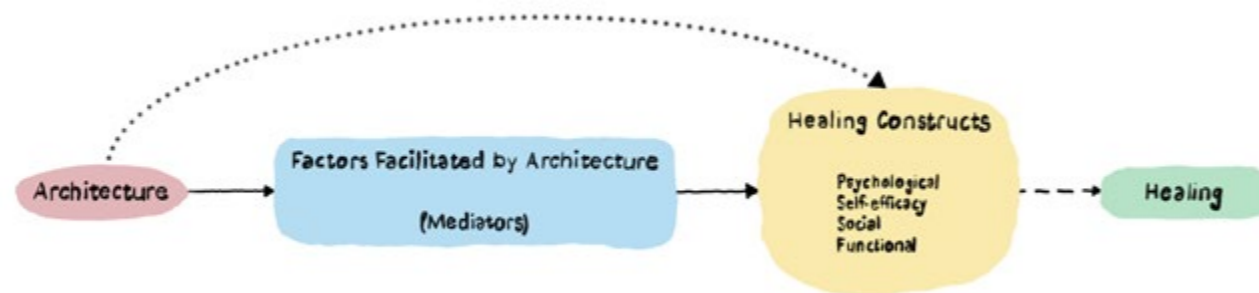


Figure 13:

“The environment cannot cause healing to occur but can facilitate engagement in behaviours and emotions that support healing; the environment can induce physical and emotional responses such as happiness, joy, and relaxation; and the built environment can enhance individual control and functionality – all of which are antecedents to healing”. (Dubose, MacAllister et al., 2016)

Based on studies completed within the Psychological, Self-efficacy, social and functional healing constructs, six environmental factors were determined to have influential capacity. These included:

1. Home-like environments
2. Opportunities to view and access the natural environment.
3. Light and its variable qualities
4. Control over noise & acoustic variables
5. Unobstructed and unrestrained environments
6. The organization of space

Psychological

The psychological aspects of healing pertain to the Internal environment of an individual and relates to the feelings and thoughts that come with self-perception and the perception of their surrounding environment. Studies have related to psychological healing have found that:

- Environments with home-like qualities have the ability to decrease levels of pain and emotional distress experienced by individuals in care facilities (Kligler et al., 2011)
- Environments that facilitate activities of leisure or visual stimulation through art aid in maintaining or reconstructing individual identity (Reynolds & Prior, 2006)
- Environments offering connections to their exterior environment, including natural views incorporating plants both externally and internally have proven to decrease stress levels and increase levels satisfaction (Lechtzin et al.,2010)
- Environments which incorporated natural lighting proved to promote hope within individuals while fostering positivity and encouraging thoughts (Timmermann, Uhrenfeldt, & Birkelund, 2015)

Self-efficacy

The Self-efficacy aspects of healing pertain to the perspective of control experienced by individuals in relation to their circumstances and emotional well-being. Providing individuals with the prospect of independence, control and autonomy, studies have shown that:

- Environments with home-like qualities (through changes in colour and lighting) promote an enhanced sense of control in individuals through familiar connections to their environment (Moore, Carter, Hunt, & Sheikh, 2013)
- Environments that are unobstructed and unrestrained, accommodating for any impairments that may limit individuals provide a sense of independence and autonomy resulting in an improved perception of self (Crews, 2005)
- Environments that effectively implement technology that allow individuals to control their environment and the activities occurring within it result in a heightened sense of independence and dignity (Erikson, Karlsson, Soderstrom, & Tham, 2004)

Functional

The functional aspects of healing pertain to an individual's ability to perform physical activities. Functionality is a crucial part in the life of an individual, and architecture has the ability to enhance or limit movement.

- Environments that have barriers on mobility limit the ability of an individual to function effectively, resulting in a diminished capacity of self-care in their environment. (Keysor et al., 2006)
- Environments that enrich an individual's ability to control their environment has been proven to enhance their well-being, which positively impacts the process of healing. (Duncan-Myers & Huebner, 2000)

While majority of the studies resulting in Evidence Based Design (EBD) approaches to healing have been completed in the context of healthcare facilities, their outcomes have produced physical characteristics that can be applied to various environments where the experience of healing can be enhanced.

2. Biophilic Design

Biophilia can be defined as the 'love' (philia) of life or living things (Bio). Described by Edward Wilson, Biophilia can be understood as the "innately emotional affiliation of human beings to other living organisms". This emotional response or affiliation however is 'innate' and 'hereditary' and exists within the genetic makeup of human beings (Wilson, 1984, 1993).

Biophilic Design is the intentional act of translating the understanding of Biophilia into aspects of design, particularly in relation to the built environment. However, due to the limited biological understanding of the human tendency to assign value to the natural environment, as well as the constraints in the human capacity to transfer the knowledge into tailored approaches of design, the objective is rather challenging. The human dependency on natural connections mirrors the reality of our evolution in predominantly natural environments. As a result, the primary developmental context for the human body and mind, was a sensory-driven world governed by essential environmental features such as sound, light, odour, weather, water, animals, landscapes, and vegetation. The modern city, resulting from an emergence of extensive agricultural, industrial, and technological developments over the last 5000 years, defines only a fraction of our history as humans. While aiding the development of modern society as we know it today, this period has not replaced the benefits obtained when actively responding to a predominantly natural environment.

As the extent to which individuals embrace values of biophilia differs greatly depending on their exercise of free will and personal choices, biophilia is widely considered a 'weak biological tendency'. Consequently, if there is inadequate nurturing and stimulation of our biophilic tendencies, they will remain dormant, weakened, and impaired. Through construction and human creativity however, we as humans are well equipped to respond to these 'weak biological tendencies' in the way we create the environments around us and are capable of facilitating or impeding on our biophilic longing for continuous contact with nature through various design choices and processes.

As our biophilic needs are an adaptive result of our biological make-up, even today, studies have shown that the fulfilment of our inherent biophilic tendencies has a direct impact on our health, well-being and productivity.

Restorative environmental design

As a result of the substantial alteration and deterioration of natural systems that occurs due to the contemporary design approaches used to create the urban built-fabric, humans are becoming increasingly separated from the realm of nature. While this separation is ultimately a by-product of a flawed design, realized by humans, we too have the ability to 'design ourselves out of it'. To do so, a paradigm shift is required, whereby further modern development should occur harmoniously with nature.

Restorative environmental design has been considered as the 'new paradigm' and aims to minimize harm to natural systems through low-environmental-impact strategies while fostering beneficent interaction between humans and nature in contemporary landscapes and buildings through Biophilic design. However, for Restorative environmental design to establish genuine long-term sustainability as the 'new paradigm', low-environment-impact and biophilic design principles need to work harmoniously together. While much has been done to address the sustainable low-environmental-impact objectives that focus on resource and energy efficiency, such as the development of specific design strategies and systems of certification (such as the LEED rating approach), a comprehensive understanding of biophilic design is yet to be fully realized. (Kellert 2005, Heerwagen 2001)

"We need and are ever more in a position to create a richer built environment, grounded in the way people actually experience the world around them. This concept could be seen as "the missing link in sustainable design" as if no one wants to BE in a building, then it will go to waste – and that that truly is unsustainable and diverges from the attempt of "green design" – Bill Browning, "Economics of Biophilic Design"

Principles of Biophilic Design

These seven biophilic patterns address the direct, ephemeral, and physical experiences of nature, and commonly incorporate natural elements such as plants and water. Embracing natural scents, sounds and breezes, these patterns strive to create direct, multi-sensory connections with the natural environment.

Nature in the Space – Direct Experience of Nature

1. Visual connection with nature
2. Non-visual connection with nature
3. Non rhythmic sensory stimuli
4. Thermal & Airflow variability
5. Presence of water
6. Dynamic and Diffuse Light
7. Connection with Natural systems

Natural Analogues – Indirect experience of nature

These 3 biophilic patterns address the indirect experiences of nature, whereby colours, objects, materials, sequences, and shapes that occur in nature are incorporated into furniture, decorations, textures and finishes within the built environment. By mimicking natural objects and shapes and using natural materials that have been altered or processed, indirect connections to nature can be formed through "analogues".

8. Biomorphic forms & Patterns
9. Material Connection with nature
10. Complexity and Order

Nature of the Space – Experience of space and place

These four biophilic principles address the organizational characteristics of space in nature. Drawing on innate aspects of the human psyche's affinity for nature, such as our intrinsic and taught desire to see beyond our immediate surroundings or our allurements to the unknown, nature has the ability to be 'designed into' our experience of space and place. (Vagal, 2020)

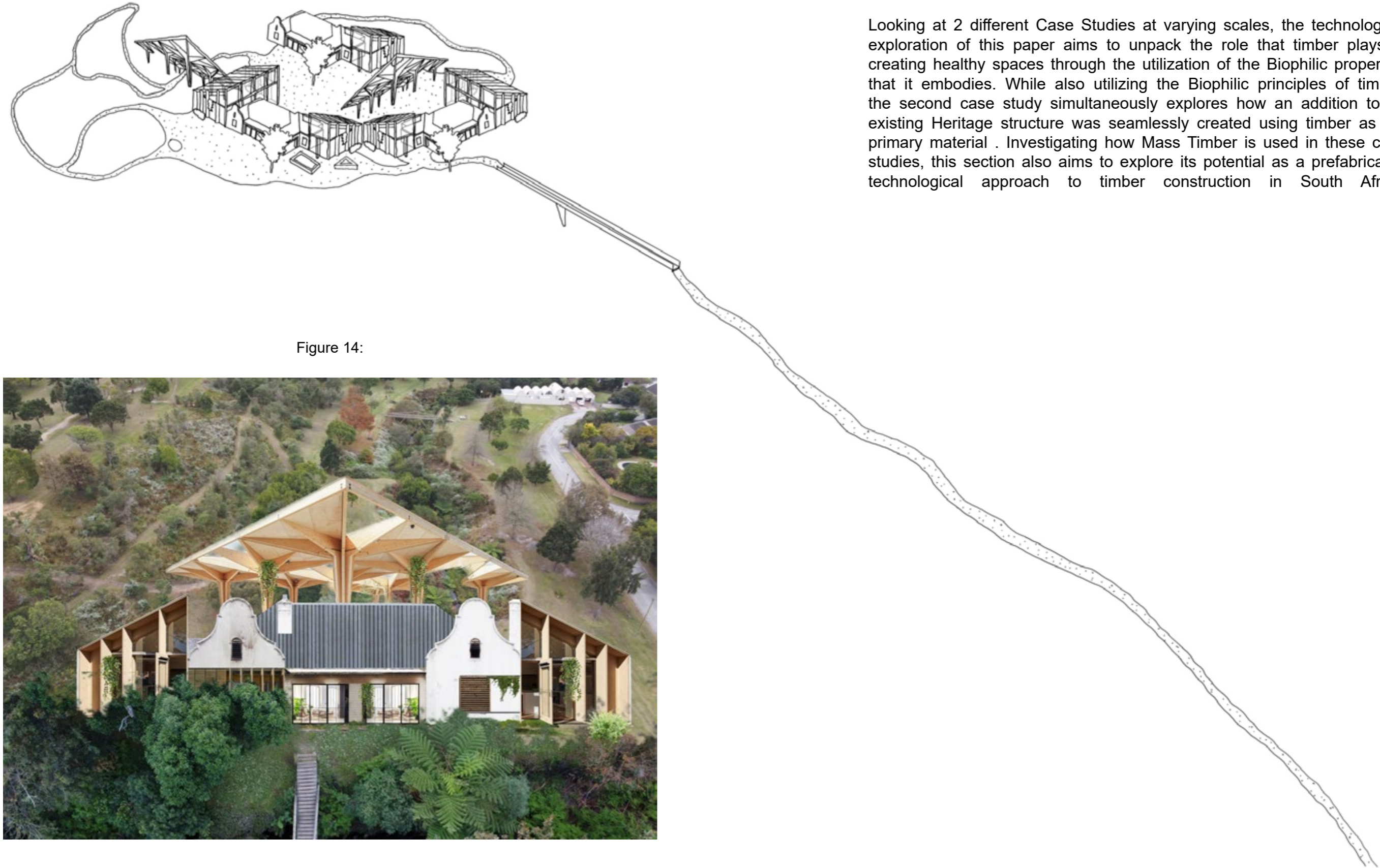
11. Prospect
12. Refuge
13. Mystery
14. Risk/ Peril

Technology

Looking at 2 different Case Studies at varying scales, the technological exploration of this paper aims to unpack the role that timber plays in creating healthy spaces through the utilization of the Biophilic properties that it embodies. While also utilizing the Biophilic principles of timber, the second case study simultaneously explores how an addition to an existing Heritage structure was seamlessly created using timber as the primary material . Investigating how Mass Timber is used in these case studies, this section also aims to explore its potential as a prefabricated technological approach to timber construction in South Africa.



Figure 14:



Case Study: Living Planet Centre



Figure 15:

This case study was chosen particularly due to its unique implementation of Biophilic design features. Serving as the new WWF-UK headquarters, the Living planet Centre, located in Woking was designed by Hopkins Architects and serves as a valuable example of how healthy spaces, using natural elements can change the way people feel, and ultimately impact their satisfaction and productivity.

While renting a 1980's office unit in a Surrey business park as their UK base, known as 'Panda house', the WWF felt constrained by the building's limited capability to accommodate for their ambitious new plans to expand and include more educational and interactive experiences for the public. When considering their options to either upgrade the existing Panda house, move to a different rented building elsewhere, or to create their own new green building to meet their new sustainable requirements, they carried out a survey in the workplace to better understand the satisfaction of employees and their experience in the working environment.

The survey was completed in the autumn of 2008 and verified much of what the WWF had already expected. The results depicted overall satisfaction levels of only 27%, proving to be less than half of what is usually expected from typical figures in the industry. It became clear to the WWF that they needed to create a new environment that was more appealing, efficient, and productive; a space that would attract people to come and visit, learn, and even work.

"Our old Panda House was referred to in the workplace results as 'dated', 'tired' and gloomy' – among other rather unflattering comments". (WWF, 2017)

After a generous donation of £5 million by the Rufford Foundation in 2006, with the condition that the money be used to construct 'the greenest building that they possibly could, the WWF continued to raise funds reaching a total of £16.5 million from charitable trusts and donors. By the end of 2011, Hopkins architects had designed the building, and Wilmott Dixon were chosen as the contractors and primary construction partner to bring the design to life . (WWF, 2017)

From the project's inception, the goal for the WWF was to create a building that was environmentally sensitive, using materials that were sourced responsibly while also incorporating passive design elements that would allow the building, in its own capacity, to aid in its own efficient use of energy while minimising operational emissions

Embracing the design limitations of having to build over an existing parking lot that had to maintain its public function, Hopkins architects designed the building to be elevated on stilts with its raised 90x40m floor area on a large concrete podium. Surrounded by various types of vegetation as well as a small wetland, the building was designed to host an exhibition space providing a 'visitor experience' for the public, a facility to accommodate educational functions, a 150-seat auditorium, and an open-plan working environment large enough to accommodate 300 people, with meeting areas and quiet rooms.

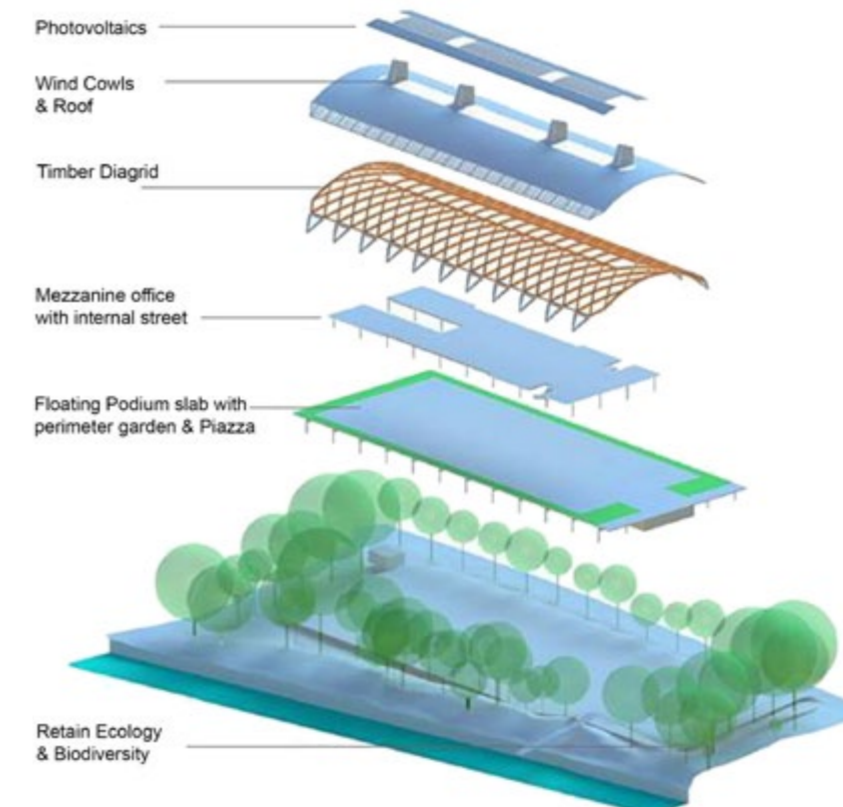


Figure 16:

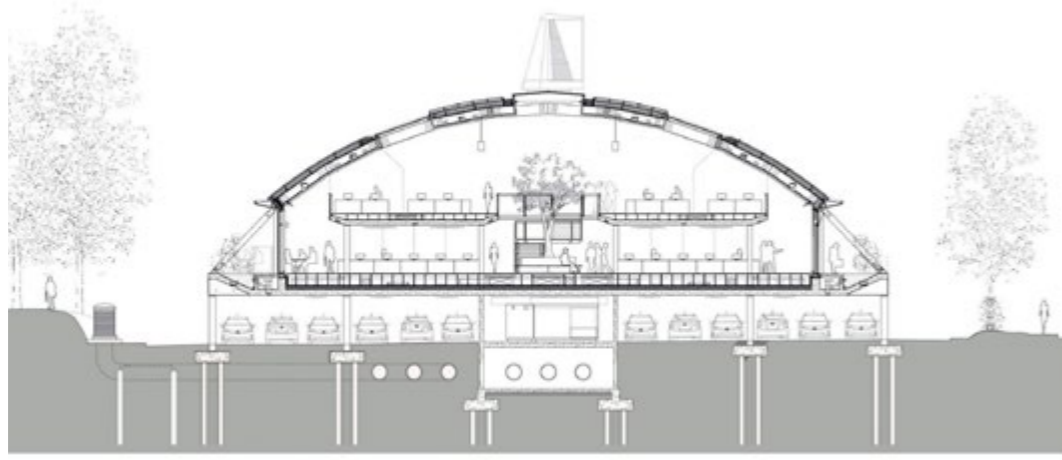


Figure 17:

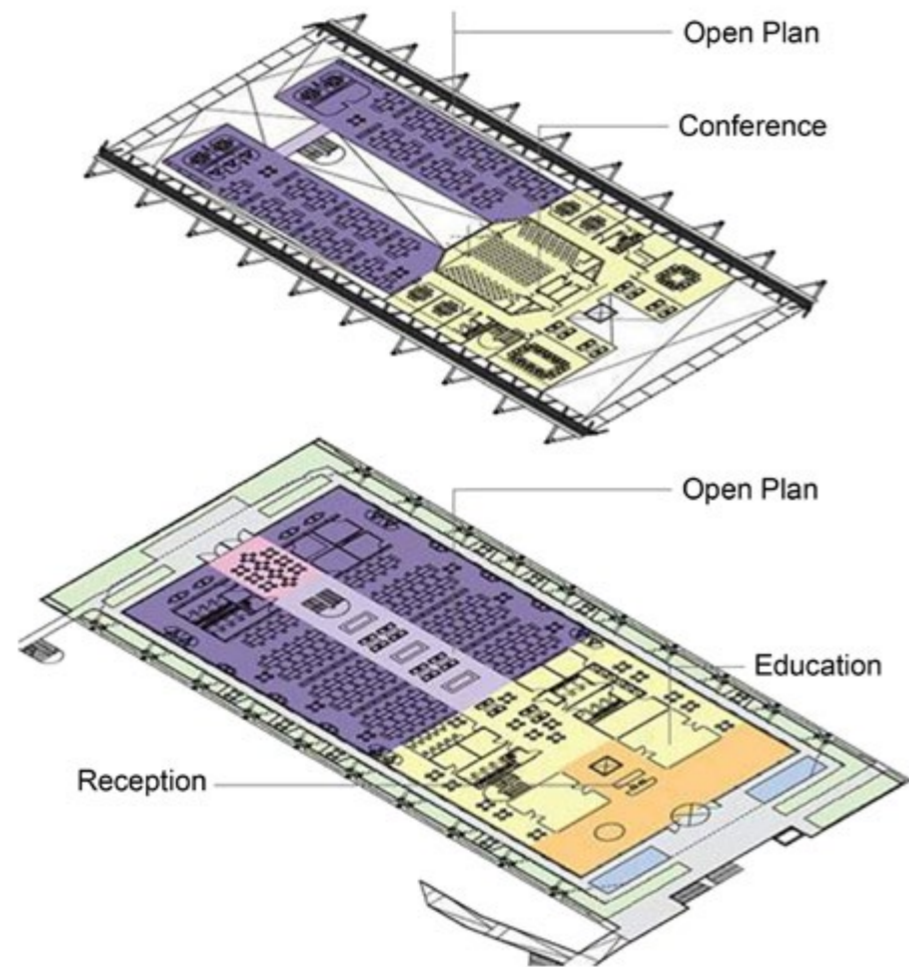
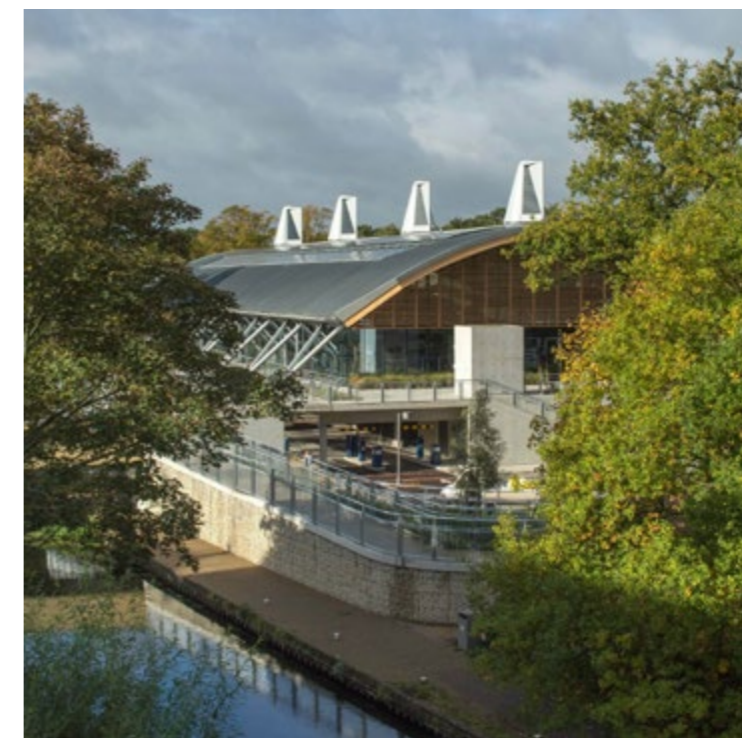


Figure 18:



Figure 19:



All Photographs by Richard Stonehouse

Biophilic Design Features

While the design embraces low-environmental impact design strategies, such as its use of passive design elements and implementation of wind cowls and solar PV panels to harness natural energy, it encompasses an overall restorative environmental approach which includes the application of Biophilic Design principles that foster beneficial interactions between its occupants and nature.

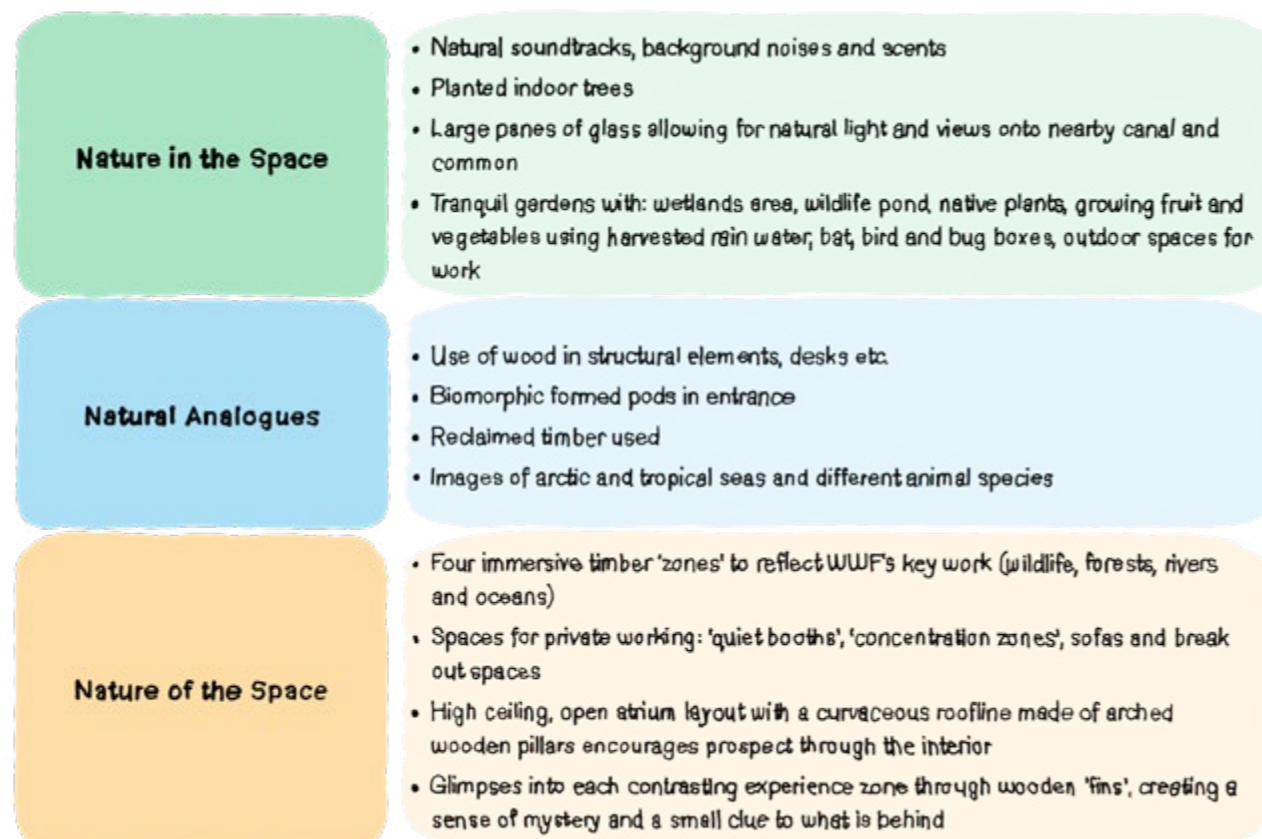


Figure 20:



All Photographs by Richard Stonehouse

Exterior

While most of the biophilic design elements were implemented in the building's interior, the exterior of the building also aims to incorporate biophilic elements, such as the design's curvaceous roofline, with its 'natural', gentle appearance, described as looking "soft and organic".

A timber slat 'brise soleil' shading system on the front and back of the building, which through computer modelling accommodates for the sun's position at different times of the day, resembles the striking aesthetics of a wooden forest cabin.



Figure 21:

Interior

The emphasis on timber as a design material becomes more evident when in the interior spaces of the structure. When entering the building, the most noticeable thing that people experience, particularly in comparison to the restricted spaces of the old Panda House, is the natural timber, the light and the space created by the timber diagrid ceiling.

When walking into the new Living Planet Centre for the first time, seeing its arched interior filled with light, a reviewer for "Architects Journal" described their experience as "stepping into a gigantic treehouse." While only roughly 25% larger than offices used previously by WWF, it feels far more spacious thanks to the bright open layout and central atrium spaces that further emphasize the height of the curved ceilings.



Figure 22:

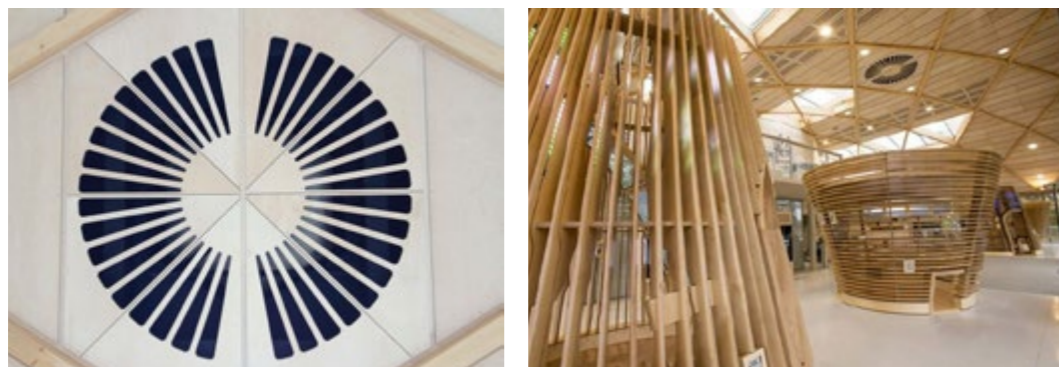
Timber use in the building

Timber, being a primary structural element, particularly in the roof, played an active role in facilitating biophilic qualities that transform the environment into a positive healthy space. Of all the 900m³ of Timber that was used in the construction of the building, 100% had FSC (Forest Stewardship Council) Certification which ensures that the forests where timber is sourced is managed in a socially and environmentally responsible manner. Various timbers were used in the construction process to accommodate for various functional and aesthetic requirements including Spruce (European whitewood), Birch, Ash, and Larch. (WWF, 2017)

Spruce being the primary timber used, was utilized in the 828 prefabricated glulam ('glued laminated timber') beams that were assembled on site using over 7,200 bolts to create the diagrid roof structure. Spruce was also used to create the LVL ("Laminated veneer lumbar") members, creating stronger, economical alternatives to other timber that has dimensional limits.



Birch was used in the construction of wall and ceiling plywood panelling as well as in cupboards, internal doors, and other joinery. The four unique WWF experience zones representing forests, oceans, fresh water, and species also consisted of CAD generated birch-ply constructions.



All Photographs by Richard Stonehouse

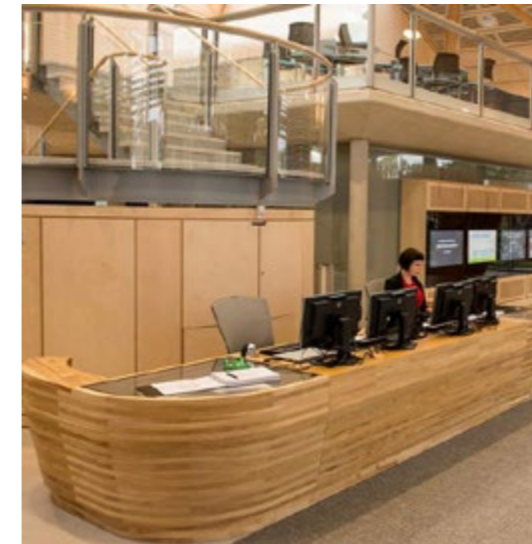


Figure 23:

Timber Diagrid Ceiling

The main attraction of the structure is its ceiling with its unique "grid shell" design that spans the entire length of the building. Using the intrinsic strength understood by the concept of triangulation, the diagrid structural roofing system criss-crosses to create a barrel-vaulted roof, free of pillars. Influenced by Richard Buckminster Fuller's geodesic domes, this technique has become a "hallmark of 21st century modernism" as mentioned in an article by Architect Magazine. Along the central and side lengths of the diagrid, skylights are positioned in the cell-like openings to allow for natural lighting to flood into the space below. The diagrid structure is constructed out of 'Glulam' Members – a form of mass timber where smaller timber pieces are glued together, creating beams that are larger, stronger and can span further



Figure 24:

For curved elements such as the balustrade railings located on the interior of the building, as well as the reception desk with its curved-edge, **Ash** was selected as the timber of choice .

While curved glulam beams were initially considered to create the arch of the barrel vault diagrid, the design team found that by using straight glulam beams connected by slightly angled steel joining plates, the effect could be achieved at a more affordable cost. As the diagrid roof needed to span the entire length of the building, the design team also had to exchange their initial idea of a smaller grid for a larger one to accommodate for the high cost of the steel joining plates that connect the glulam members. As a result, combining longer members with fewer connection nodes decreased the cost significantly. (WWF, 2017)

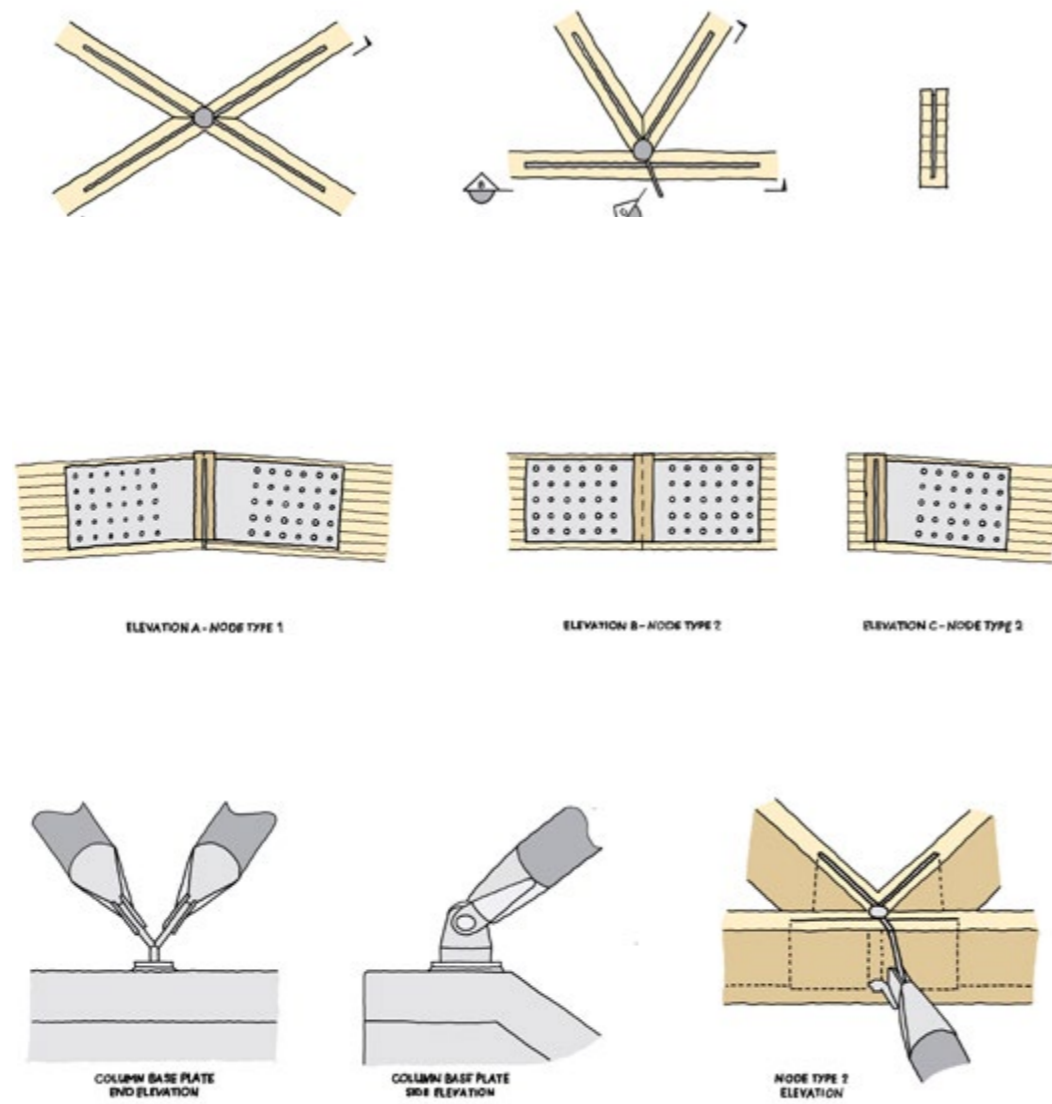


Figure 25:

Figure 26:



While the plan was always to have a column-free space below the barrel-vaulted roof, which was ultimately achieved by the success of the glulam diagrid, it did not come without its own set of challenges. Having a significantly thin shell, the structure would inherently have low thermal inertia, affecting the efficiency of heat retention as well as acoustics. (WWF, 2017) To address this issue, Energain tiles were used, being placed neatly behind the panels of birch ply that were positioned inside the diamond shapes of the grid structure, maximising heat absorption during the day while allowing for slow release at night or on cold days. Not only was the glulam diagrid roof maximising the use of computer aided design, bring prefabricated in parts that could easily be assembled on site, but it is also unique in the way that it was 'designed for deconstruction' and can be disassembled and reused if the building were to move or expand.

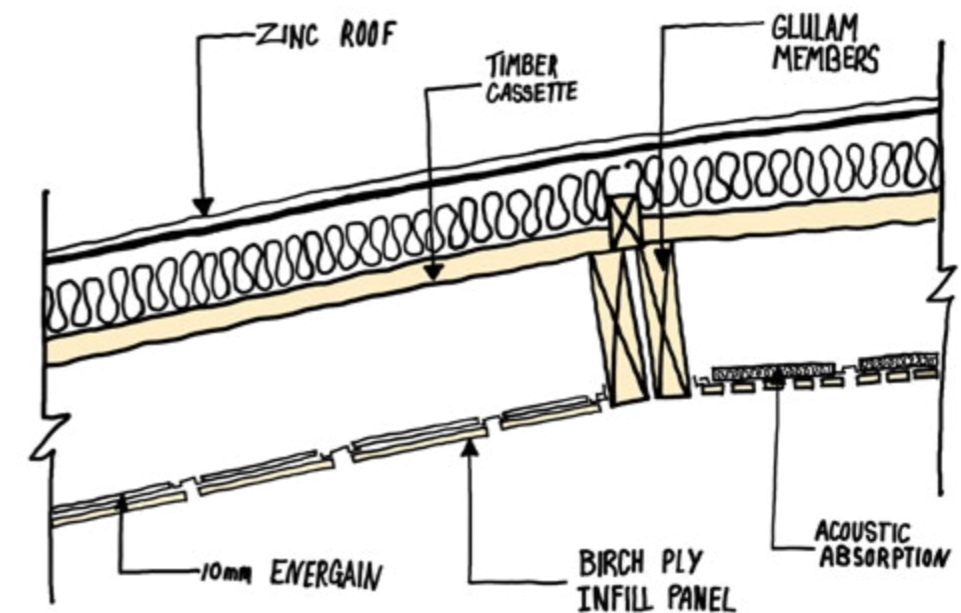


Figure 27:

Case Study: Lea Bridge Library



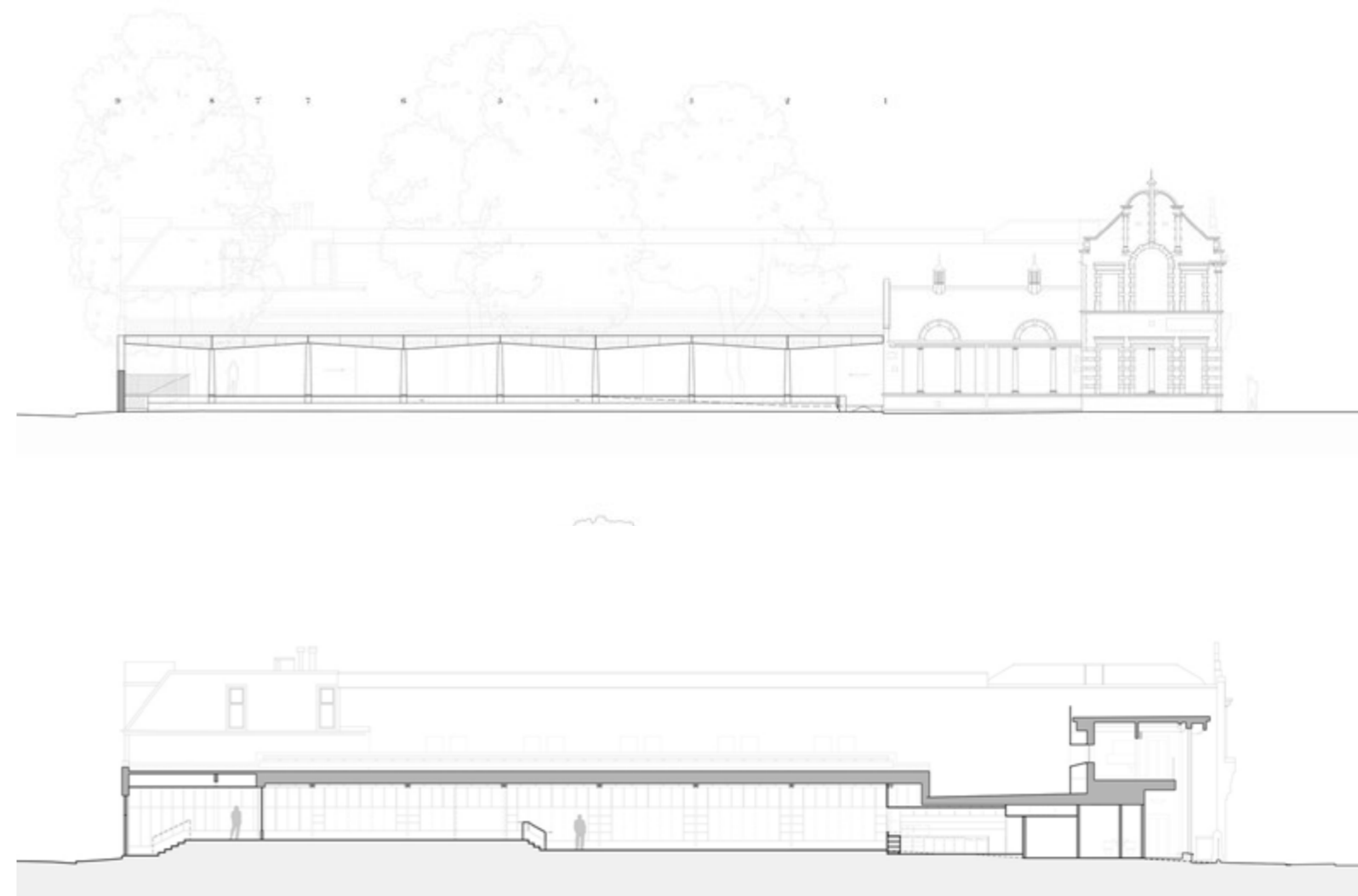
Figure 28:

Much like my own masters dissertation which engages architecturally with a graded heritage structure through principles of adaptive reuse, the Lea Bridge Library Pavilion too serves as an example whereby an existing structure, an Edwardian Library Located in the Borough of Waltham Forest, was extended and revived. Using timber as a strong conceptual element through both aesthetic and structural implementation, the project aimed to improve the connection between the library and its neighbouring garden .

Located behind the library with it's Edwardian red-brick façade, the new extension was designed as a hub for culture and community whereby socially cohesive activities and events for residents could be facilitated .Providing a space to learn, work, gather and socialize, the Lea Bridge Extension aims to empower local residents through opportunities of shared experience.



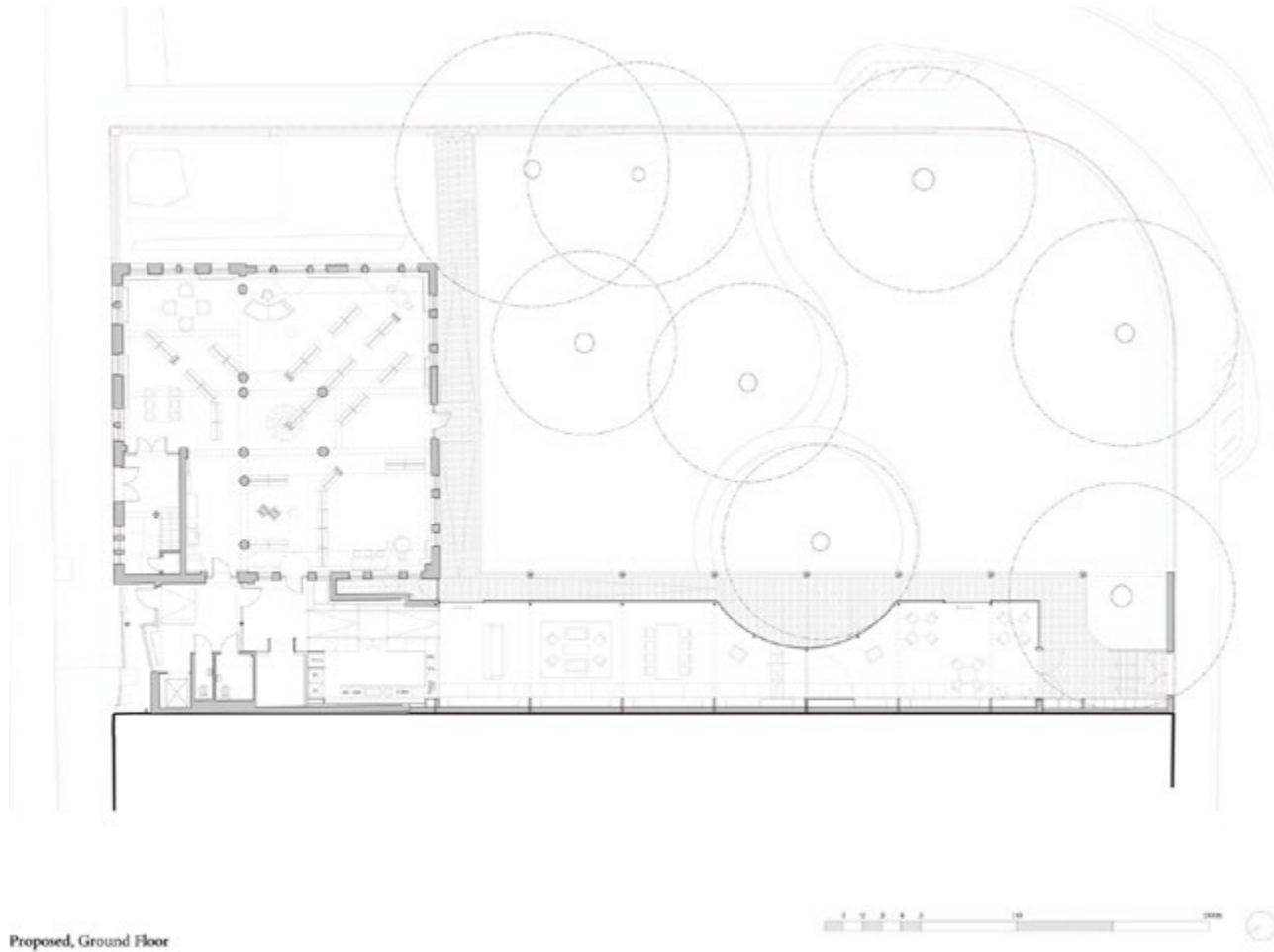
Figure 29:





As the heritage of the neighbouring garden was also considered in the design, plans to rejuvenate the garden were also implemented. To minimize the ecological impact that the extension would have on any of the existing trees, the 250m² pavilion was secured by a structural spine to an existing parti wall on the west border of the site. In doing so, the design situates itself harmoniously together with several mature trees located on site, “pinching” the floorplan and puncturing the roof where necessary to accommodate for the trees, and stepping up the floor where roots need to be protected, particularly near the centre of the extension’s length where a lime tree’s root system needed particular care. (Studio Weave, 2019)

Figure 29:



Proposed, Ground Floor



In anchoring this “spine” to the existing parti wall, high-strength laminated veneer Lumber (LVL) beams span from the existing wall to the red cast concrete colonnades at regular intervals, supporting the roof structure above while securing it to one side. This allowed for minimal impact on the existing trees and their roots while structurally repurposing an existing wall to anchor the extension to.

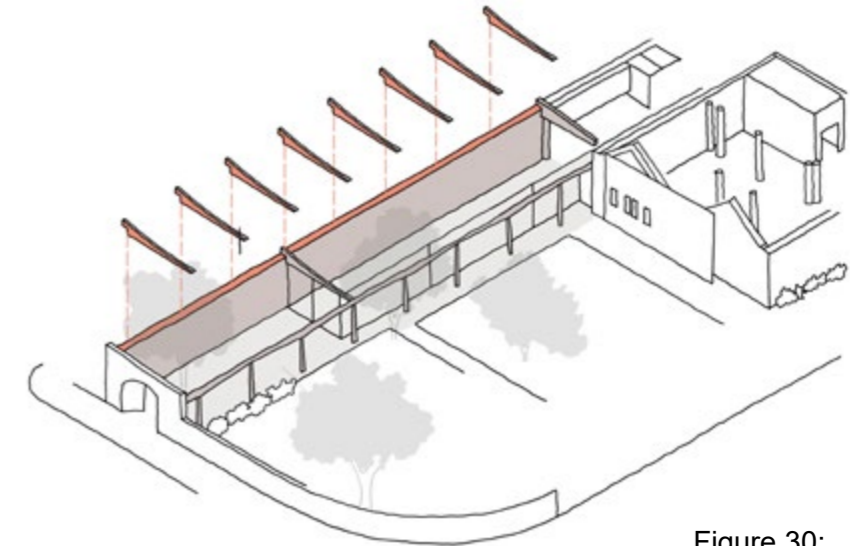


Figure 30:

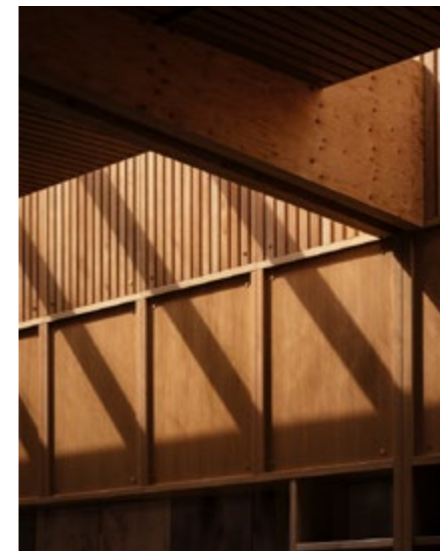
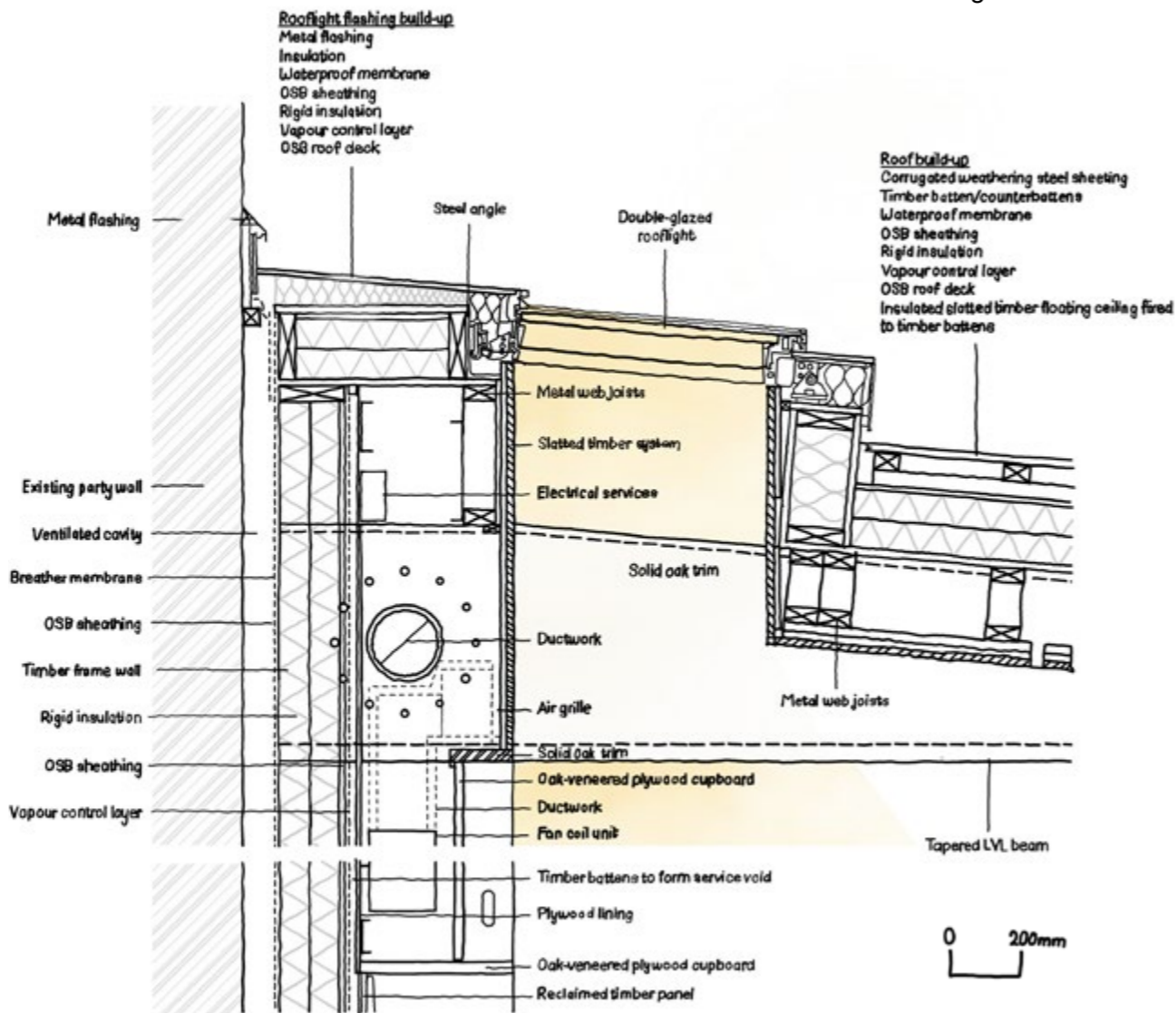
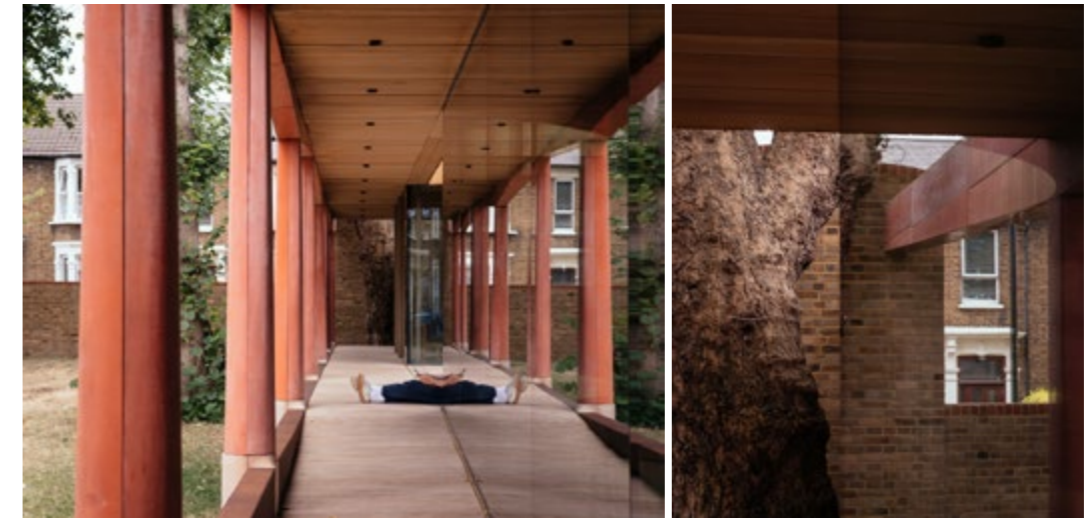




Figure 31



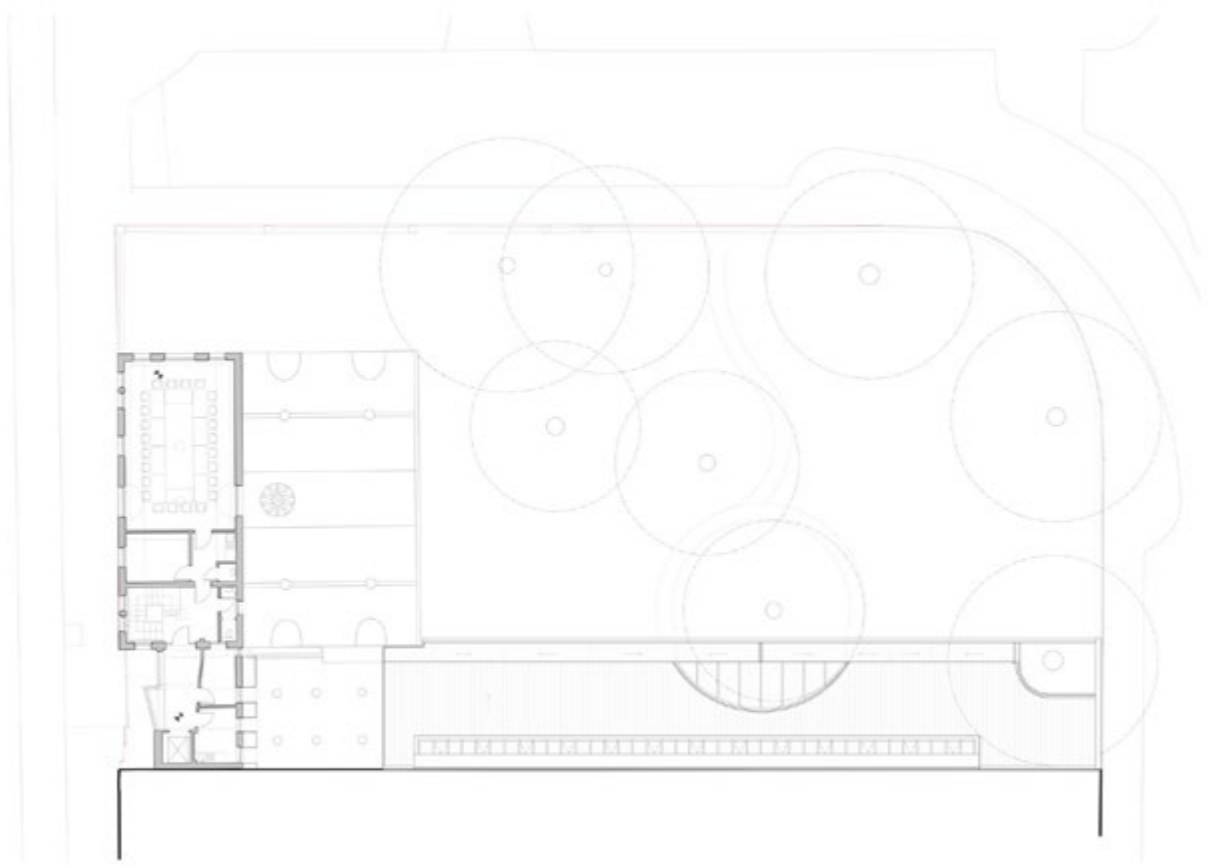
The precast concrete colonnades which support the LVL beams, act as a backdrop to the garden when viewed from the street elevation, and due to their colour, matching the red brick of the graded heritage structure, draw minimal attention from the listed building while concealing the draining pipes that channel rainwater back into the root system of the trees below.



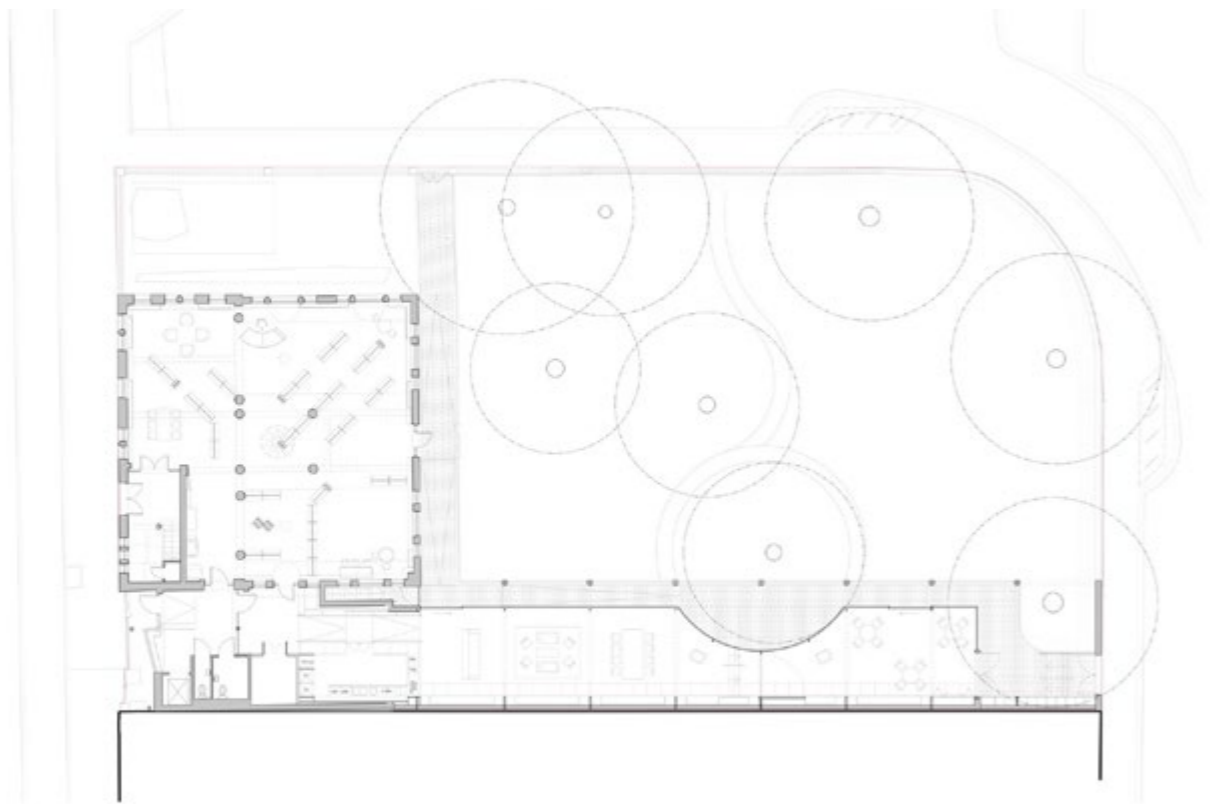
Selected by the architects for its long lifespan and sustainable qualities, the LVL beams are primary structural elements, yet blend in seamlessly with warm interior of the multi-purpose space, which is lined with over 25m³ of locally salvaged timbers including Poplar, Holm Oak, Sequoia, Turkey Oak, Ash, Chestnut and others that were salvaged from public parks and streets around London, crafting a gentle connection with the neighbouring garden while reducing the project's carbon footprint. (Studio Weave, 2019)



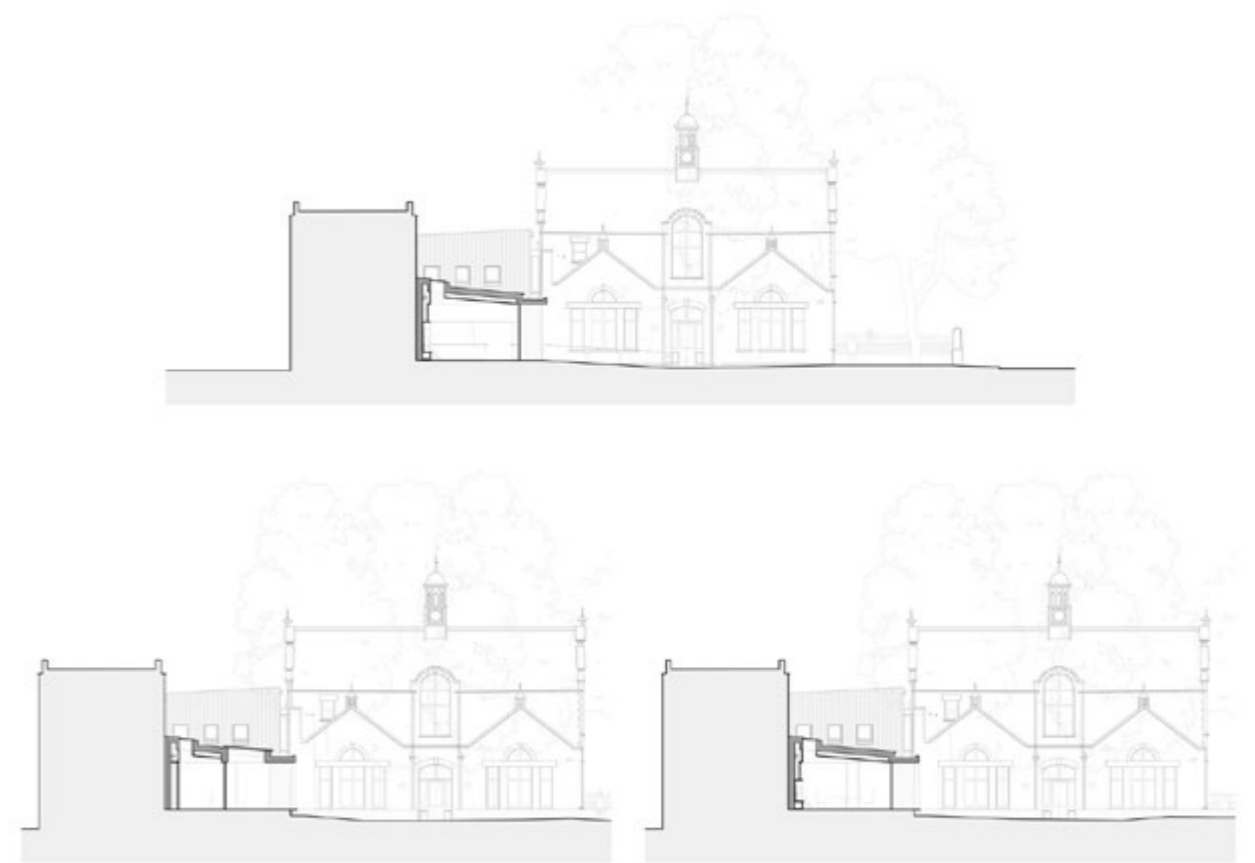
All Images by Jim Stephenson



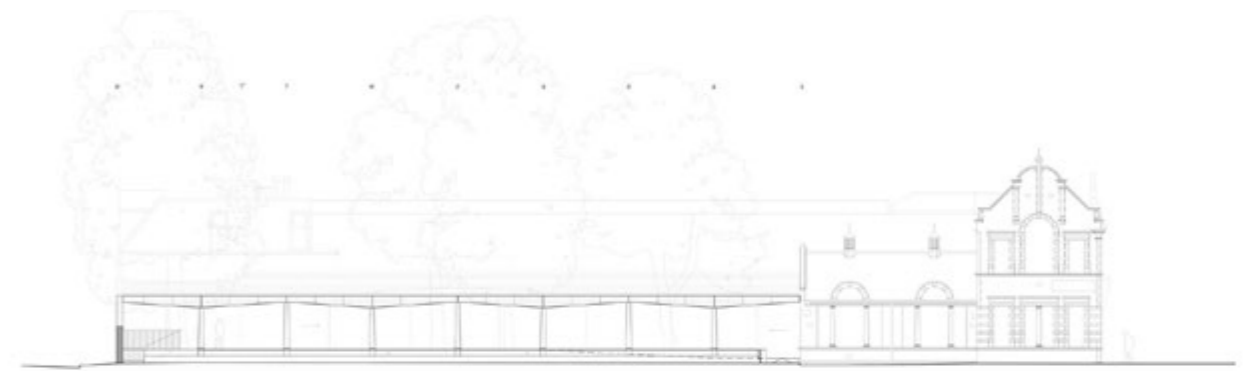
Proposed, First Floor



Proposed, Ground Floor



Proposed, Sections



Proposed, Elevations



Mass Timber

Timber has been used as a material for construction since the beginning of human civilization. However, the primary materials used in the constructions of most buildings today are steel and concrete, contributing to large amounts of CO2 emissions globally. While concrete and steel have become favourable material choices due to their strength and material properties, the technology behind timber construction has recently seen promising progress, particularly in the development engineered wood technology commonly referred to as Mass Timber. Not only have new timber products like cross laminated timber (CLT), laminated veneer lumber (LVL) and glue-laminated timber (GLT/ 'glulam') proven to be beneficial in their environmentally conscious methods of construction, but due to their increased strength and highly variable dimensions, they are able to compete with steel and concrete in several methods of application. In addition, other advantageous benefits such as their pre-fabrication and assembly on-site have proven to cut costs and time while also decreasing material waste compared to other existing methods of construction. (Vistek, 2021)

By using mass timber in construction, core structural elements can now be made of timber, incorporating exposed features and natural visuals as part of the completed architectural product. Not only do solid structural timber elements provide a warm ambiance and air impermeability, but through the intrinsic biophilic properties that timber possesses, structures made of mass timber can ultimately provide benefits to health, creating positive and productive spaces for those occupying them.



Figure 32

The manufacturing of prefabricated mass timber elements occurs with extreme accuracy and tight precision thanks to Computer Numerical Control (CNC) technology, resulting in stable, airtight structures that allow for easy installation of electrical and mechanical components in pre-drilled openings.

By utilizing collaborative software that allow multiple disciplines to work together from a project's inception, a structure can successfully be planned and manufactured while the ground works are completed, resulting in a 'just in time' manufacturing approach, minimising the time spent on site. As much of the work can be done off-site in safer, controlled factory environments, risk is ultimately reduced. (Vistek, 2021)

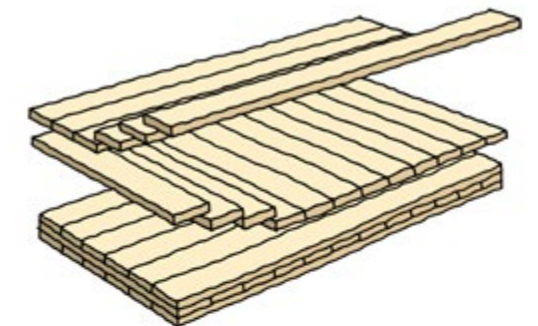
Generally, no more than 10 people are required to assemble and install a mass timber building, and with minimal training, new installation workers can easily develop the skills needed to operate the simple, easily procurable tools. As a result of fewer on-site workers and increased pre-fabrication occurring off-site, fewer on-site tools are required, resulting in a working environment that is safer and quieter. Other issues that are experienced in traditional construction methods can also be minimized, such as a reduction in the number of deliveries to site, which ultimately alleviates congestion that usually impedes on stages of the construction process.

While still a new technology in the South African context, glue-laminated timber (GLT) and cross laminated timber (CLT) have established themselves as potential material choices for architectural projects.

CLT

Cross-laminated timber (CLT) is a large-format engineered wood panel, made from layers of solid sawn lumber. Each lamella of boards is typically oriented with the wood grain perpendicular to the adjacent layer, to provide a geometrically stable and structurally rigid sheet. A CLT plate consists of an odd number of lamella, typically three, five or seven layers.

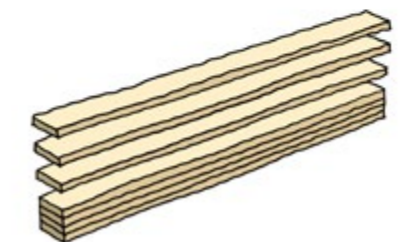
CLT is well suited to wall, roof and floor structures.



GLT

Glue-laminated timber (GLT), or Glulam, consists of lumber laminated in the same direction, to make a building component. Having the timber grain oriented the same way provides direction-specific structural performance, also referred to as anisotropic material behaviour.

GLT is typically utilised in beams, columns and posts, header structures and trusses.



Mass Timber Industry in South Africa

Consisting of over 1.2 million hectares of commercial plantations, the South African Forestry Sector utilizes only 1% of the national land mass. This does not seem like much when compared to countries that are rich in timber, such as those located in Europe and north America.

When sourcing raw material for structural timber in South Africa such CLT and glulam, pine trees are usually considered the primary choice. Throughout various regions of South Africa, several species of Pine are collectively forested as SA pine. While chosen for its high strength in structural use cases, pine is a softwood, making it lightweight and easily processable by industrial machinery.

Structural timber is often also produced using Eucalyptus lumbar. Being stronger and more dense than pine and ultimately wearing better over time, eucalyptus is typically more expensive. While it is generally believed that South African Timbers are of sub-par quality and unfit for structural use, studies have proved that the variance between European timbers such as spruce (*Picea abies*) and pine from South Africa (*Pinus radiata*) was minimal when manufacturing engineered wood products such as CLT. While European spruce is minimally better than SA pine in its bending strength and elasticity, SA pine has the advantage of being able to undergo a pressure impregnated treatment that aids in shielding against fungus, mould, and pests.

In May of 2020, grades 7, 10 & 14 of SA pine timber were officially granted approval by the SABS for use in CLT panel manufacturing. This initiated new manufacturing opportunities, with potential to experiment with SA pine in the implementation of CLT as a new structural construction material in South Africa. While 3 years have passed since the successful approval of SA Pine for CLT manufacturing, my research has concluded that only 2 manufacturers and suppliers of CLT can be found in South Africa. These include X-Lam and Mass Timber Technologies (MTT) located in Cape Town and Johannesburg respectively, who both supply commercially available CLT and glulam products throughout South Africa.

Following a universal manufacturing process that applies to the production of most of mass timber products around the world, the diagram on the right depicts the typical steps involved in the transformation of raw timber into processed structural building materials.

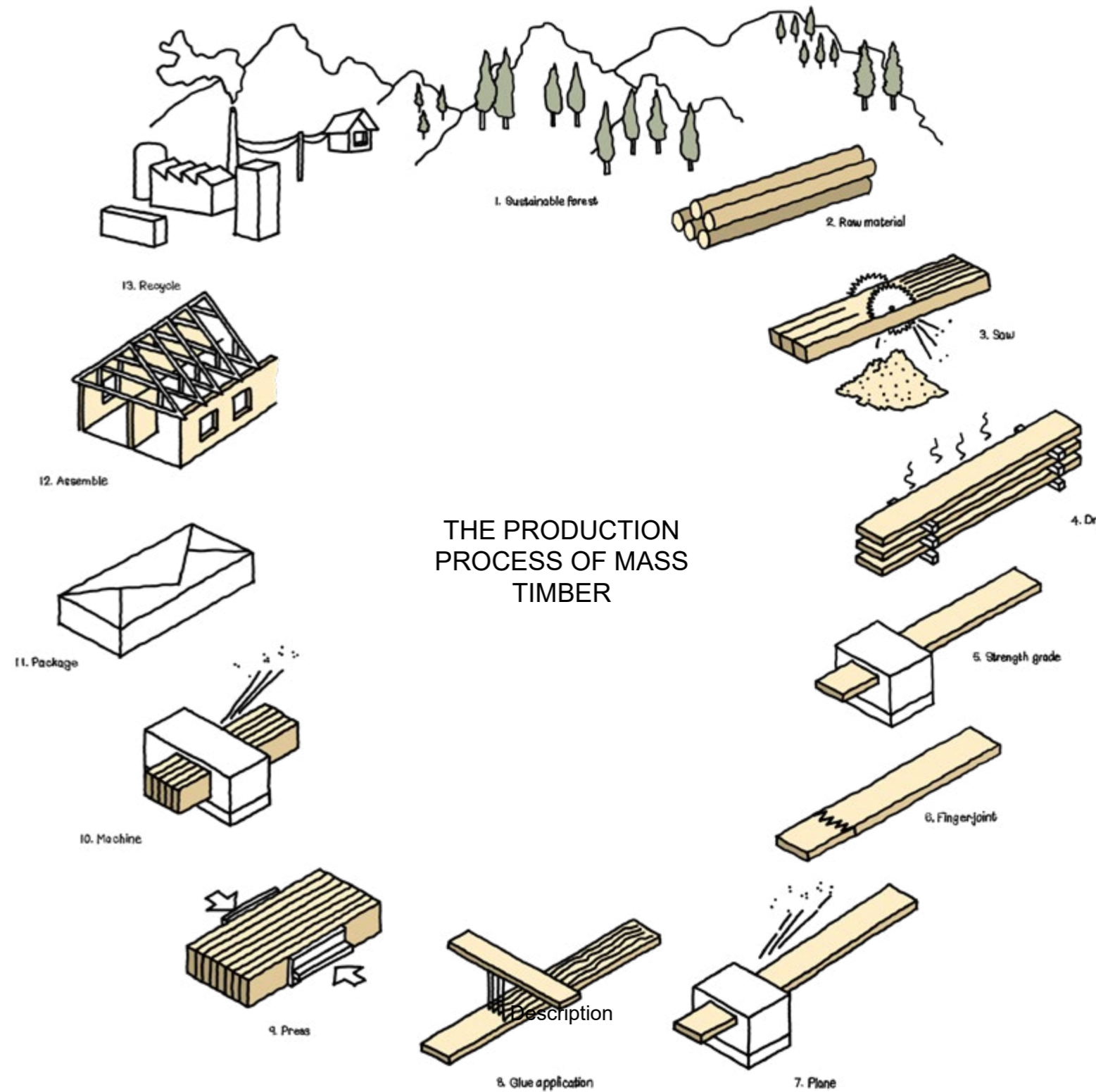
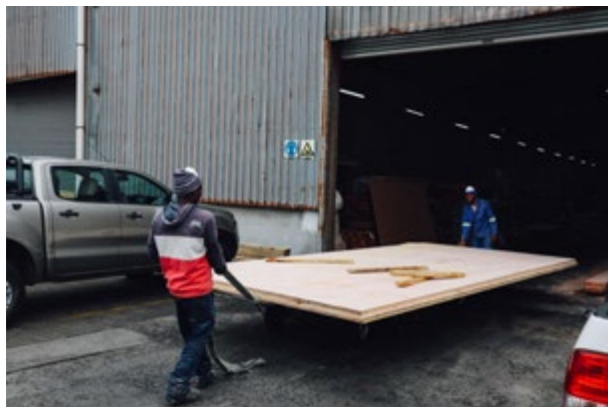


Figure 33:

Figure 1:



Part II
Design

UNDERSTANDING THE EXISTING

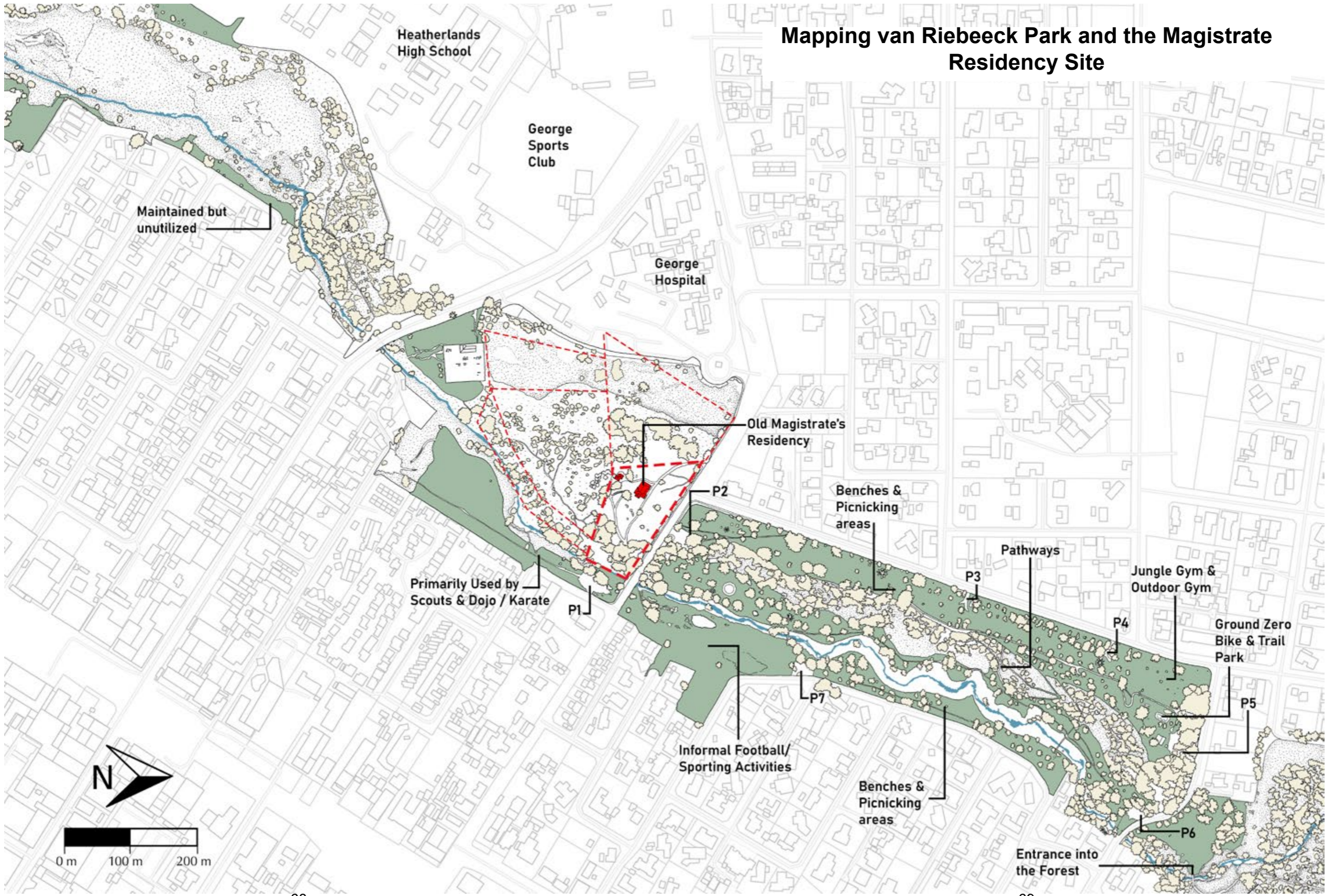
Mapping of Broader Context over Time



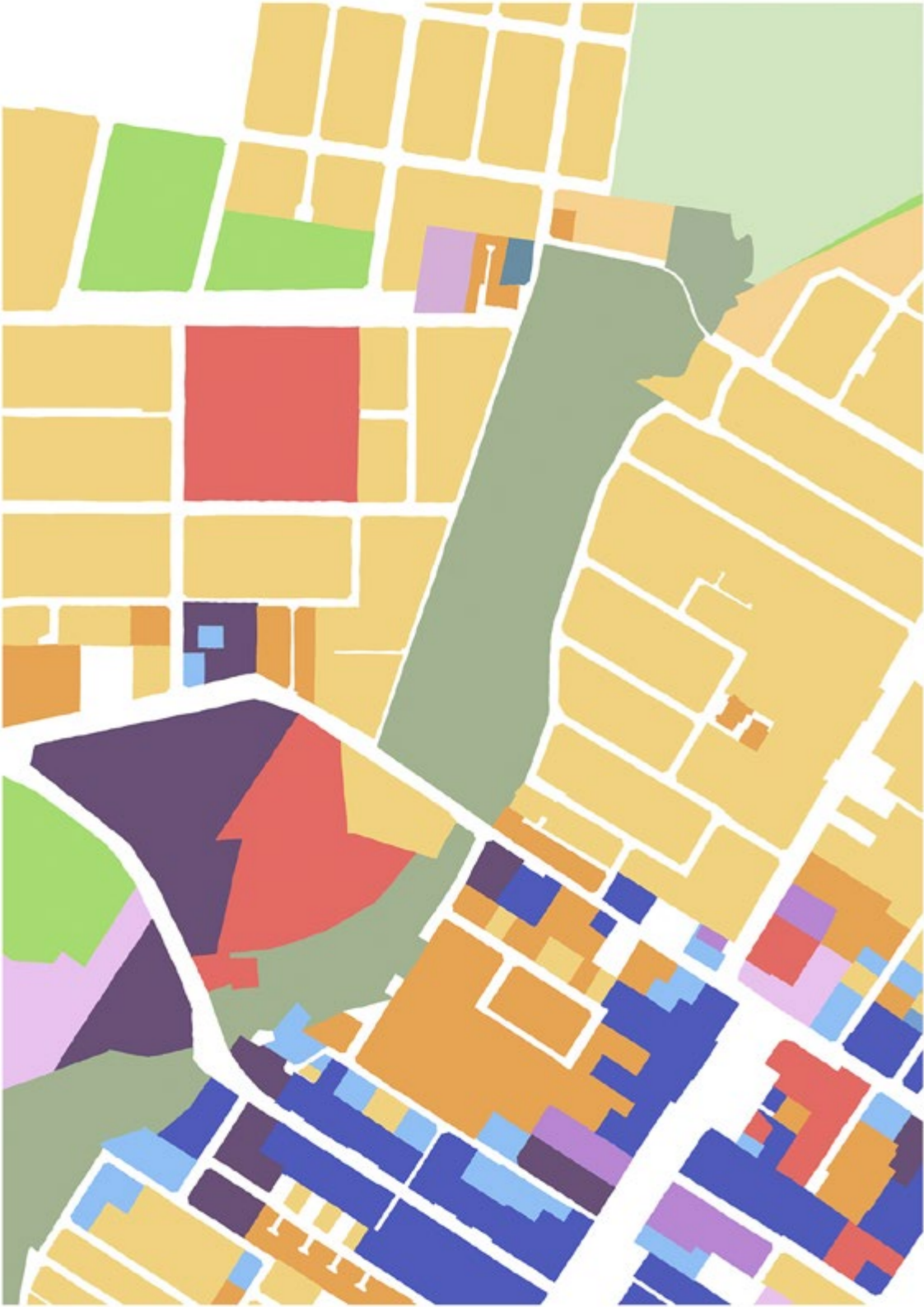
Aerial study of the the magistrates residency site between 1957 and 2022



Mapping van Riebeeck Park and the Magistrate Residency Site



Zoning around van Riebeeck Park



Further Refinement of Zoning

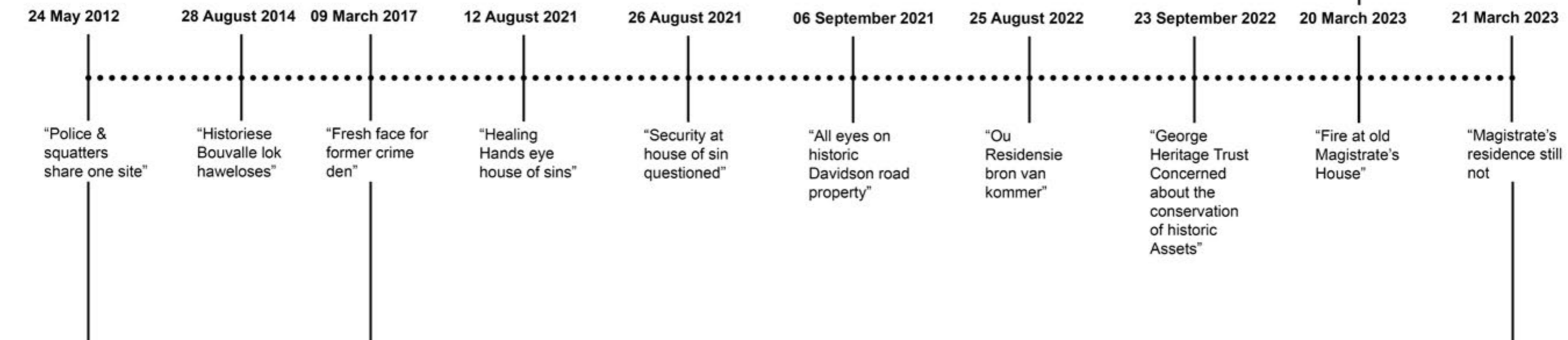


0 50 100 200 300 400 500 METERS



Magistrate House Timeline

After being left abandoned in the late 1990's, the old Magistrates' residence has appeared in the George herald multiple times between 2012 and 2023. The public discussions around the site of the residence generally addressed the issues of crime and drug related incidents that occurred within the abandoned structure. Punctuated by hopeful articles whereby temporary interest is sparked in the ideas of developing the site, majority of the discussions however highlight the declining nature of the structures and landscape due to the lack of intervention by its custodians, the department of public works.



Visual historical record of old magistrates residency & van Riebeeck Gardens



Old Magistrate's House - Matthew Bennett



Photo by Lee Thompson - Circa 2000



Photo by Lee Thompson - Circa 2000



Photo by Lee Thompson - Circa 2000



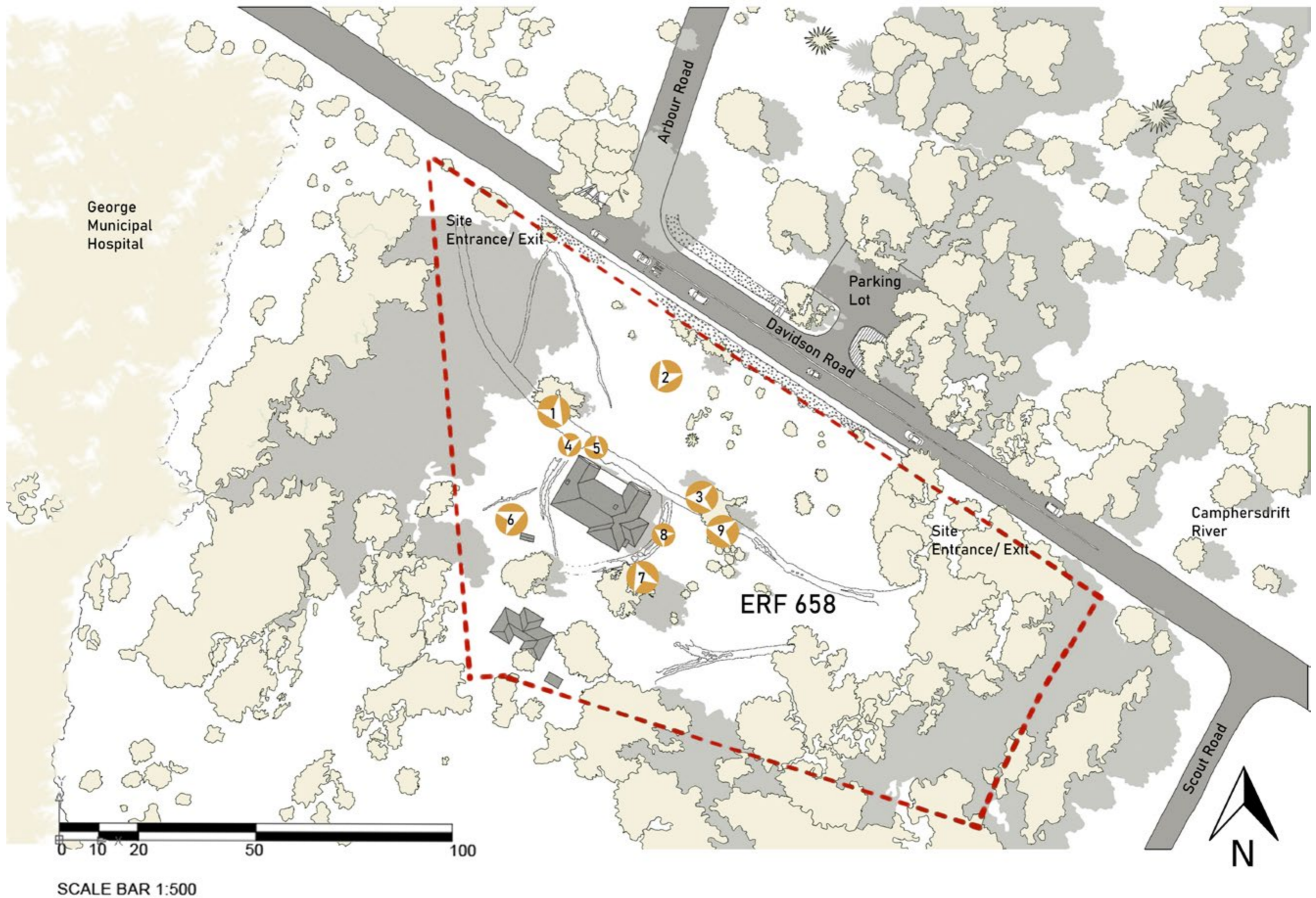
Photo by: Arthur English - 1960's



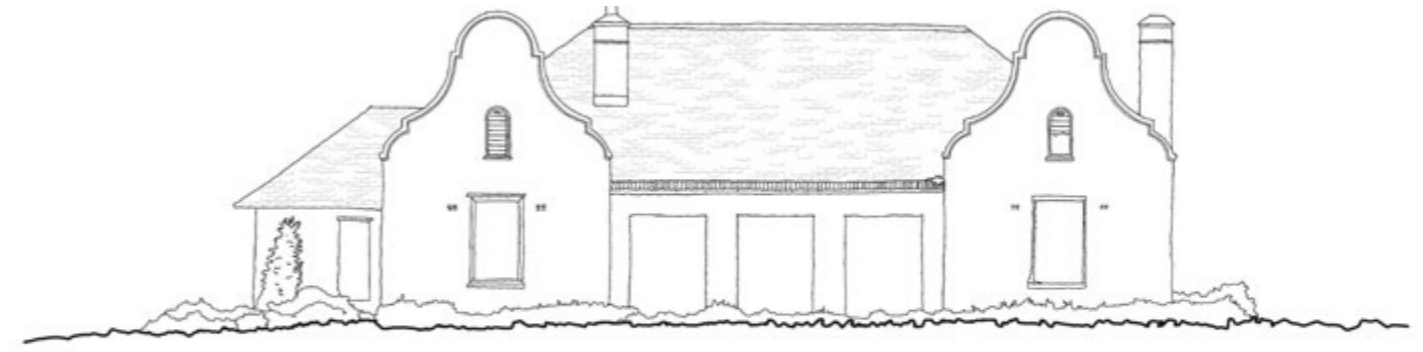
Photo by: Dr. F. le Roux - 1960's

Exploring historical imagery of van Riebeeck Gardens from the 1960's, it becomes clear that the gardens were well manicured, containing colourful flowers and water features which no longer exist today. As the gardens were located perpendicularly to site of the Magistrate's residence, it appears almost as if they were an extension of the Magistrate's own property, although this was not the case.

Photographic Study around the old Magistrates Residency







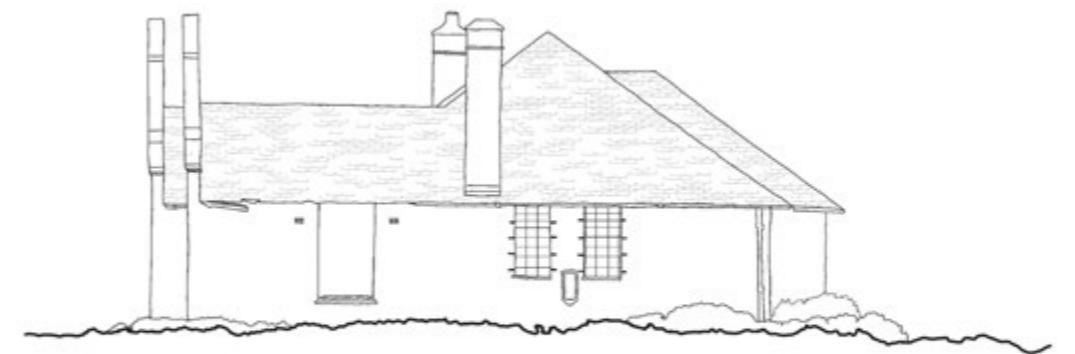
North Elevation
Scale 1:100



South Elevation
Scale 1:100



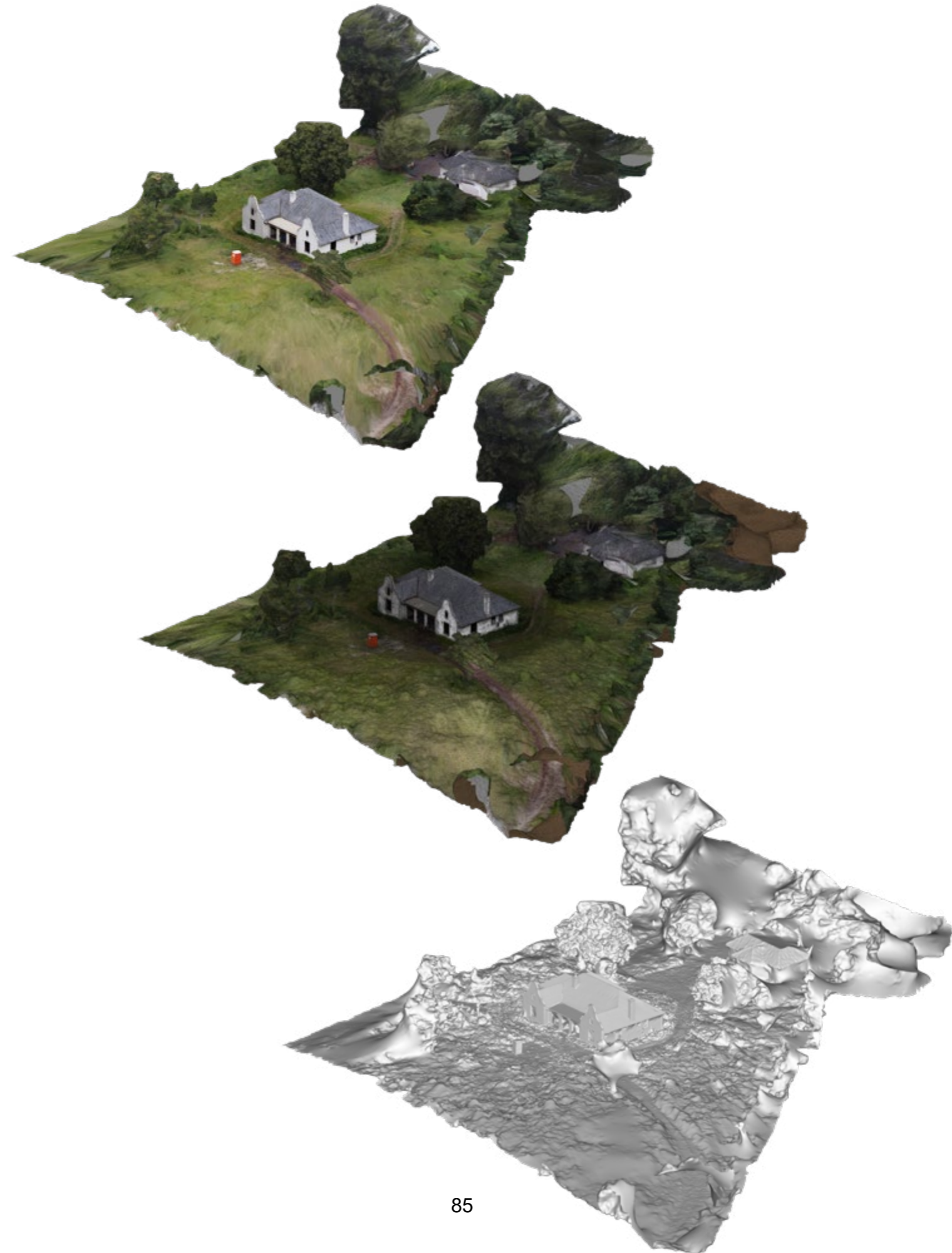
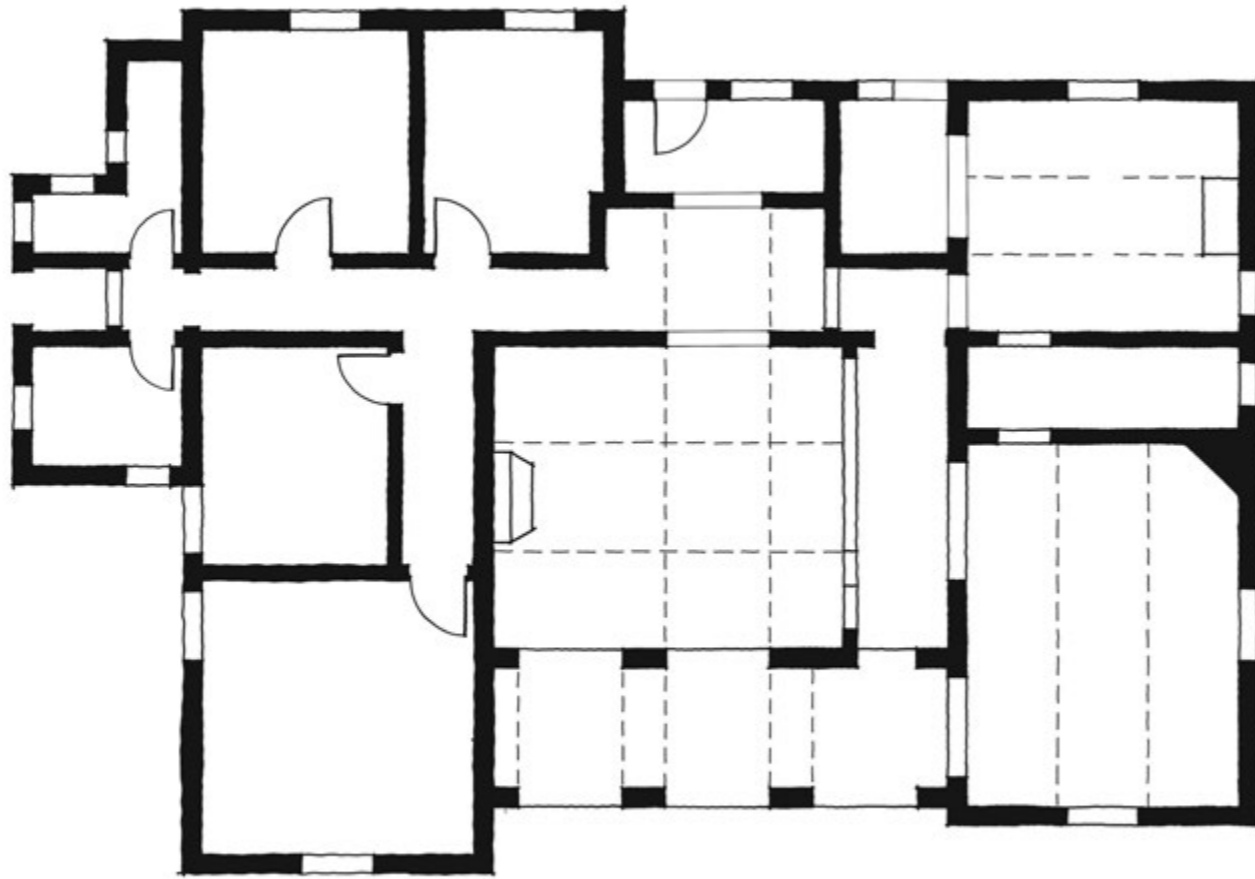
West Elevation
Scale 1:100



East Elevation
Scale 1:100

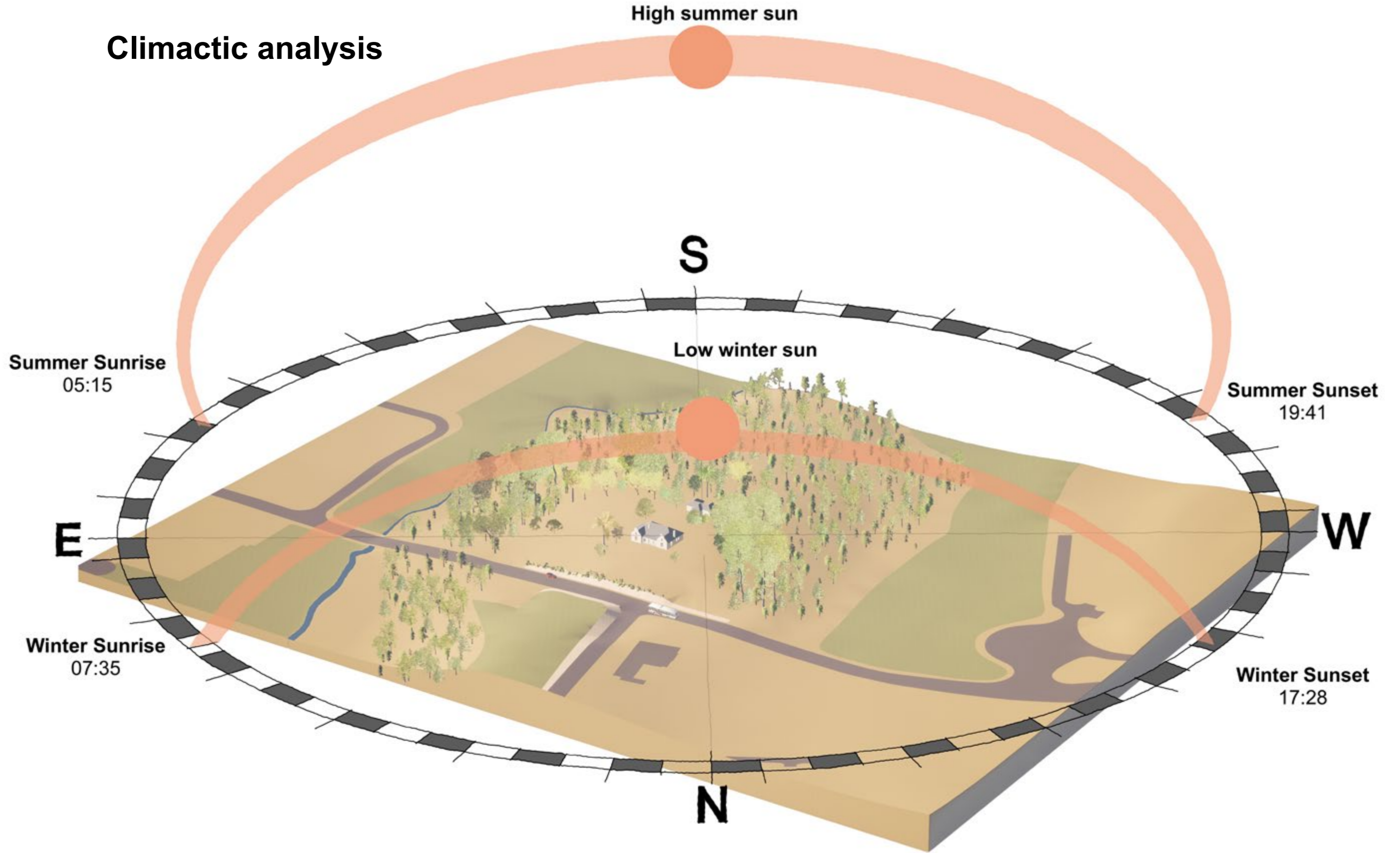
Measuring up the Residence

After visiting the George Municipality to request access to the floor plans of the existing structure, it was made clear that permission from the owner, the department of public works, was required. Despite countless attempts to contact the department, no contact could be made. To get accurate dimensions of the existing structure, I decided to use the process of photogrammetry to scan in the structure using my drom. This allowed me to capture a 1:1 scale 3D model which I converted to a point cloud, providing me with an accurately scaled digital model to inspect when necessary.



SITE RESPONSE

Climactic analysis



Site Study

Walking Routes

Routes through and around the site, taking visitors or passersby on a restorative walk along the river, while serving as a connection point for new potential points of entry to the site

Adaptive Reuse

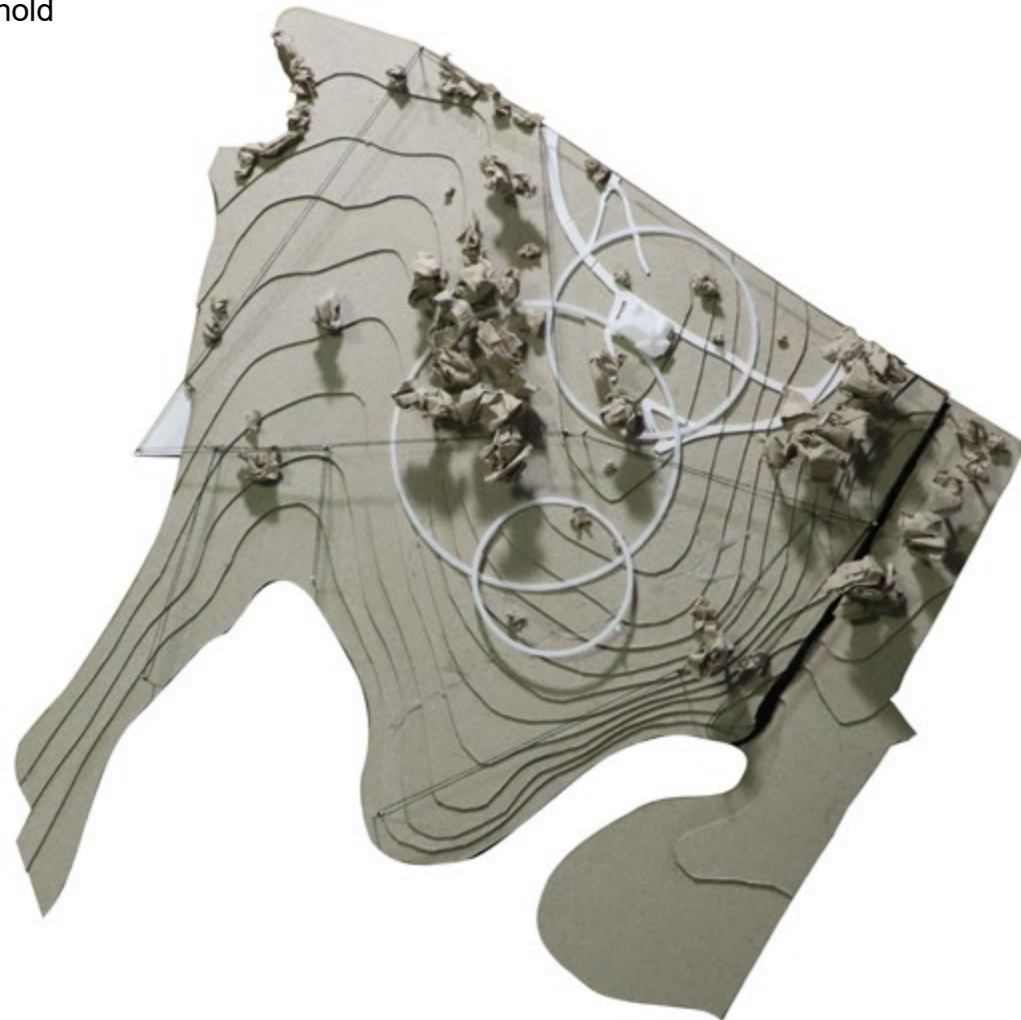
Dealing with the existing Cape Dutch revival architecture through adaptive reuse principles, this portion of the site will accommodate for its adaptive restoration and any intervention which may extend into a new structure

Deep healing

the most private aspect of program - minimal disturbance

Mobile

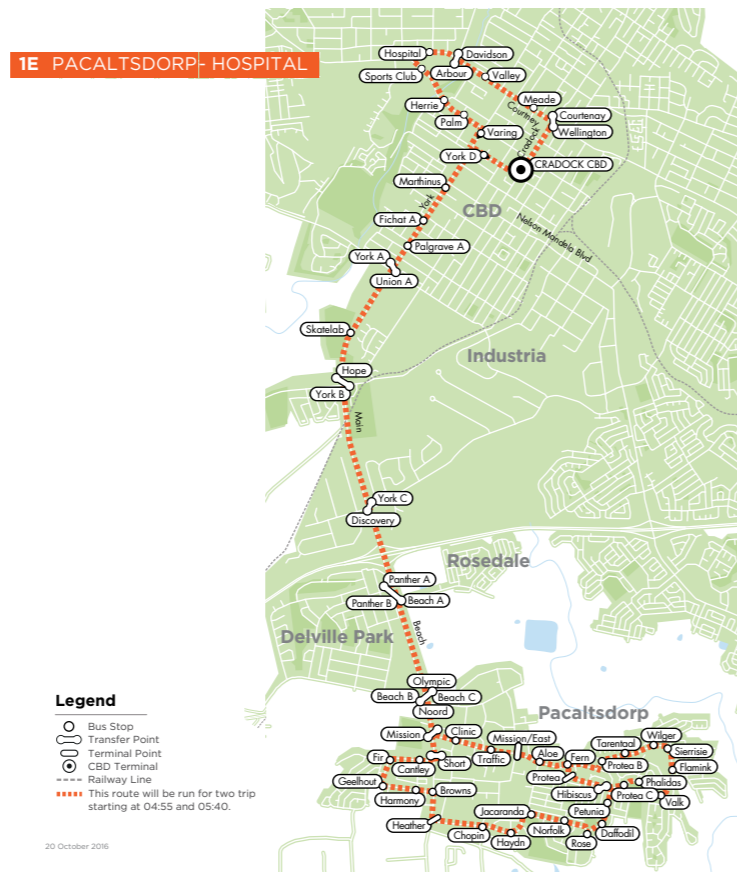
Movement more public, but pedestrian oriented natural threshold



GoGeorge Bus routes

The Go George Bus transports members of the various communities of George from most suburbs via specified routes at fixed times much like a localized version of Cape Town's MyCiti bus.

At the Northern entry to the site, in both Davidson and Arbour Road respectively are 2 GoGeorge bus stops. These stops allow for 3 direct bus routes from different parts of George, while being a short distance from the largest interchange, making the site very accessible via public transport.

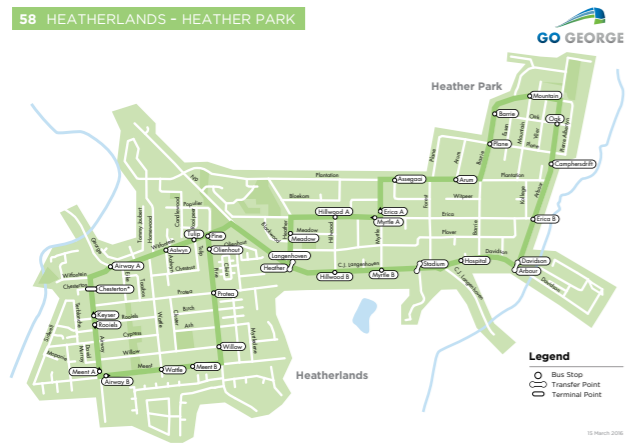


Legend

- Bus Stop
- Transfer Point
- Terminal Point
- CBD Terminal
- Railway Line
- This route will be run for two trip starting at 04:55 and 05:40.

20 October 2016

58 HEATHERLANDS - HEATHER PARK

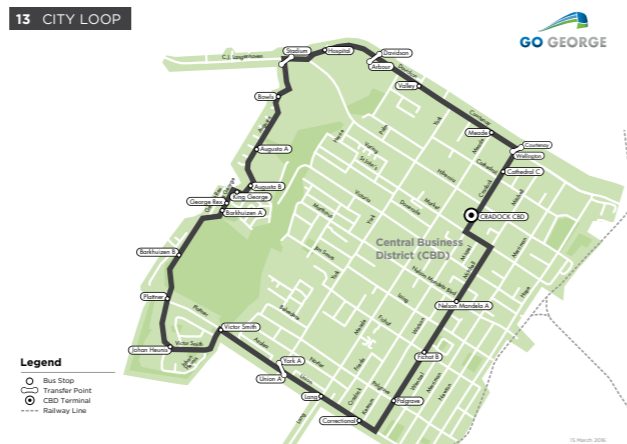


Legend

- Bus Stop
- Transfer Point
- Terminal Point

15 March 2016

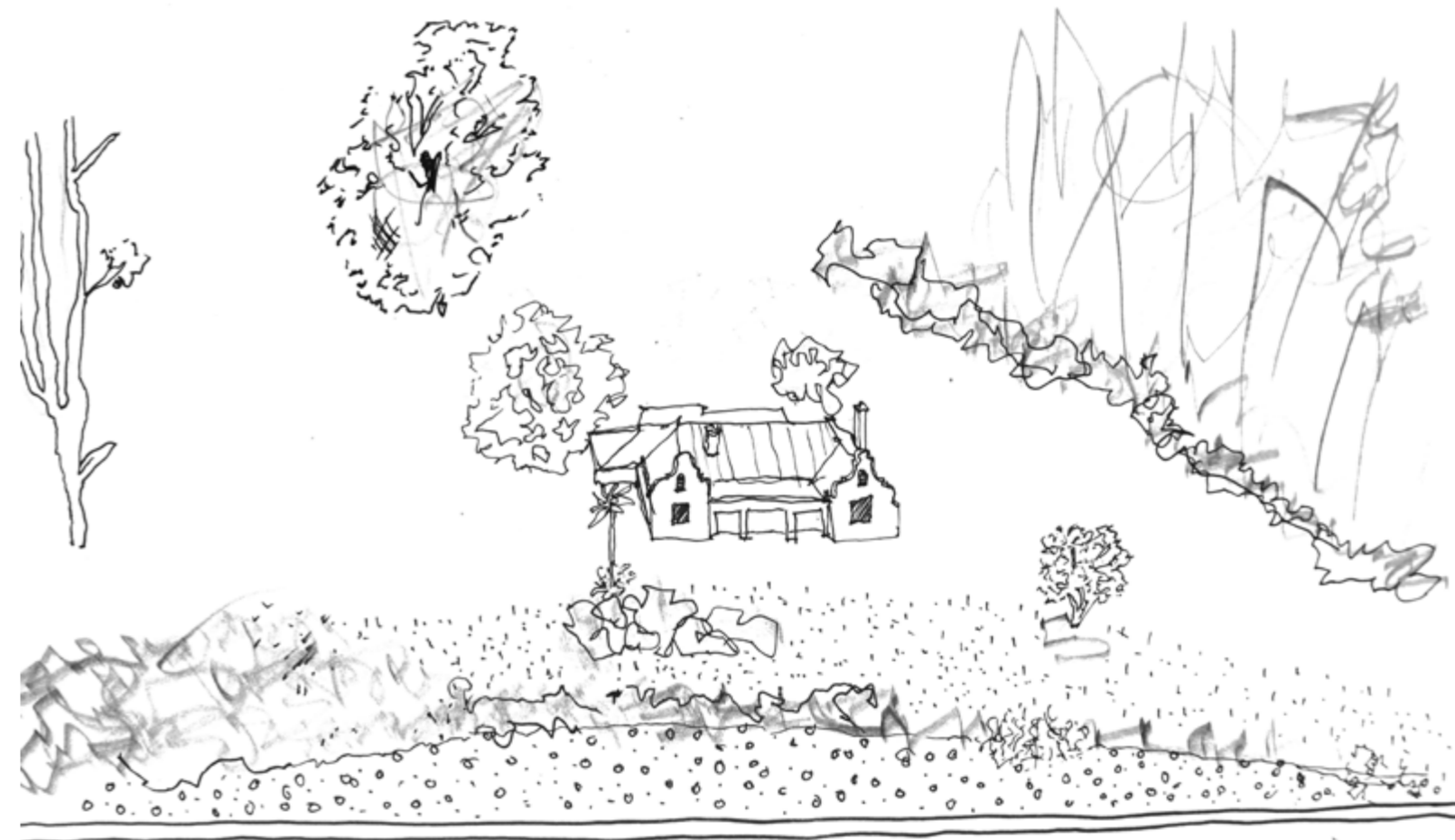
13 CITY LOOP



Legend

- Bus Stop
- Transfer Point
- CBD Terminal
- Railway Line

15 March 2016



DESIGN DEVELOPEMENT

By restoring and adapting the existing residency and recognizing its Material value – The design intends to take a space that was once exclusive, and separated from the surrounding communities, and to give it back to the people of George.

Utilizing the natural value of the site to its full potential, the design should carefully consider the existing trees, plants, topography, and natural features to create a space of healing and restoration, whereby members of the community can experience peaceful spaces and programs that benefit their health, both physically and mentally.

In the adaptation of the existing structures, as well as the addition of new structures, biophilic design principles are to be incorporated along with evidence-based healing interventions to create spaces that bring one closer with nature.

Programmatic Response

Programmatic Response

When considering the programmatic response to the site, my choices of function for my design intervention had to serve 2 primary functions.

Firstly, the programme had to include functions which positively impact the physical and mental wellbeing of the community members who visit. Secondly, the programme had to maximise the use of the existing natural landscape, while incorporating natural elements to inform the design both directly and indirectly.

In setting these guidelines, the design of a Wellness Precinct transpired, which would include a:

1. **Community Park Library** (containing physical and digital resources)
2. **Café** (Serving healthy foods prepared using local produce)
3. **Low-Impact fitness Studio** (For activities such as Yoga and Pilates)
4. **Changerooms & Bike Storage** (For those who cycle to the wellness precinct, or use the fitness facilities)
5. **Creative Arts Studio** (Where art classes in drawing, painting, pottery, or digital arts could be given to members of the community, in scenic surroundings)
6. **Co-Working Space** (Where members of the community who work remotely can rent a shared working space, surrounded by nature)

Forest as a spatial typology



Solitary Tree as a Landmark

As forests consist of several individual trees, a solitary tree, that is unique or different enough to stand out from the rest, can serve as a landmark in the landscape.



Two points suggesting a linear axis.

Where there are two or more consecutive points, then a linear axis is created, indicating a path which journeys from a beginning point to a destination.



Points in the landscape

Like stars within a constellation, non-linear interconnections are also created between multiple points.



Tree-lined Avenue

Serving as a threshold, a tree-lined avenue slices through thick forest, and functions as a marker or pathway to a destination



Crowded core

As more trees cluster in the centre of a forest, density becomes evident creating darker, thicker landscapes.



Space as a framing tool

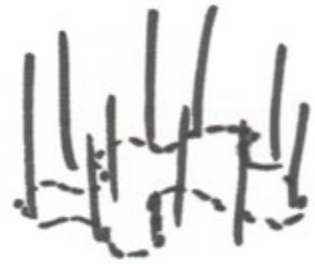
Spaces between trees create framed views into the landscape





Enclosed Clearing

Within a forest clearing exists an unseen void, much like an interior courtyard. Here the surrounding environment becomes muted by the pronounced contrast between ground and sky.



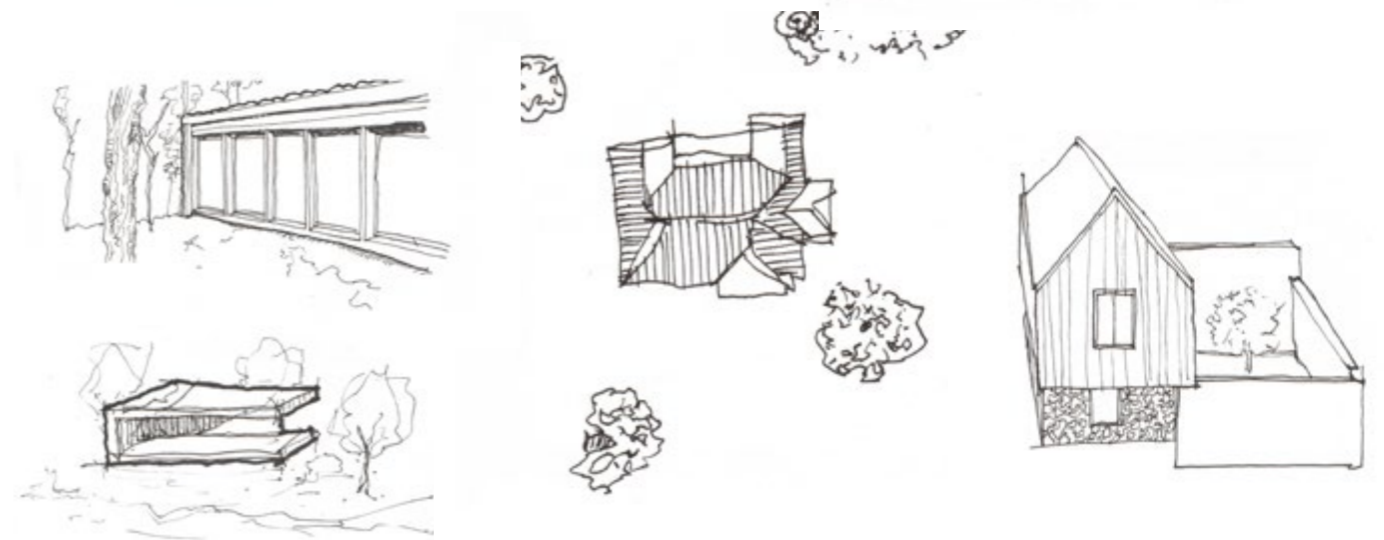
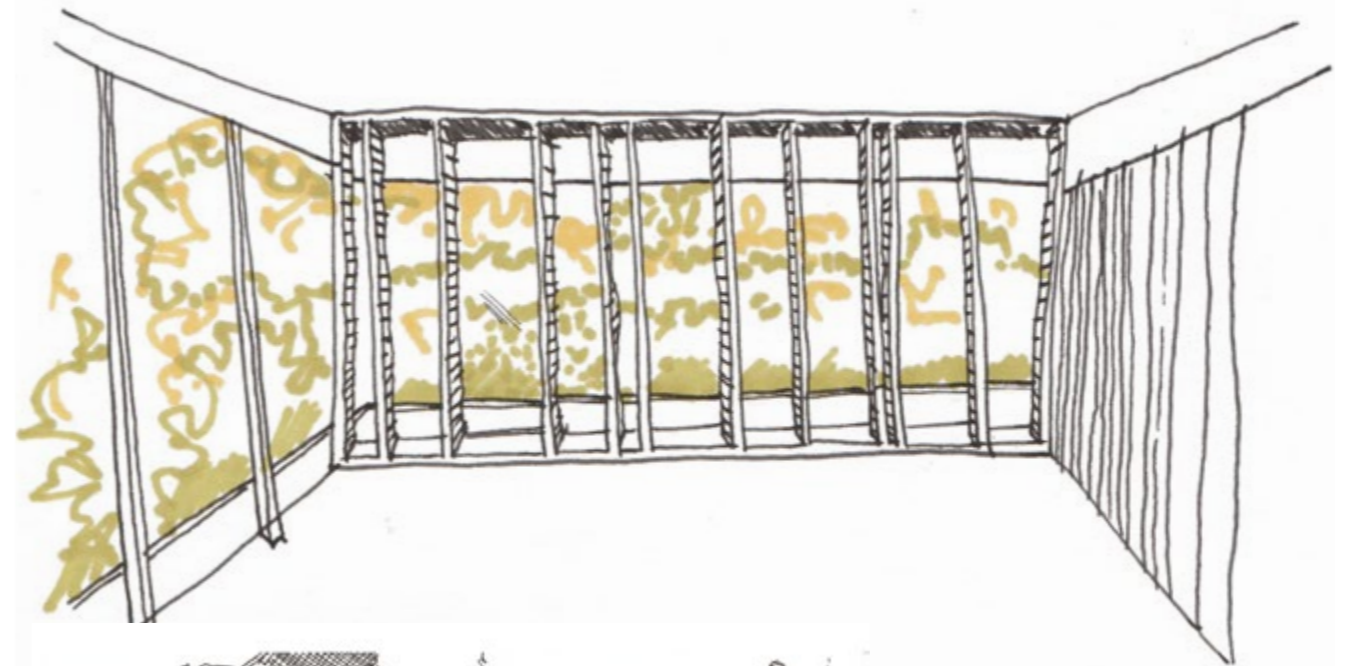
Loosely Defined Space

As spaces are loosely defined within a forest, navigating through different spaces requires a degree of spatial intelligence. Clustered trees resemble barriers, while more spacious clearings resemble useable space.



Meandering

Meandering through the forest landscape encourages constant adaptation to the ever-undefined pathway, distinguished only by the consistent spacing between its markers. This results in an explorative journey through the varying spaces.

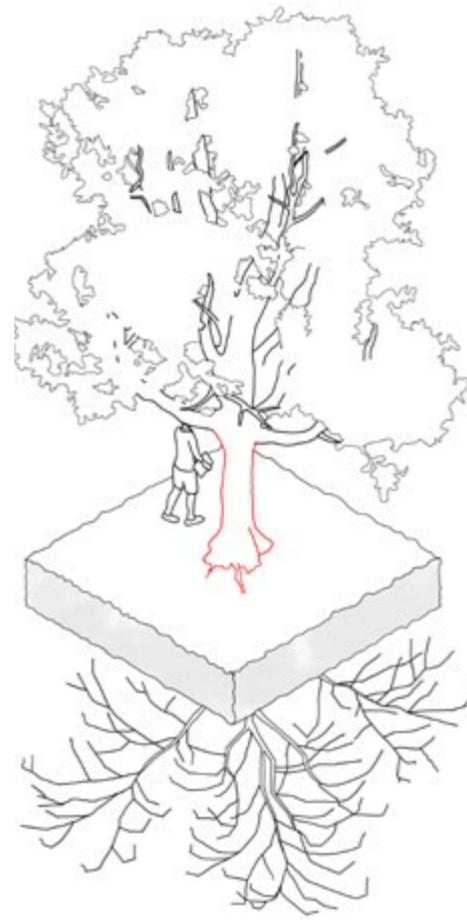


Trees as architectural elements



Roots

Just like the roots of a tree are grounded firmly in soil, providing stability and support to a tree, the foundations of a building too serve a similar purpose.



Trunk

Much like the trunk of a tree supports its branches and leaves, the primary structure of a building too provides the core support for load bearing elements.



Branches

Just as branches are an extension of a tree, they too can be likened to structural elements of a building that branch out from the main structure, providing functionality or additional space.



Leaves

Varying in shape and size, leaves capture and filter sunlight, which impact the overall experience of a tree. Outer elements such as the façade, and the arrangement of windows or exterior features are comparable to leaves and can add functionality and beauty to the structure.

Biophilic Design Principles



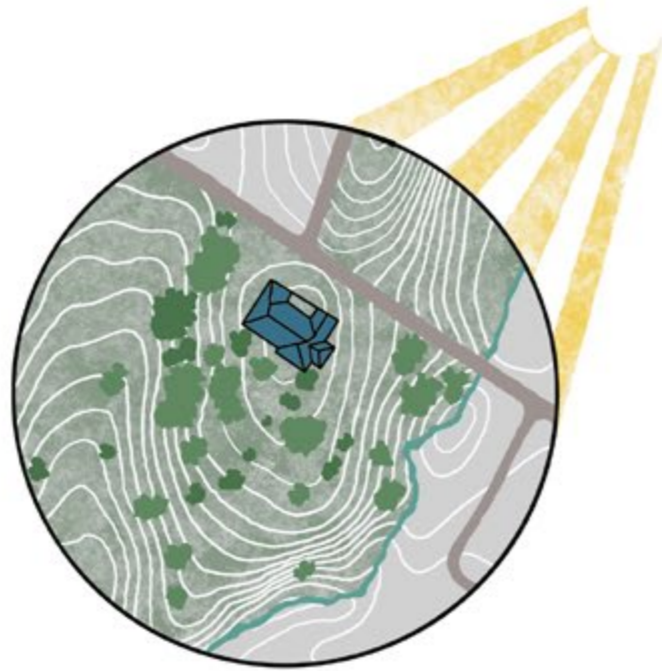
Natural Shapes and Forms



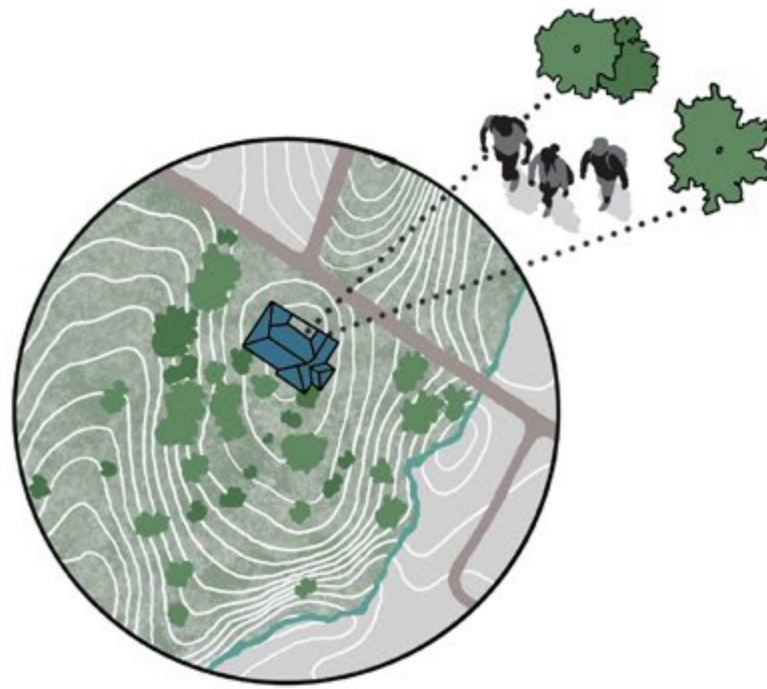
Place-Based Relationships



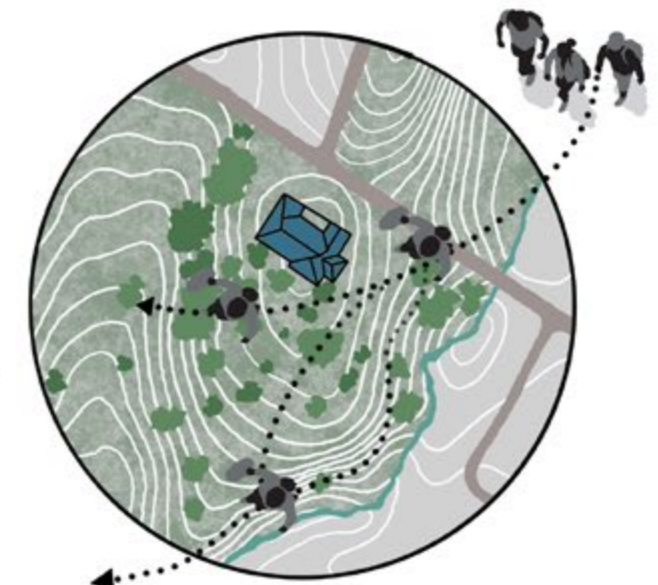
Environmental Features



Light and Space



Evolved Human-Nature Relationships



Natural Patterns and Processes

Material Pallette

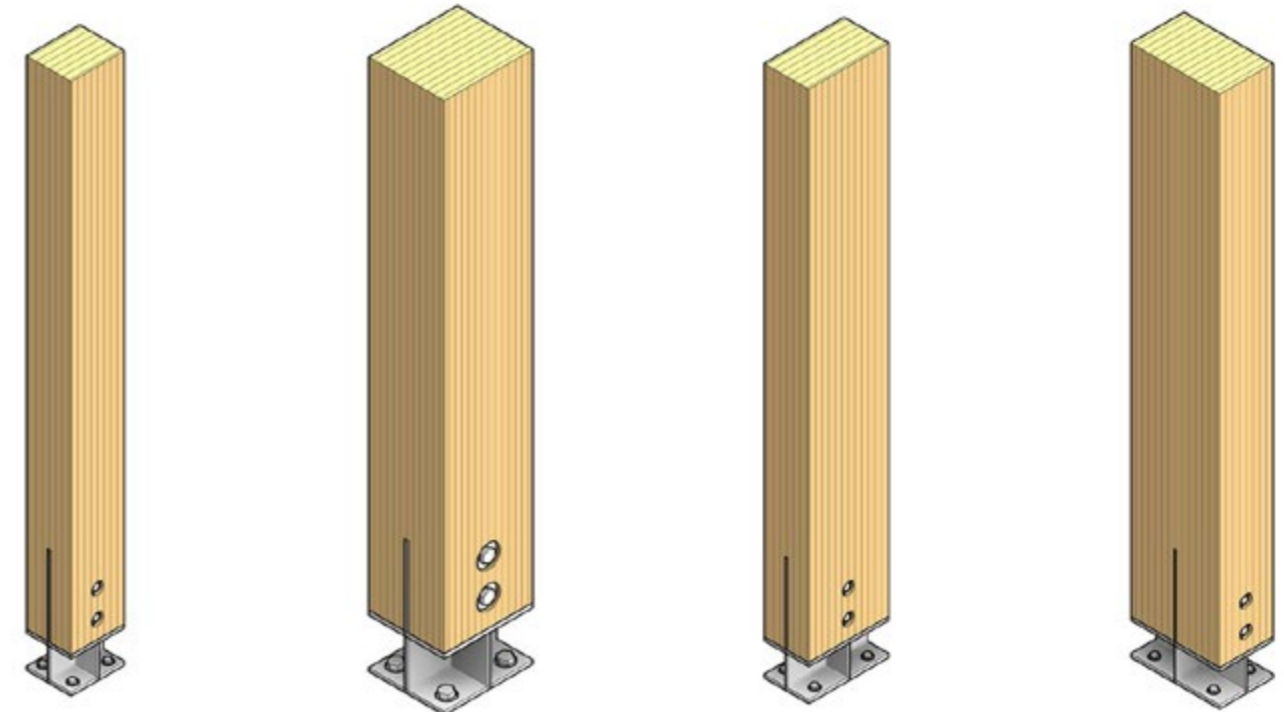
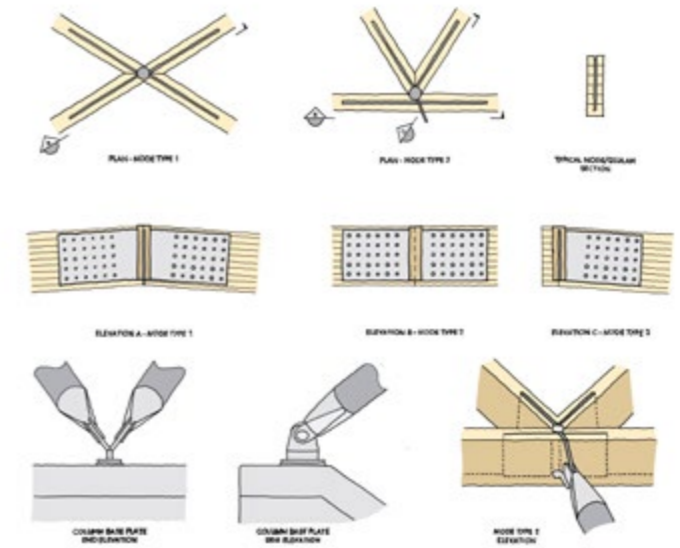
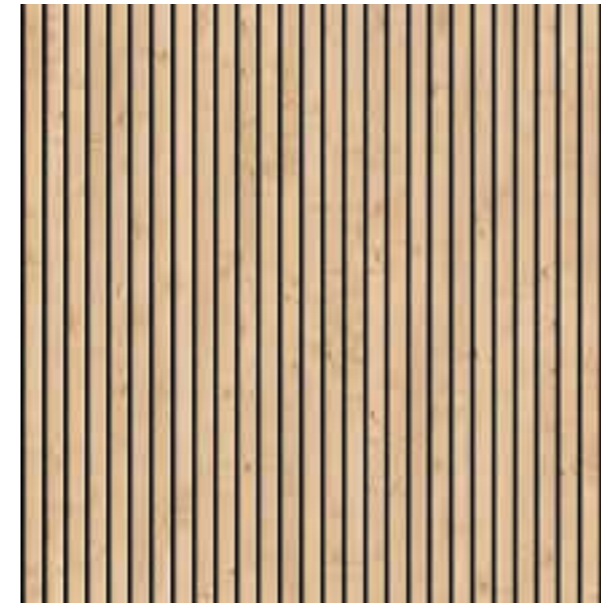
Existing



The Magistrate's residence as it stands, comprises of a concrete foundation with plastered masonry units forming the vertical structure and timber trusses forming the roof structure. Although partially damaged by a fire in March 2023, majority of the roof is still intact and is clad with shingles, while the 'stoep' is covered by corrugated zinc sheeting. As the structure has been neglected over the years, most of the original oak flooring and timber windowsills have been removed and used as firewood within the structure.

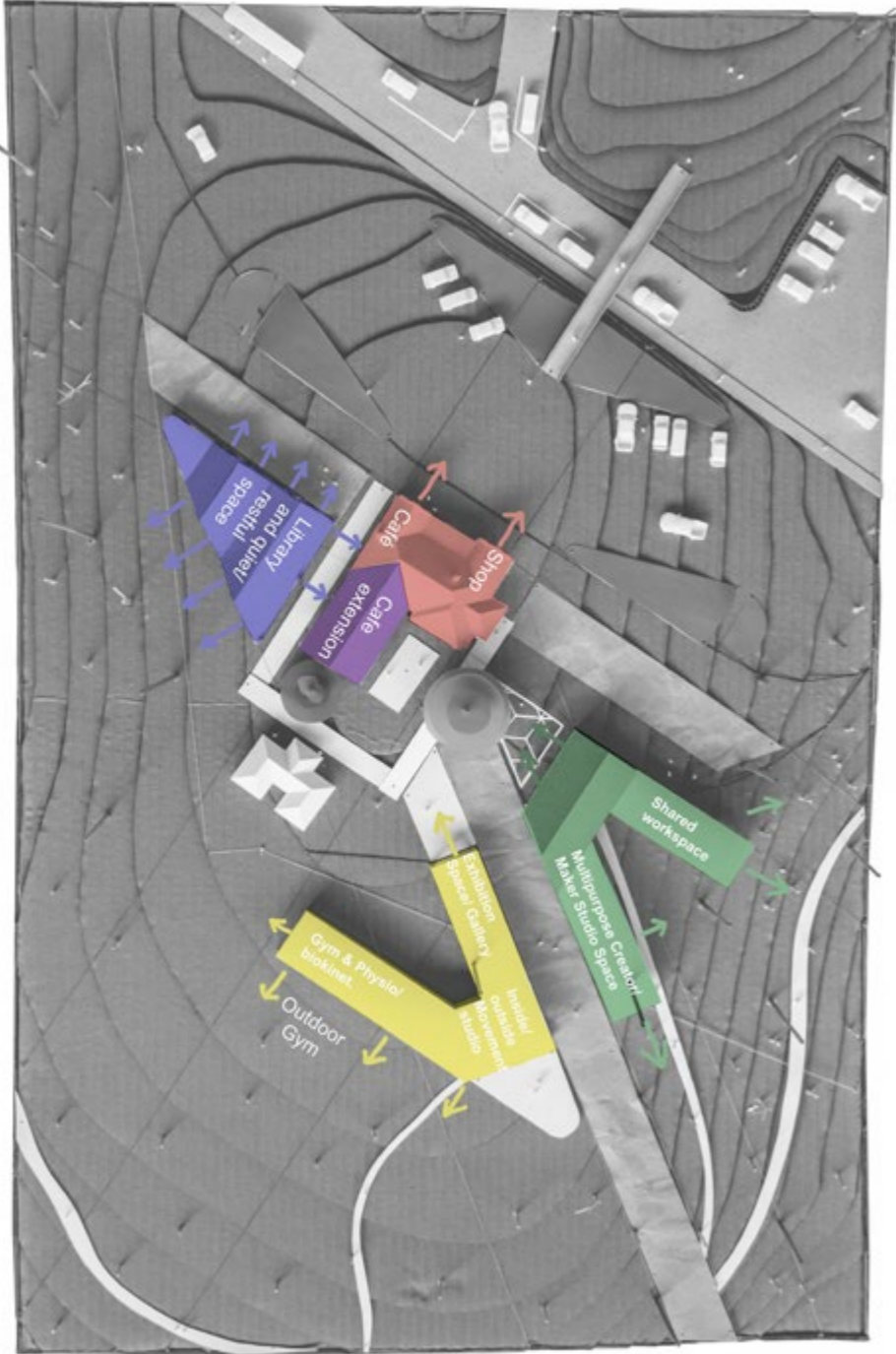
Material Pallette

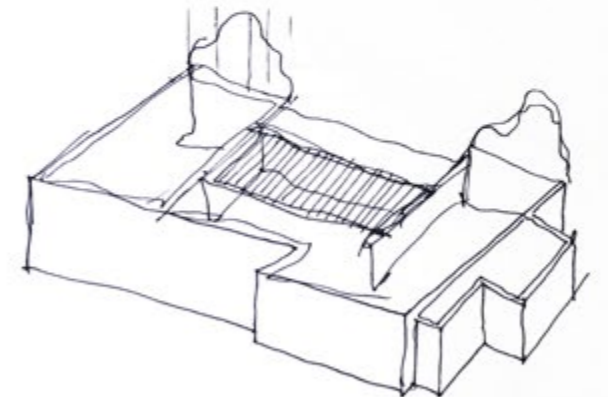
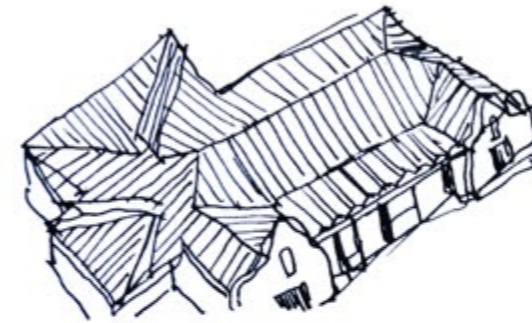
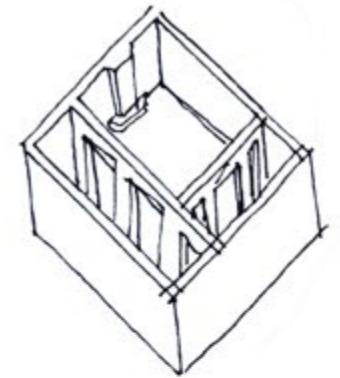
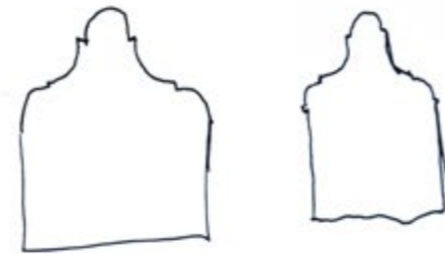
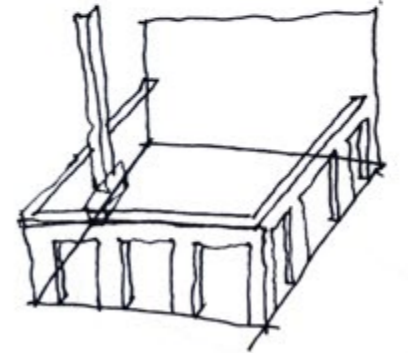
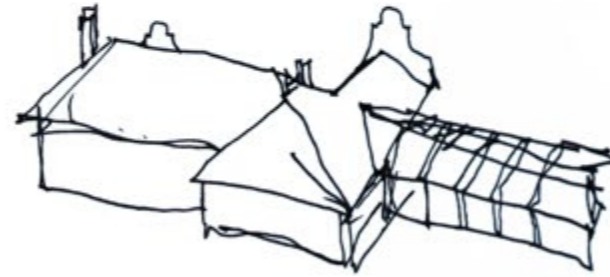
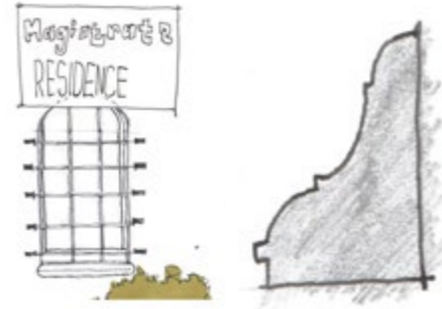
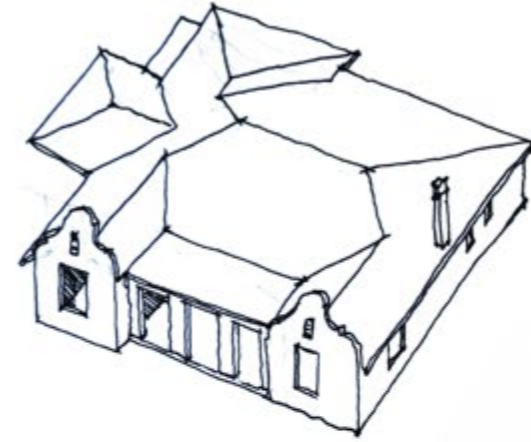
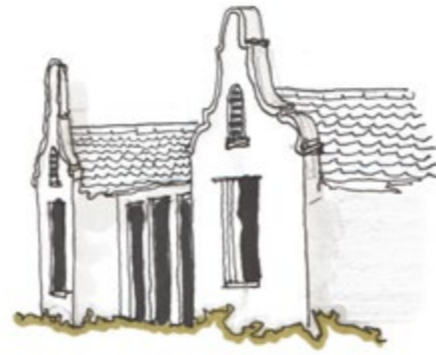
New

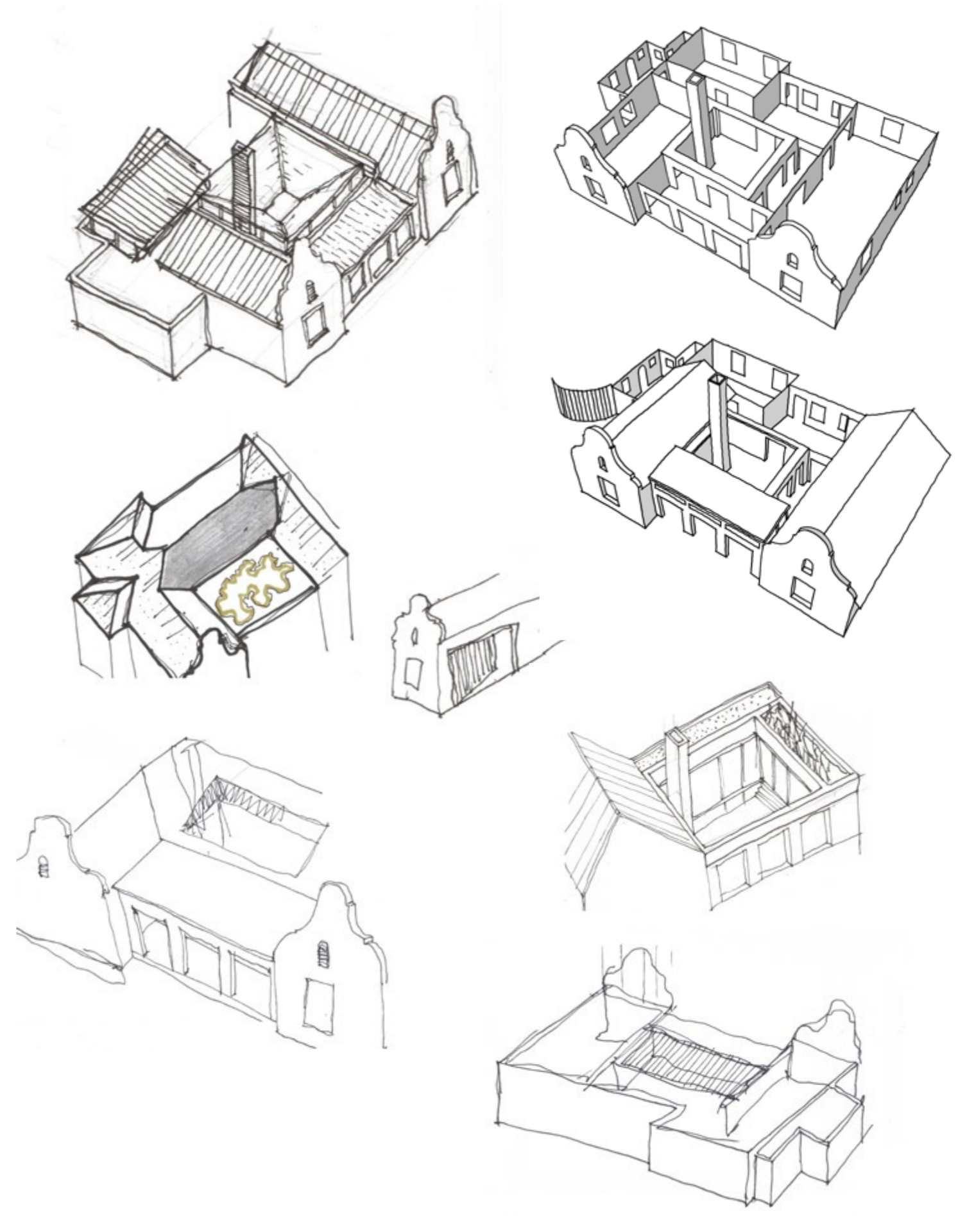
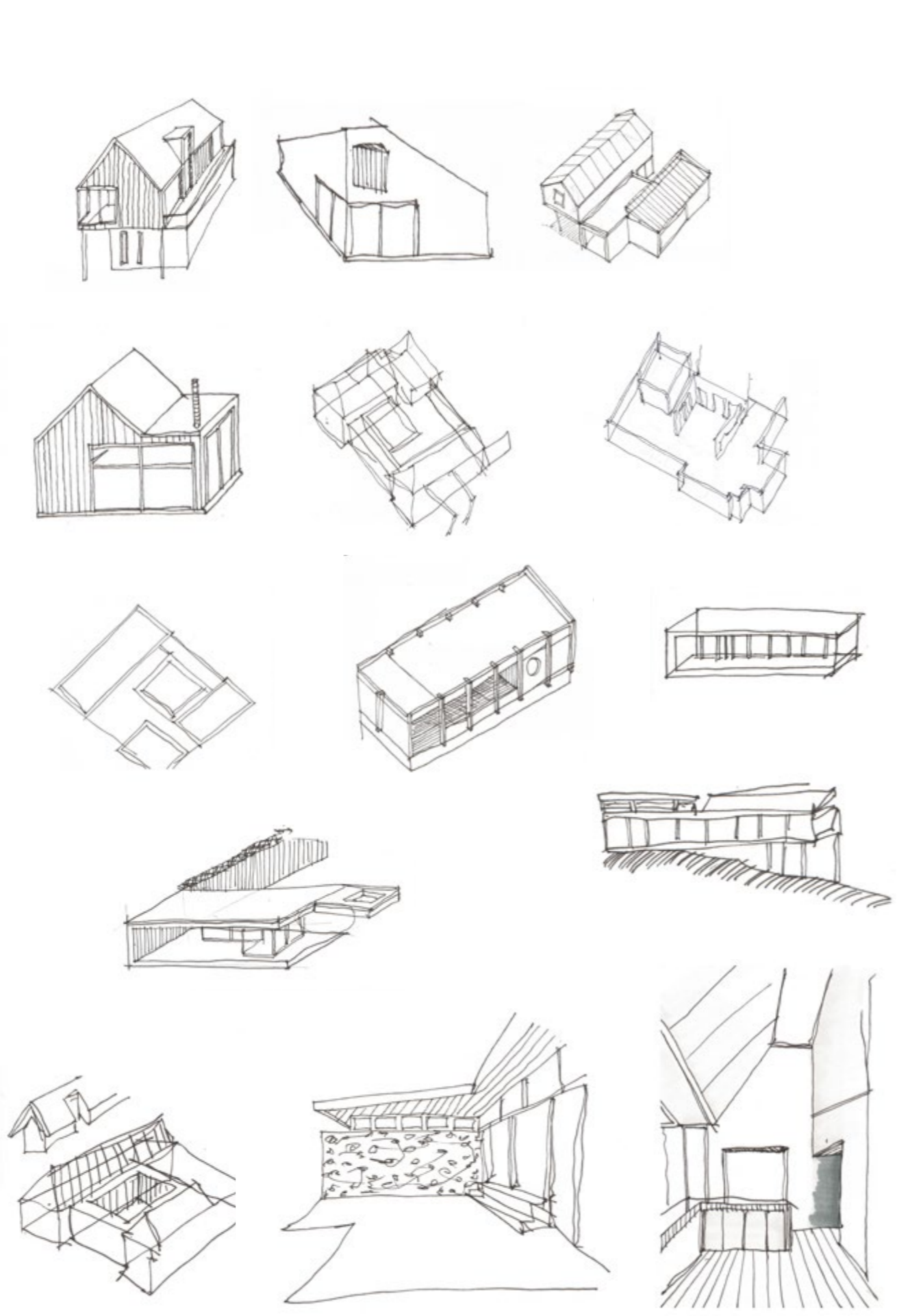


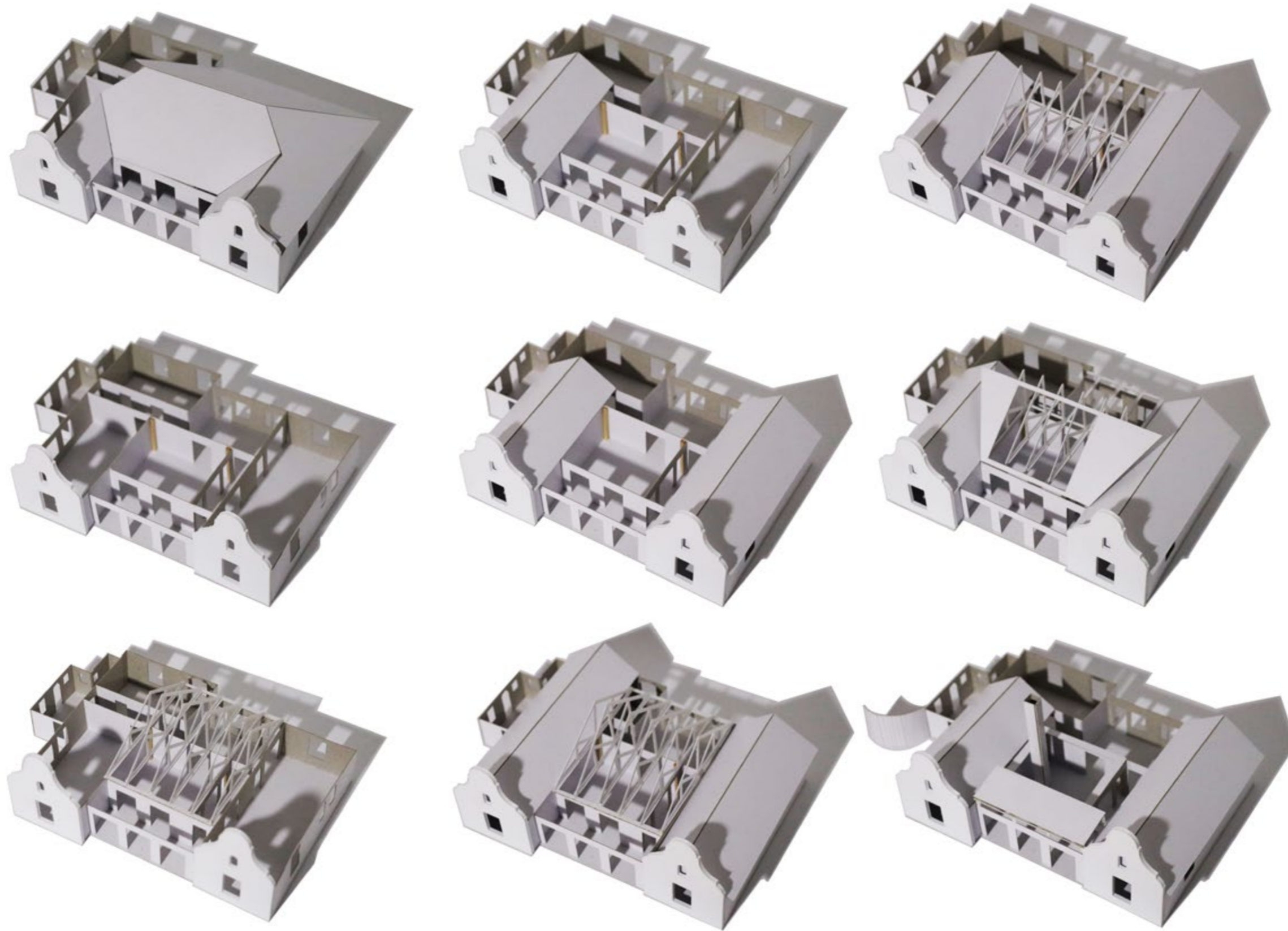
Thinking through Making

The first design iteration consisted of several massing on a contoured landscape. While the exercise was successful in the exploration of form making, understanding the topography and scale of the site and it's trees, the design ultimately evolved throughout the development process.







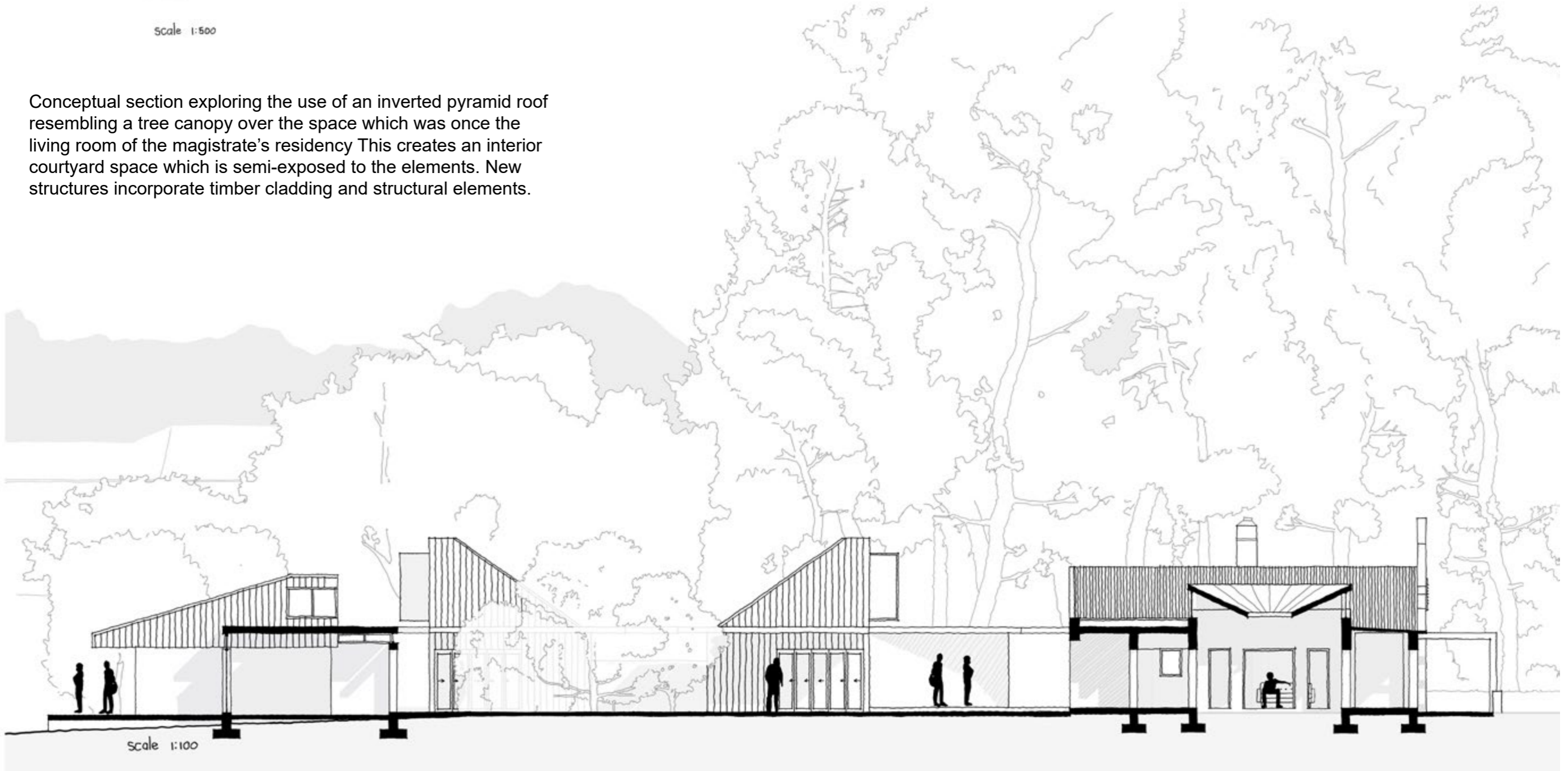


After the first design iteration, it surfaced that more focus should be put into understanding the existing structure before adapting it for a new function. In doing so, a model exploration was carried out to determine what elements of the floor plan and roof structure could be adjusted, and what variations of puncturing or extruding could be used to extenuate the form.



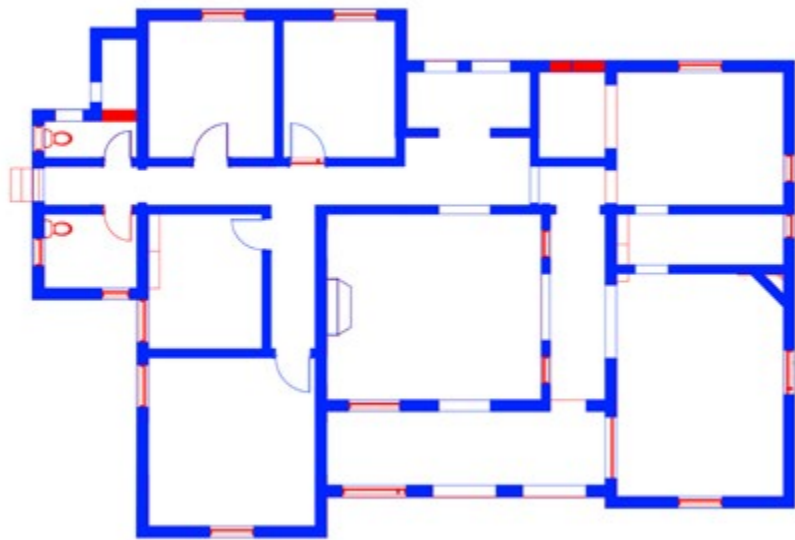
Scale 1:500

Conceptual section exploring the use of an inverted pyramid roof resembling a tree canopy over the space which was once the living room of the magistrate's residency. This creates an interior courtyard space which is semi-exposed to the elements. New structures incorporate timber cladding and structural elements.



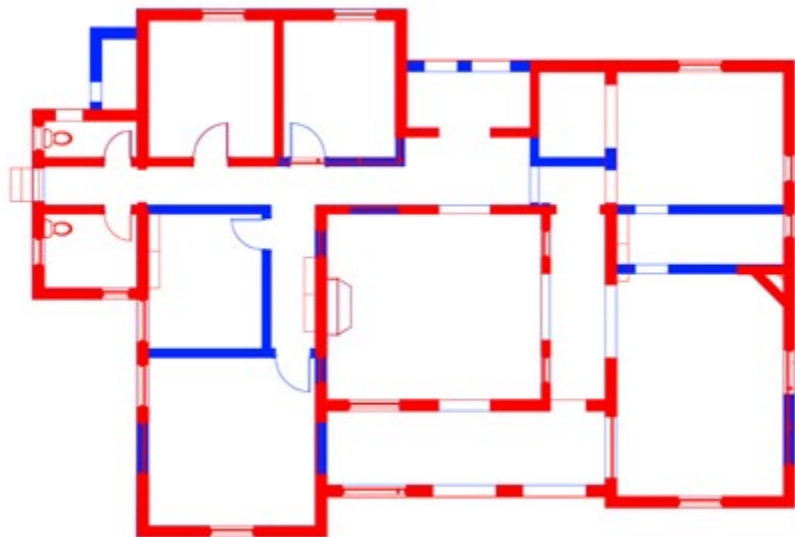
Scale 1:100

Plans before and after Adaptation



EXISTING

This Diagram shows where new walls were added to the structure(Indicated in red).

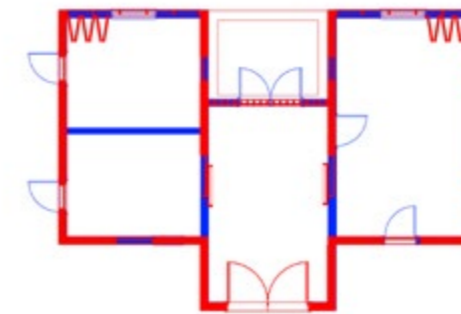


Post-Adaptation

This Diagram shows where existing walls were demolished (Indicated in Blue).

Magistrates Residency

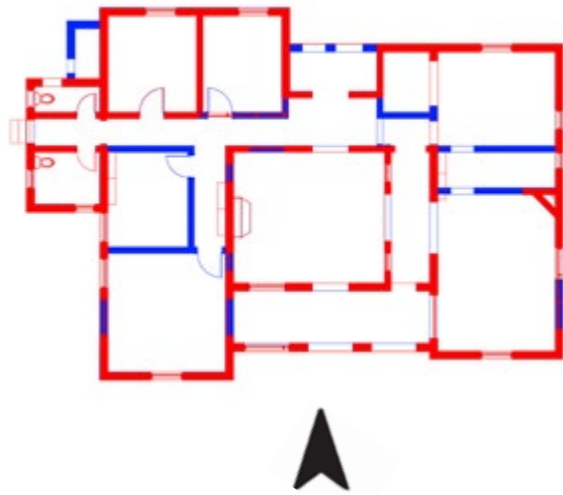
As both the residency and its cottage are to be adapted in the design proposal, it becomes necessary to clarify the difference between the new and existing.



Cottage

Pedestrian scaled perspective before and after Adaptation

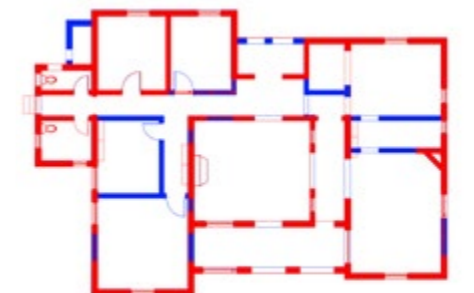
Using an overlaid map of the structure before and after its adaptation, an arrow indicates the direction in which the comparison is viewed from.



Before Adaptation



After Adaptation





Before Adaptation



After Adaptation

122

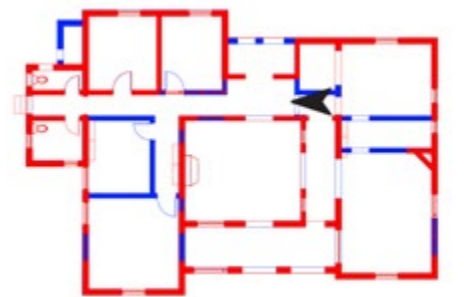


Before Adaptation



After Adaptation

123





Before Adaptation



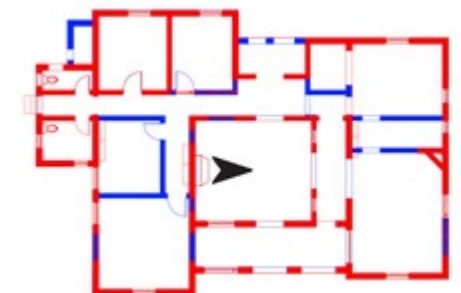
After Adaptation



Before Adaptation



After Adaptation





Before Adaptation



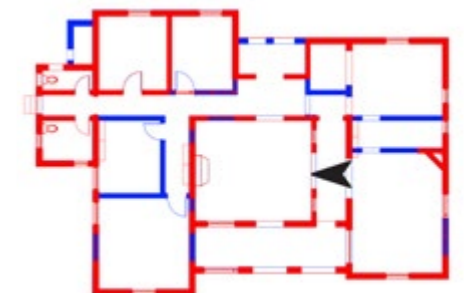
Before Adaptation



After Adaptation



After Adaptation





Before Adaptation



Before Adaptation

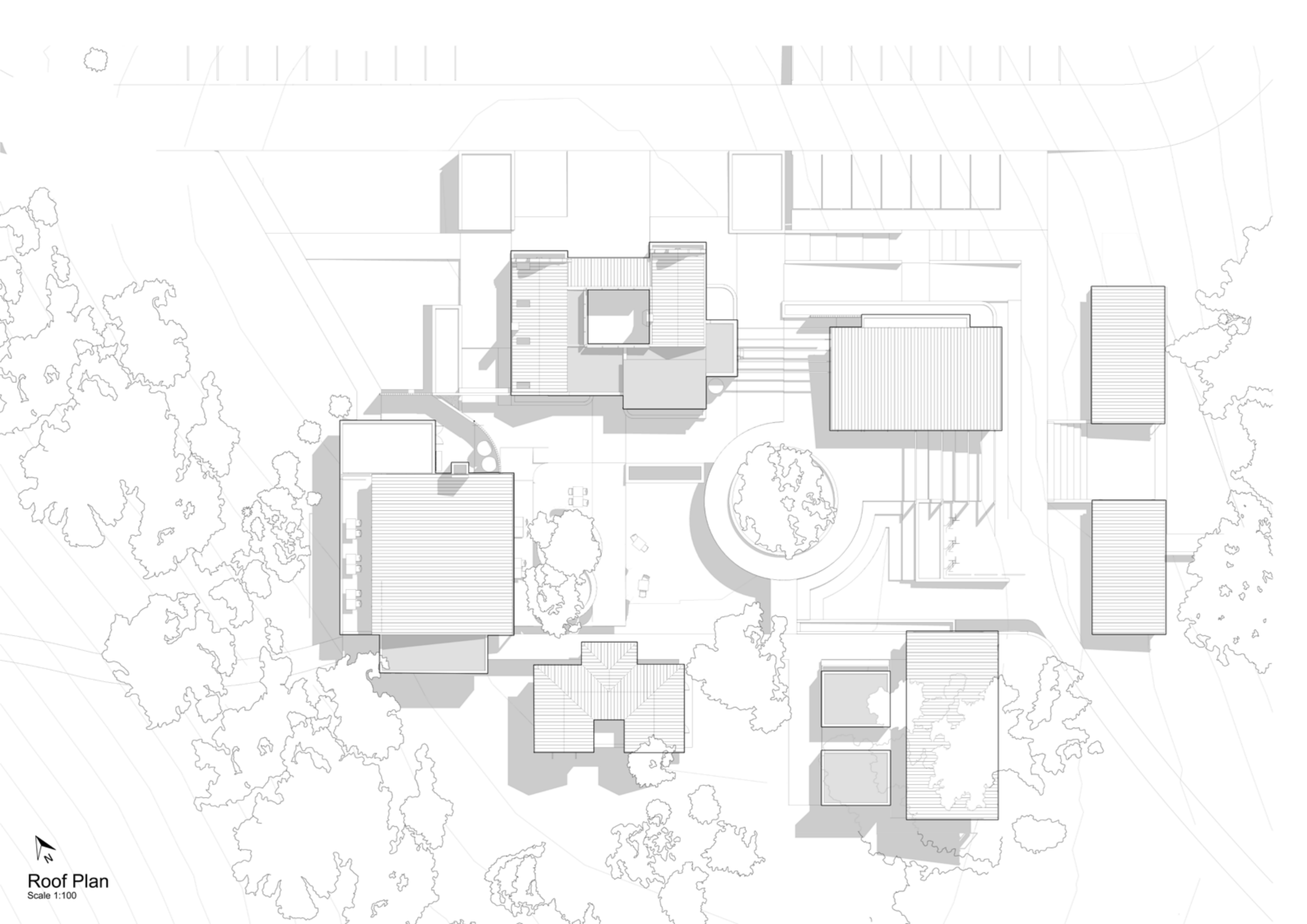


After Adaptation

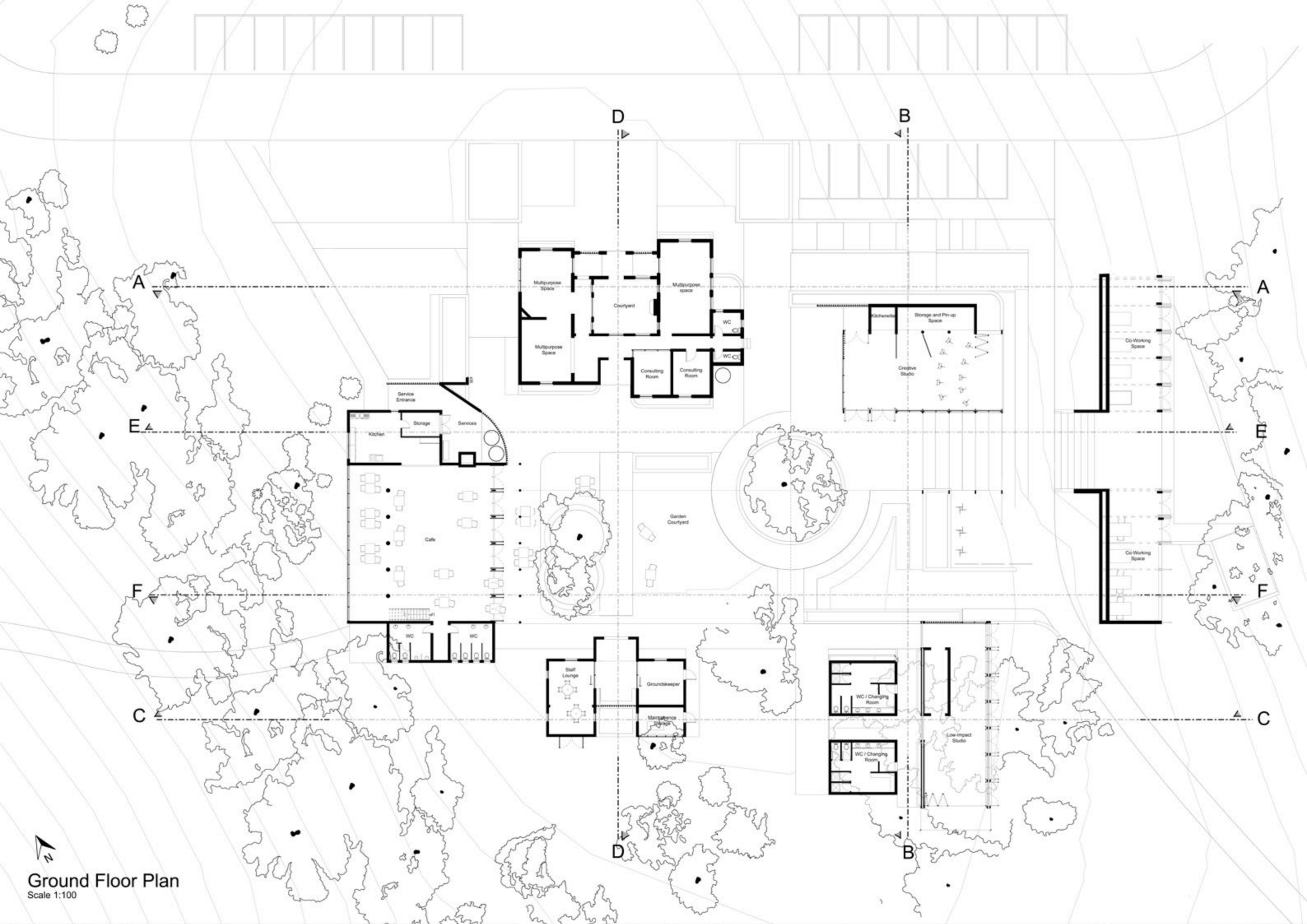


After Adaptation





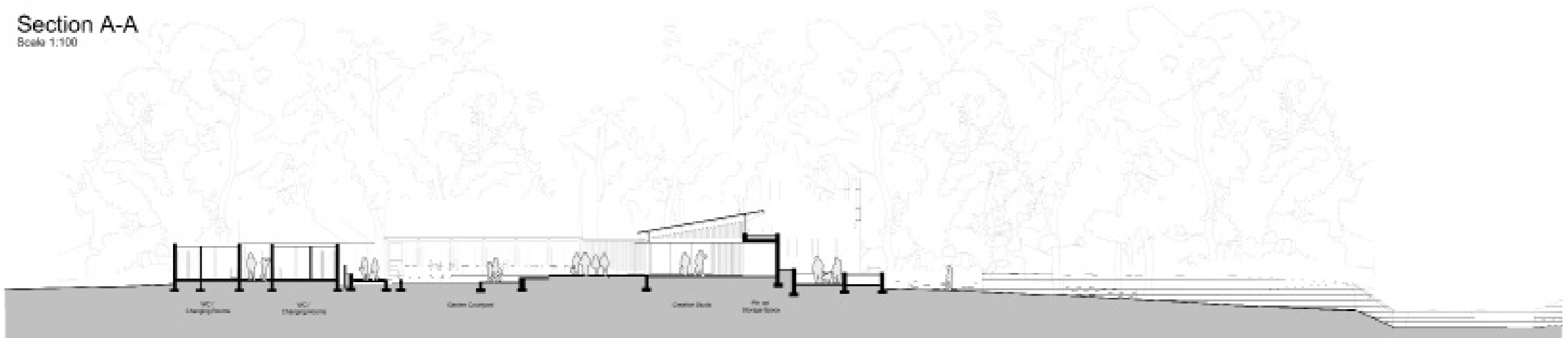

Roof Plan
Scale 1:100



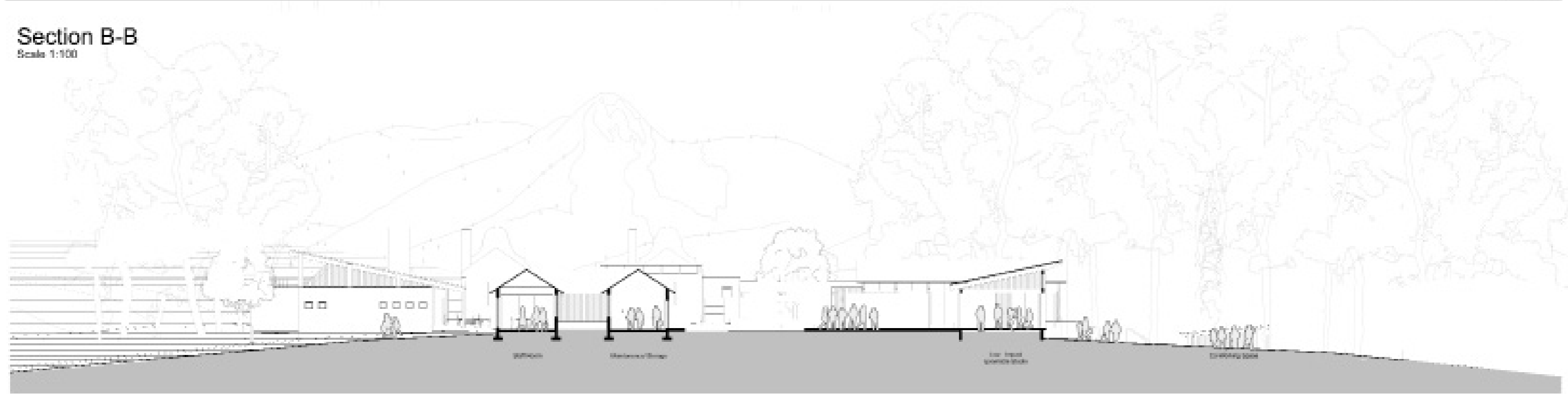
Ground Floor Plan
Scale 1:100



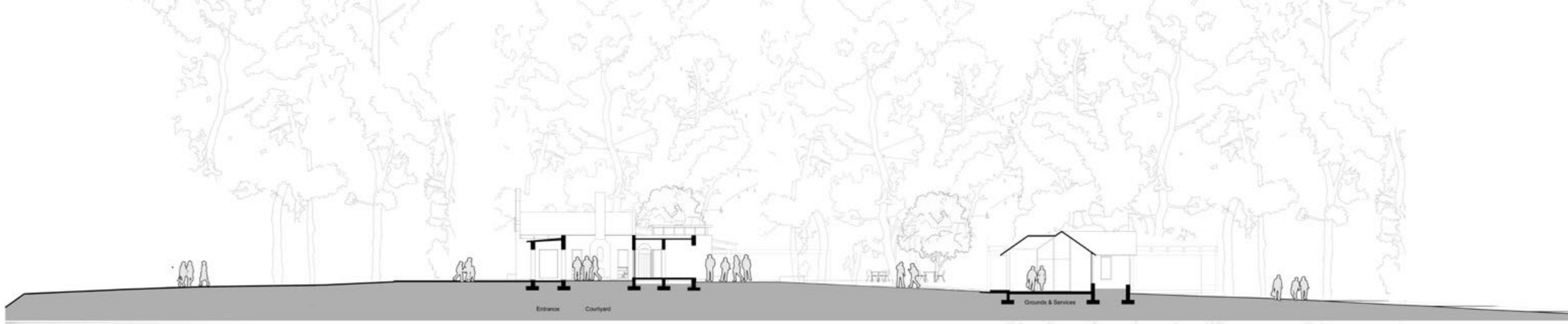
Section A-A
Scale 1:100



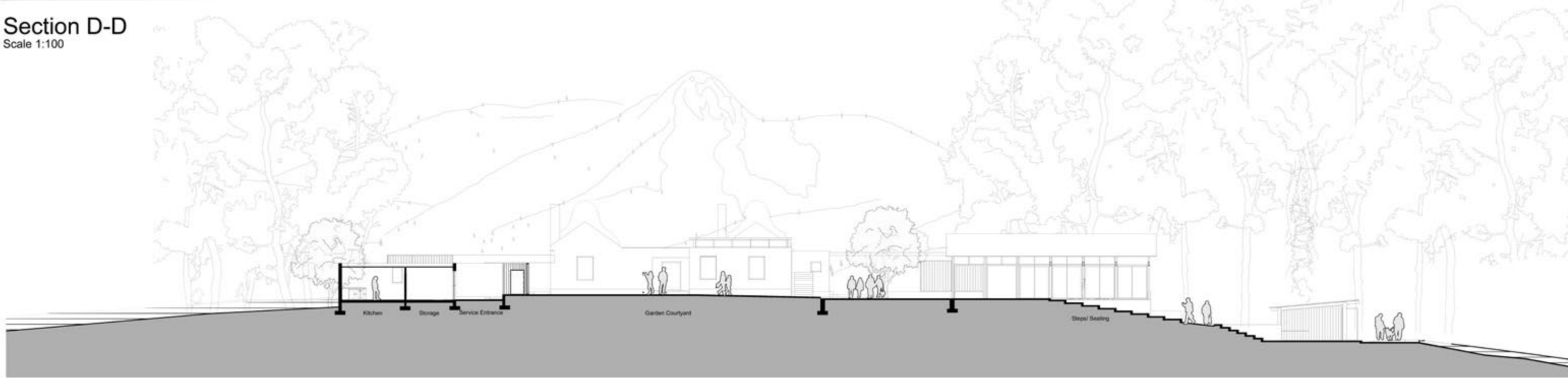
Section B-B
Scale 1:100



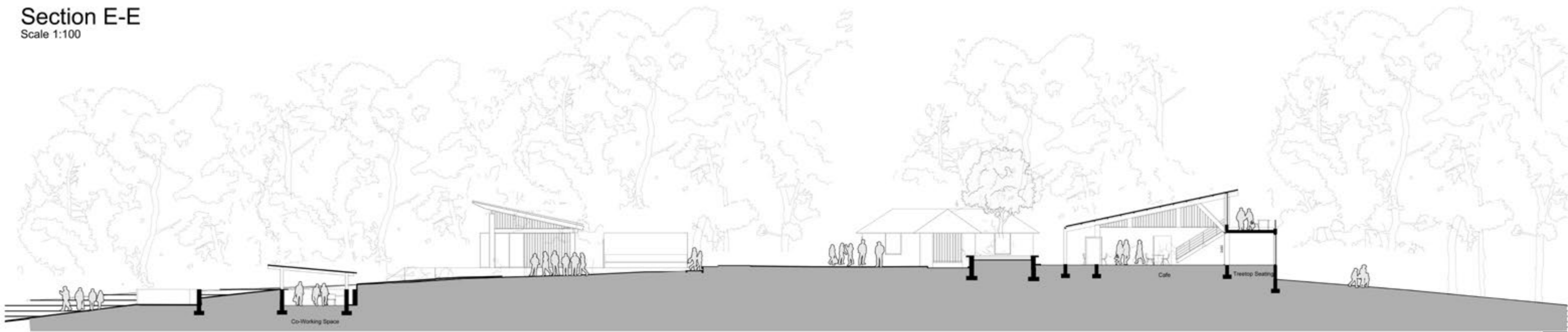
Section C-C
Scale 1:100



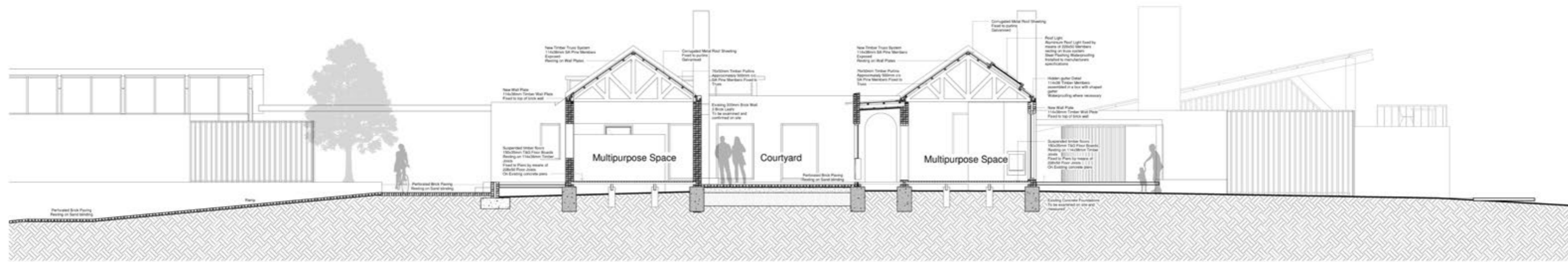
Section D-D
Scale 1:100



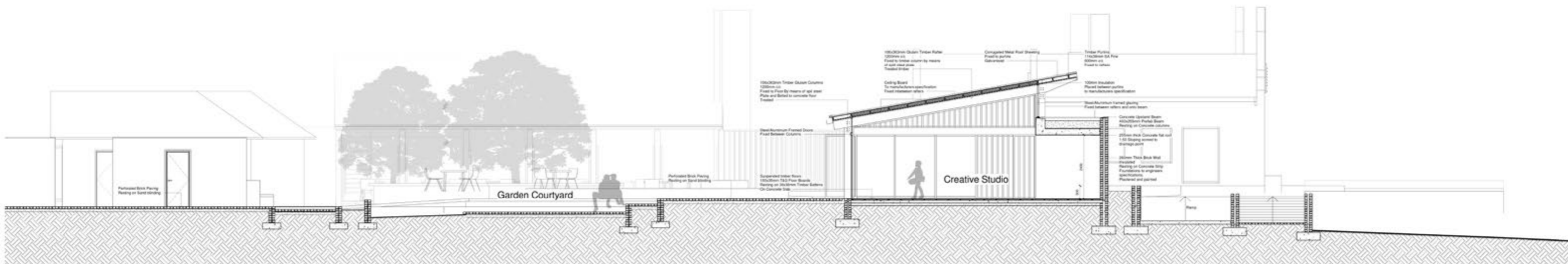
Section E-E
Scale 1:100



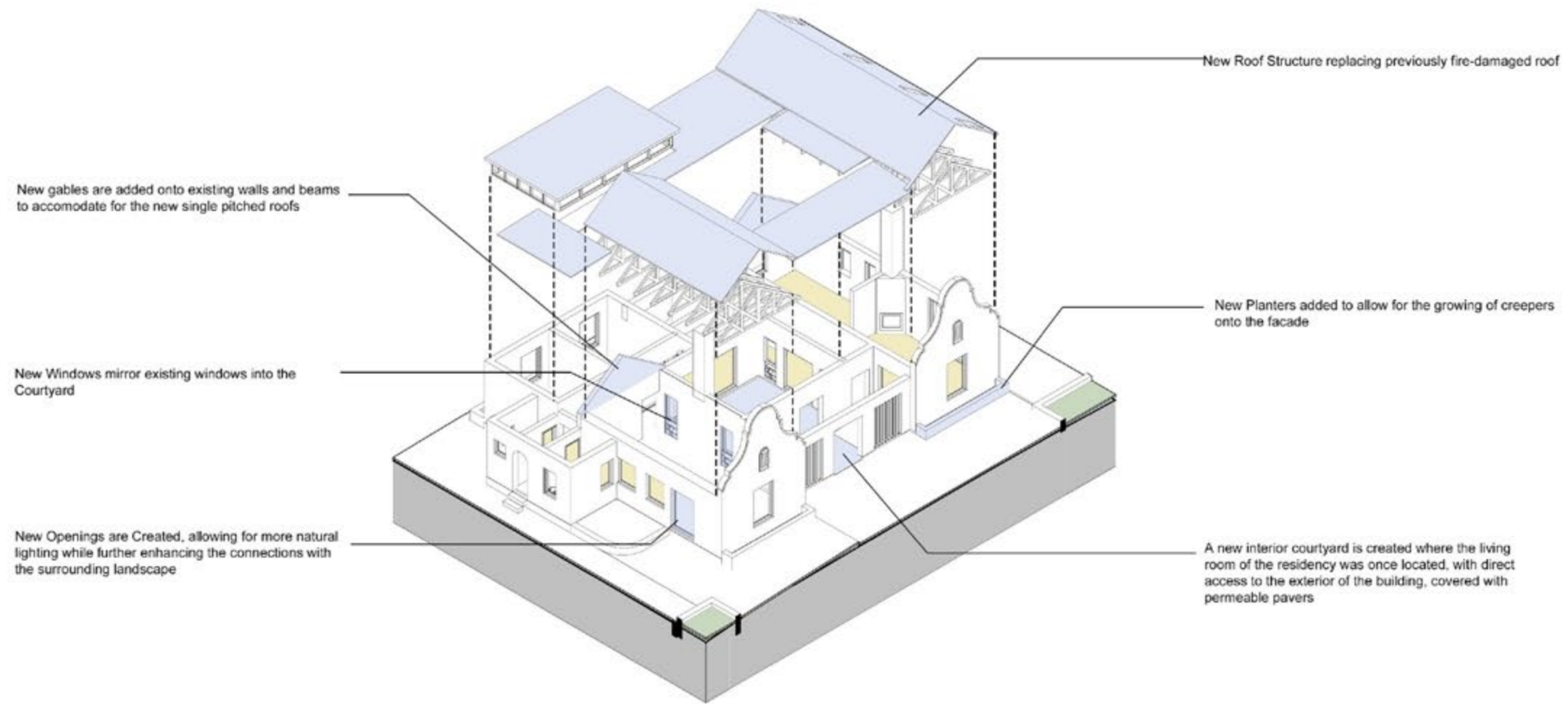
Section F-F
Scale 1:100



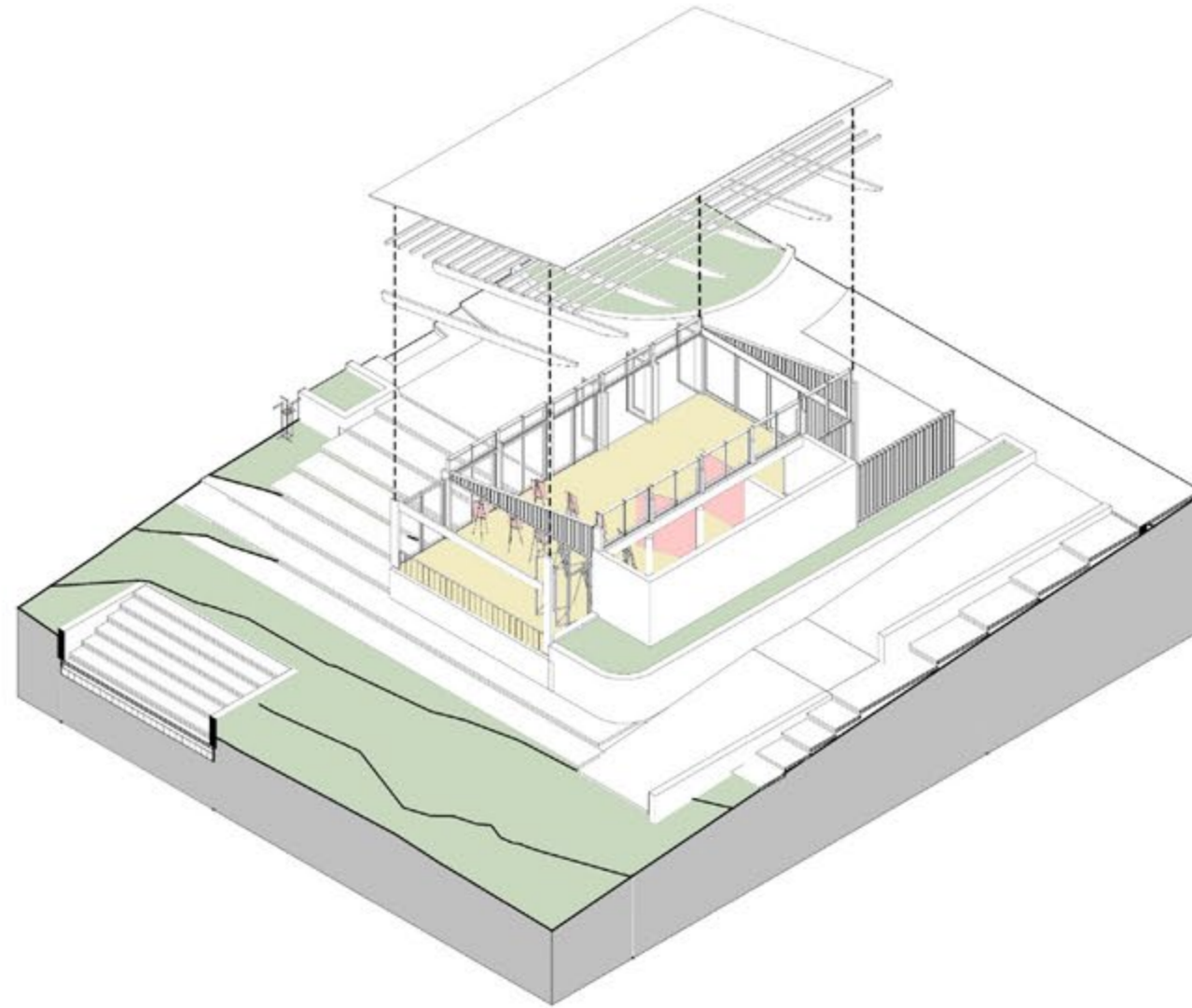
Technical Section A-A
Scale 1:50



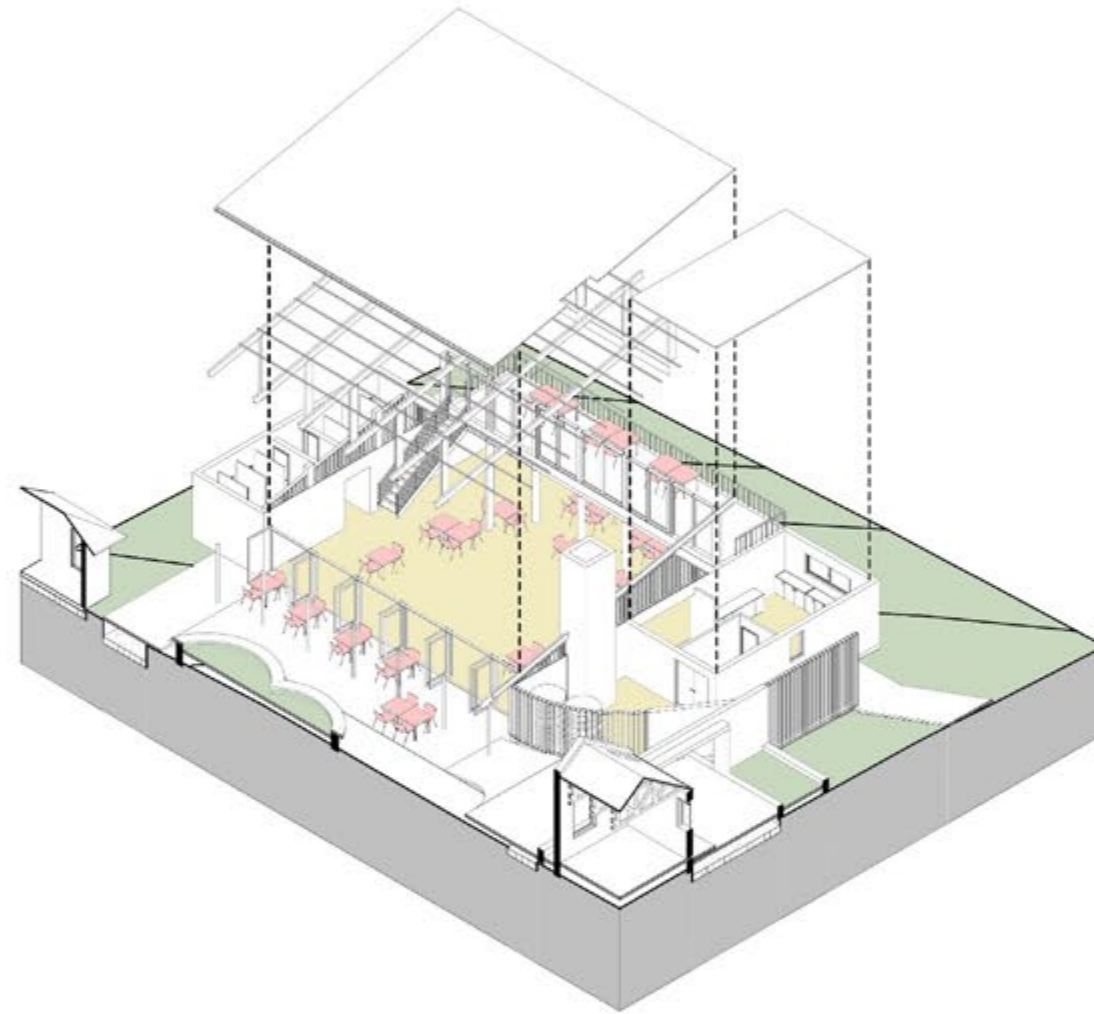
Technical Section B-B
Scale 1:50



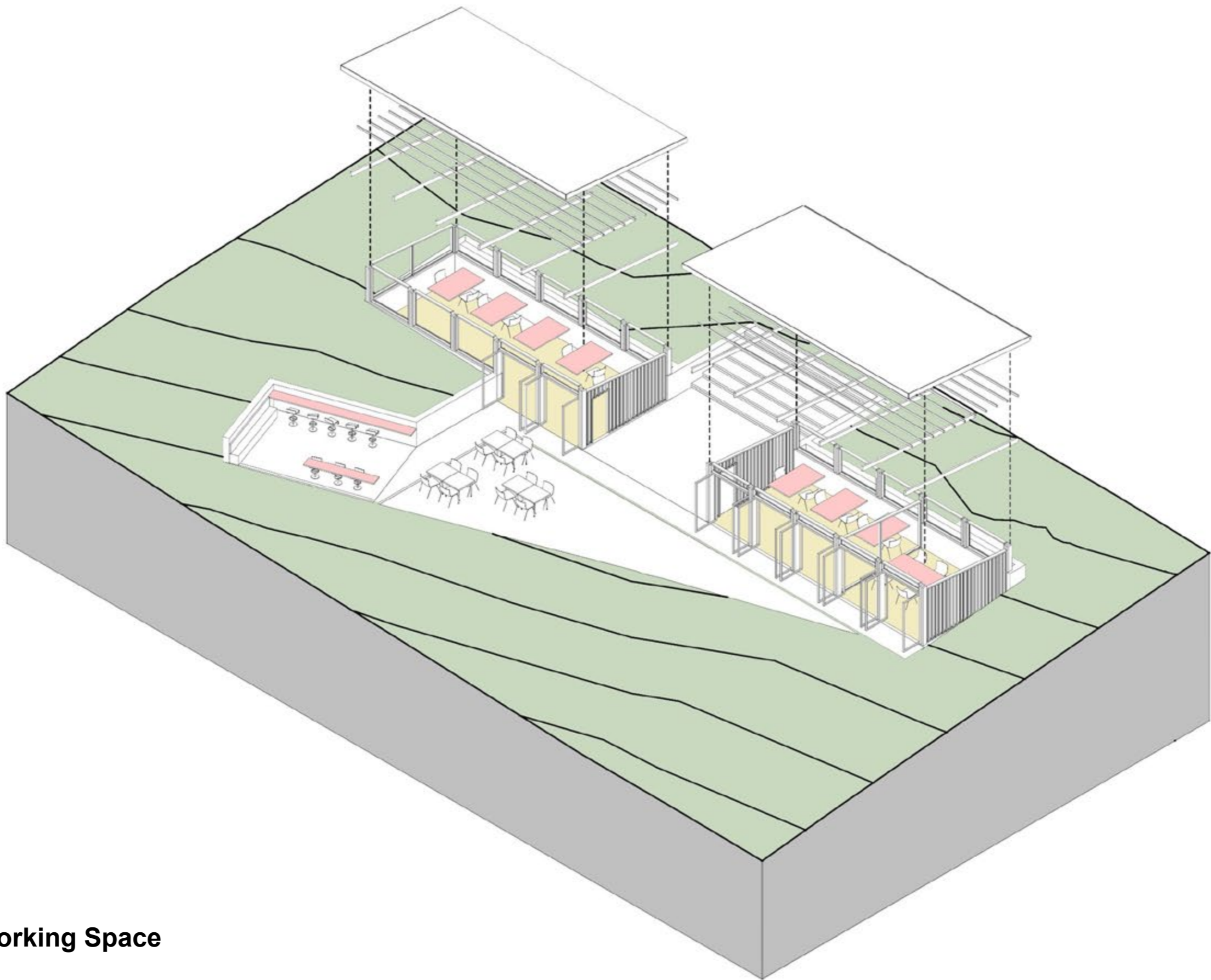
Multi-Purpose Wellness Centre



Creative Arts Studio



Garden Cafe



Co-Working Space





Conclusion

Through my research, it has become clear that there are several factors to consider when restoring a building with heritage importance. Adaptive reuse theory also revealed itself to be very dense, consisting of several overlapping theories and strategies that can often be applied interchangeably with each other, making it challenging at times to interpret an intervention when analysed from different perspectives.

However, when considering the selected site in George and the potential means with which to engage with it, I decided to incorporate a strategic approach of adaptive reuse to my restoration. A poetic architectural response to the neglected magistrate's residence would be accompanied by the implementation of additional structures, relating to the existing buildings and landscape.

With a better understanding of how healing occurs and how our different environments can impact restorative process, the research also aided in providing evidence-based design principles that could be applied to the final design. Biophilic design principles also provided useful lenses through which to understand the connections that people have with nature.

The design proposal gives the previously secluded historical structure back to the community, while enhancing connections between those who visit the wellness precinct and the surrounding landscape, providing programs that have a positive impact on physical and mental well-being while enhancing natural connections into everyday life.

PRE-SCREENING QUESTIONNAIRE OUTCOME LETTER

STU-EBE-2023-PSQ000670

2023/09/14

Dear Luke Moss,

Your Ethics pre-screening questionnaire (PSQ) has been evaluated by your departmental ethics representative. Based on the information supplied in your PSQ, it has been determined that you do not need to make a full ethics application for the research project in question.

You may proceed with your research project titled:

Healing Through Restoration
The adaptation of Cape Dutch Revival Architecture in George into a place for healing

Please note that should aspect(s) of your current project change, you should submit a new PSQ in order to determine whether the changed aspects increase the ethical risks of your project. It may be the case that project changes could require a full ethics application and review process.

Regards,

Faculty Research Ethics Committee

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