

Le Guérisseur

French Translation "The Healer"

Investigating the Therapeutic Qualities of Water as a Catalyst for healing in an Urban Oncology Wellness Treatment Centre.



La guérison n'est pas seulement la disparition totale des symptômes d'une maladie ou des conséquences d'une blessure avec retour à l'état de santé antérieur mais elle est surtout définie comme l'acte de reconstruire un tout ou une âme, elle fait référence à l'équilibre et au contentement de l'état mental, spirituel et physique, une approche holistique centrée sur l'homme.

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French Translation : "The Healer"

Investigating Therapeutic Qualities of Water as a Catalyst for Healing in an Urban Oncology Wellness Treatment Centre.

By

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

November 2019

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PROJECT SUMMARY

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RESEARCH FIELD:

Environmental Potential

CLIENT:

Department of Health & CANSA

THEORETICAL PREMISE:

Investigation of the Role of Healthcare Architecture within an

Urban Environment

ARCHITECTURAL APPROACH:

Using Therapeutic Architecture as a design implementation for a new South African healthcare typology as well as the Ecological Regeneration

of Urban Void.

DECLARATION

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

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

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

.....

Carmen Lupiolo Songabau

ACKNOWLEDGMENTS

To the Father Almighty, thank You for Your continuous guidance, blessing and strength throughout my Architectural journey, without Your unconditional favour, I wouldn't be the person I am today. I believe that my purpose lies in architecture and only through You, with You and in You, will I be able to fulfil the path that You have set out for me.

Dr. Nico Botes, thank you for your time, patience and passion. From 1st year to Masters, it has been an honour to be supported and guided by you. Wishing you all the best for next year, I am confident that you will be successful in everything you do.

To my amazing friend, Courtenay, thank you for the endless phone calls, sleepless nights, coffee breaks and laughs. Without you my friend, I honestly couldn't have done it. We've come so far, worked so hard and finally conquered this degree. Our future is so bright, I cannot wait to see what the next chapter has in store for us.

To Tumi and Moyo, words cannot describe how thankful I am for you both. From rendering, to model building to pinning up and praying, you've both managed to lift my spirit and push me till the last minute. I am so blessed to have had your help and even more so to have you both as friends.

To Prince-Levine, my best friend, thank you for believing in me when I didn't believe in myself, for always being my cheerleader, making sure that I'm okay and constantly reassuring me that I can do this, that I am destined for greatness. I can't thank you enough for being there for me every step of the way, I am so grateful for you.

To my parents, Robert and Leonnie, thank you for your undying love, countless prayers, and constant motivation. Your support doesn't go unnoticed, I love you both with all my heart.

Lastly to my siblings, Joy, Grace, Praise and Ronel, thank you for your helping hands, for your understanding, endless encouragement and for your wonderful support and confidence in me. You've all provided me with a sense of strength and resiliency.

caput draconis

DEDICATION

To my best friend, Tamryn.
I miss you more and more every day,
I still love you more and more every day
& I pray for you always.

Thank you for always being an inspiration.

- Your best friend, Carmen.

ABSTRACT

During the minimalistic paradigm of the 20th century, in the quest to attain modern civilization, the ideal reciprocal relationship between architecture and landscape, man and nature, was abandoned as human needs and desires dictated that modern man and his built environment were more important and more powerful than nature.

This drastic disconnect with the natural environment had resulted in the rise of “diseases of affluence” and by the 20th century, in search to find cures, the increase in technological advancements led to the rapid evolution of medical science and an institutional architecture where state-of the art hospitals were designed to accommodate state of the art equipment, which led to a focus on functionality and rationality of form which has greatly affected patient recovery time and overall well-being which led to inhumane “healing” environments.

This dissertation aims to investigate the issue of the existing medical facilities and their disconnect to the natural environment and how architecture can realign its role by acting as a mediator between man and nature, promoting mutual exchange and benefits for the betterment of patient’s overall quality of life, sustainability, social equity, health and resilience. For this reason, the proposed program is an Urban Oncology

Wellness Treatment Centre that would focus on the creation and interconnection between architecture and landscape, as their amalgamation promotes the idea of ‘SLOW LIFE HEALING SPACES’, an idea that promotes a better quality of life not only for patients, but also for families and staff.

The idea that a building can induce healing derives from the concept of Therapeutic Architecture, which according to According to Evangelia Chrysikou, explores various theories and principles such as the theory Ecopsychology, Biophilic Design, Phenomenology and lastly, Regenerative Design, (Chrysikou, n.d.). These concepts focus on the integration of the therapeutic qualities of and sustainability precepts of nature in healthcare treatments and typologies, human-centered design, and the emotional sensorial experience, which will all be investigated to create a basis for the theoretical framework and play an integral part in design and form.

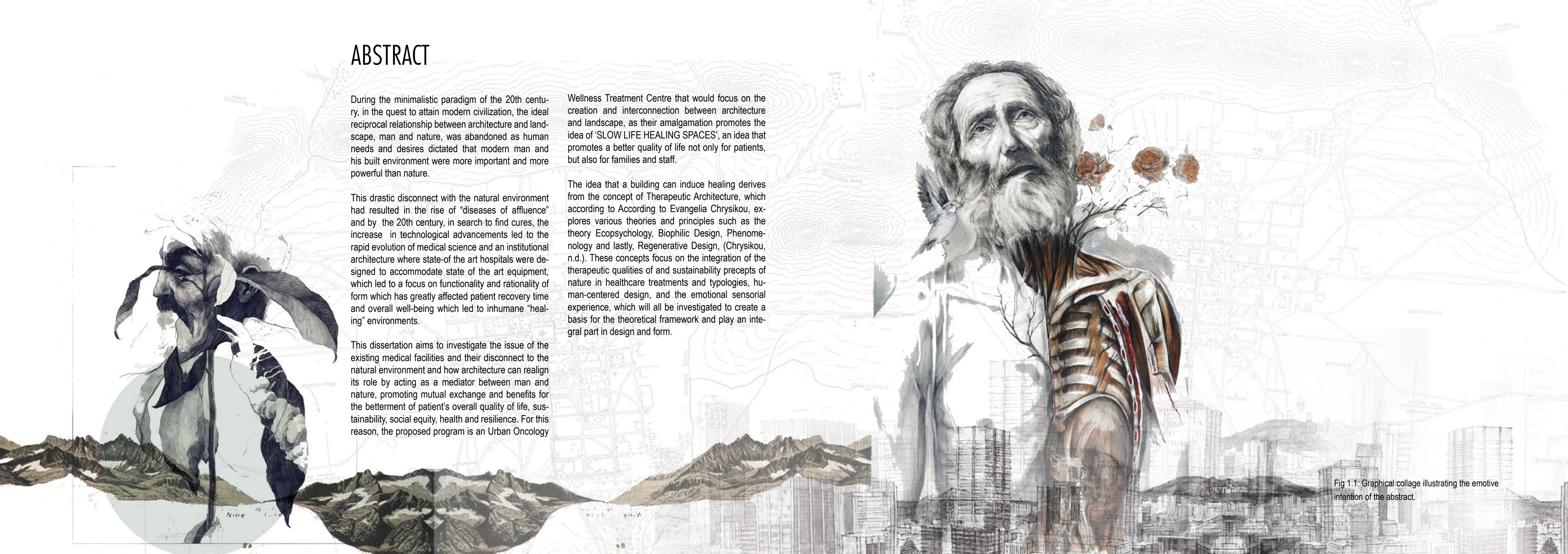


Fig 1.1: Graphical collage illustrating the emotive intention of the abstract.

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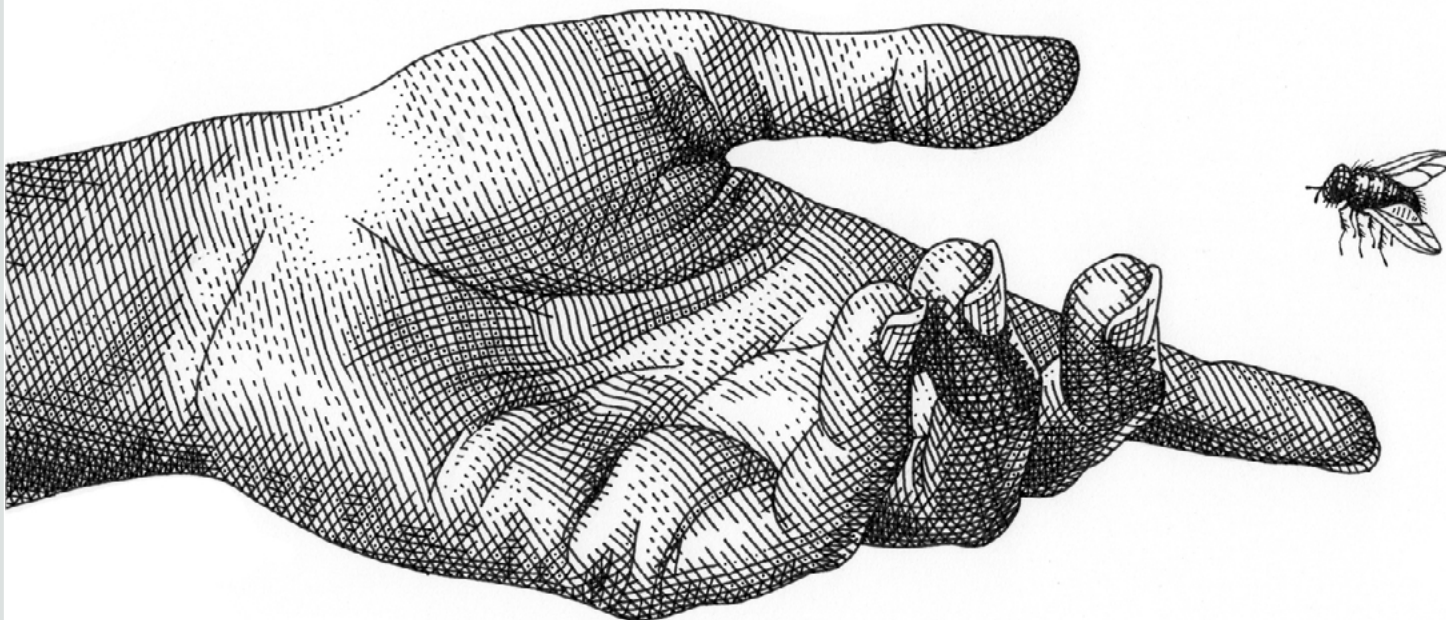
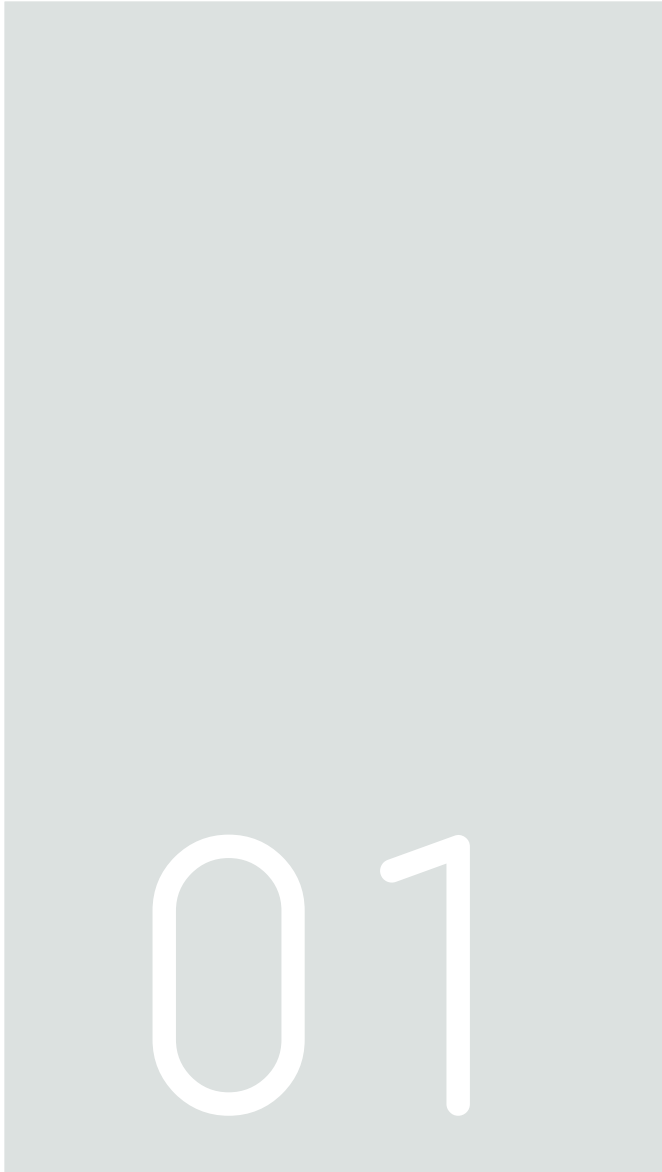
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Fig 1.2: Detailed and intricate cross hatching surreal illustration finding symbolic representations and the balance between man and nature (Knapp,2013)



01.

INTRODUCTION

This chapter aims to investigate form and function by the way in which they isolate patients from public and external environment. This isolation interrupts rehabilitation as it delays recovery and consequently, patients become a replication of their environment.

Fig 1.3: "The Hand" (Knapp,2013).

GLOBAL ISSUE

The ideal relationship and interconnection between architecture and landscape, man and nature, was once a unified living system (Rios, 2013: 200). The prehistoric architectural connotation to this was “building in a landscape (Gardiol, 2016)”; romanticising the relationship between the two. However, due to the minimalistic paradigm of the 20th century, man’s ideals had shifted, and the relationship was abandoned as man’s needs and desires dictated that his built environment were more important and more powerful than nature (Rios, 2013: 201). This expression can be defined as “building on landscape”. (Gardiol, 2016)

During the minimalistic paradigm of the 20th century, in the quest to attain modern civilisation, as he turned his back on the natural environment, unknowingly, man had compromised his very own existence and nature, his primary source of healing, had been affected too and started contributing in creating ailment for its inhabitants.

Fig 1.4: Global Issue; 20th century quest to attain modern civilisation



URBAN ISSUE

This drastic disconnect to the natural environment had resulted in the rise of “diseases of affluence” and by the 20th century, the search to find cures led to the increase in technological advancements and the rapid evolution of medical science and an institutionalised architecture where state-of-the-art hospitals were designed to accommodate state-of-the-art equipment, which led to a focus on functionality and rationality of form which has greatly affected patient recovery time and overall well-being. Consequently, hospitals transformed into inhumane “healing” environments.



ARCHITECTURAL ISSUE

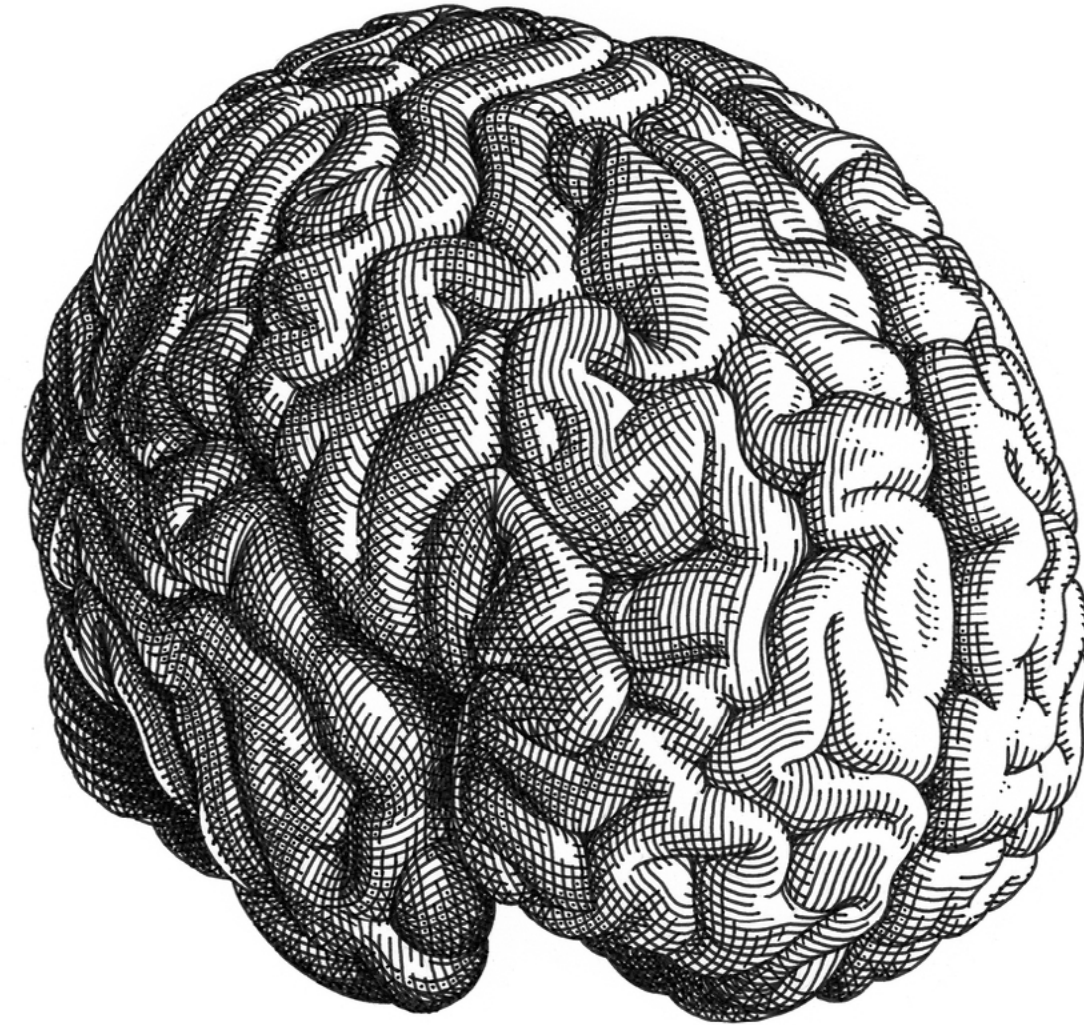
The existing South African medical facilities are synonymous with the prison system, in efficiency, form, function and by the way in which they isolate patients from public and external environment (Mashta, 2010). This isolation interrupts rehabilitation as it delays recovery and consequently, patients become a replication of their environment.

According to Ulrich's theory of therapeutic architecture; multiple professionals, including therapist, sociologists and architects have argued about the physical and mental healing capabilities of a place, space and building, contemplating their physical qualities, trying to determine their ability to effectively induce a healing environment. These elements are imperative for long term care patients; assisting in their recuperation from being exposed to social, physical and emotional volatility as a latent defect of terminal illness.



Fig 1.5: Urban & Architectural Issue; Evolution of medical science led to a focus on functionality and rationality of form which has greatly affected patient recovery time.

02



02.

DISSERTATION INTENTION

This chapter aims to convey and breakdown the dissertation intention and pose the dissertation question in order to further understand the theory of Therapeutic Architecture and how it can be implemented in the healthcare environment.

Fig 2.1: Dissertation intention; "The Brain" (Knapp,2013).

DISSERTATION INTENTION

This dissertation aims to investigate and highlight the issue of the existing medical facilities and their disconnect to the natural environment which has led to a focus on functionality and rationality of form rather than a fluidity of design that focuses on overall good health, comfort and security, therefore, creating inhumane “healing” environments that have greatly affected patient recovery time and overall well-being within the urban environment. Finding an appropriate strategy for the implementation of the South African health care policy therefore becomes crucial and necessary.

The dissertation intends to investigate and introduce a new Healthcare typology that works beyond the treatment of illness to include wellness and well-being by valuing the essence of nature, specifically focusing on the therapeutic qualities of **WATER** and how water can become the **HOLISTIC** thread that combines chemical, natural, physical, mental and emotional treatment., therefore, emphasising a **HUMAN-CENTRED** approach the focuses on the human body being central to an experience that is **MEDICAL, SENSORIAL AND SPATIAL.**

The idea that a building can induce healing derives from the concept of Therapeutic Architecture; which explores various theories and principles such as Ecopsychology, Biophilic Design Phenomenology and Regenerative Design. These concepts focus on human health, ecology and sustainability precepts and emotional experience, which will be investigated to create a basis for the theoretical framework and play an integral part in design and form of a building (Mazuch, 2017).

Furthermore, working with a discarded and decaying site allows for the opportunity to design an architectural typology that would promote a novel life style which transforms the traditional architectural expression, “building in a landscape” to “building as landscape”; by encapsulating the qualities of nature in order to create a healing habitat that would not only encourage human interaction, rest, reflection and healing, but also simultaneously becoming a catalyst for regenerative design, as the return of man back to nature would induce the remediation of a once scarred landscape.

The site ties into the larger vision of the concept, extending the theory of therapeutic architecture to

explore and repair the poor ecological voids in the capital city. The site therefore becomes a patient



Fig 2.2: Therapeutic Architecture; the seamless integration between architecture and landscape.

DISSERTATION QUESTIONS

How can **water** be interpreted spatially to effectively embrace the role of becoming the **mediator** between man and nature to facilitate in creating a stimulating **healing environment** for **cancer patients** in both **public** and **private space** while simultaneously becoming a **catalyst** for regenerative design, inducing the **remediation** of a once scarred landscape?

Sub Questions

1. How can the combination of technical innovation and sensorial experience in architecture express both the ritual and healing affiliations with water in both public and private space?
2. If we ignore qualities of the natural physical context, could we unintentionally slow the healing process and make illness worse?
3. How can we re-examine different levels of privacy in the context of an Urban Oncology Centre?
4. Can architecture use water as a catalyst for the regeneration of living systems by exploring and applying ecological science in the design of buildings and urban cities to reintegrate the relationship between man and nature as a harmonious unified ecosystem?



Fig 2.3: Detailed surreal illustration finding symbolic representations and the balance between man and nature (Knapp,2013)

Research Methodology

Qualitative research methods will be used to reveal the behaviour and perception of users within various existing medical facilities referencing their conditions and tangible and intangible healing environments. This will be investigated through in-depth interviews, case studies and ethnographic research. The results being more descriptive, and the interpretations can be easily collated.

Furthermore, a brief Quantitative data analysis will be compiled through online surveys, face-to-face interviews, systematic observations and the architectural auditing of the buildings to test the hypothesis and the theoretical framework and make predictions and conclusions. This proposal provides a paradigm shift in the planning, experience and understanding of palliative care centres for cancer patients and simultaneously focuses on the restoration the ideal relationship between architecture and landscape as an integrated living system.

Assumptions

It is assumed that the old heritage building, Oost-Eind Primary School, will remain on site and will form part of the larger urban framework.

Due to the nature of the site and the vast amount of water found on the site Hydropower will be integrated into the architectural design.

Limitations

Visits to site will be restricted due to the enclosed and dangerous nature of the site and its surrounding urban context. However, work drawings and a contextual model of the adjacent buildings are available, therefore, the project will be limited in terms of analyzing the existing context or modelling the site.

Delimitations

The concept of Therapeutic Architecture does not suggest that architecture can heal, but rather through architectural manipulation and transformation of space designers can create multiple platforms for natural elements such as light, sound, colour, views, and textures to induce a healing environment that would in turn positively affect the physical and psychological well-being of people

DEFINITIONS

Le Guerisseur

Translation from French to English as “The Healer”

HEALING

Healing is defined as the act of making one whole or soul again, it refers to the balance and contentment of the mental, spiritual and physical state, a holistic and human-centred approach.

CURING

Curing refers to the method or course of remedial chemical medical treatment that rids the patient from disease or any condition.

THERAPEUTIC ARCHITECTURE

According to Evangelia Chrysikou, Therapeutic Architecture refers to "the people-centred, evidence-based discipline of the built environment, which aims to identify and support ways of incor-

porating those spatial elements that interact with people physiologically and psychologically into design“ (Chrysikou, n.d.).

ECOPSYCHOLOGY

Refers to the immersion of patients in the natural environment for them to develop personally and improve their sense of well-being and create a sense of awareness of the mutual dependency that exists between man and nature

PHENOMENOLOGY

Phenomenology refers to the psychological field of design that has become an extension of Therapeutic Architecture. Defined broadly as the “study of structure of experience or consciousness” (Stanford Encyclopaedia of Philosophy), contemporary architectural phenomenology suggests the opportunity of designing for the spatial experience. This approach posits an environment can participate with the body’s innate sensory needs to stimulate and emotional connection with the sense of place, form and space (Lee, 2015). Phenomenology suggests a certain space can interact with the body’s sensory perceptions to

invoke emotive feelings, thereby transmitting subliminal ‘truths’ – like tranquillity, stillness and relaxation – to the semi-conscious.

REGENERATIVE DESIGN

Regenerative Design refers to an architecture that aims to remediate the dichotomous relationship that humans have with nature. It aims to merge and restore this integral part of the intricate and interconnected web of life. Damage to any part of this network effects and causes harm to every other counterpart (Crous, 2016).

BIOPHILIC DESIGN

Biophilia refers to mans the innate inclination and connection to nature. Biophilic design, an extension of biophilia, integrates natural materials such as light, vegetation, landscape views and vistas back into man’s modern built up world

BIOREMEDIATION

Bioremediation is a remedial process that aims to

investigate and treat contaminated and polluted elements found in nature due to human cause such as water. soil and subsurface material, by altering environmental conditions to stimulate growth of microorganisms and reduce pollutants.

PATIENT

Any persons, registered or admitted to receive medical treatment.

HUMAN-CENTERED APPROACH

The design approach centred around humanistic values and devotion to human safety and welfare.

PATIENT- CENTERED APPROACH

Design approach centred around the patient’s journey providing them with the independence, personal control and the ability to make choices in their current unfortunate situation, this autonomy significantly and positively influences the outcome of their medical care.

CANCER

Cancer, also known as malignancy, is defined

as the abnormal growth of biological cells in the body (WebMD, n.d.)

ONCOLOGY

Oncology is a branch of medicine that studies the treatment, prevention, diagnosis, of cancerous tumours.

WELLNESS

the state of being in good health, especially as an actively pursued goal.



Fig 2.4: Map of Pretoria identifying the dissertation's site.

SITE CHOICE

TREVENNA PRECINCT

In choosing an area to work in, it was imperative to consider the current locations and designs of current cancer care centres. Cancer treatment facilities usually form a small part of a greater medical institutions such as hospitals and clinics or they are situated on the periphery of urban cities, deep with in suburban areas.

Their disconnect to the urban environment not only further impacts the health of patients, but it has also greatly affected family, visitors, staff and doctors' attitude, capabilities and responses to sensitive and traumatic real life and death experiences. Their dissociation with the urban environment prevents a sense of normalcy, further emphasizing the drastic changes or traumatic realities of one's journey through cancer treatment. Therefore, choosing to work in the dense urban fabric of the Pretoria CBD would be an appropriate site location as it has the power to reinstate the idea of "home" by creating a sense of normalcy or familiarity, inducing a sense of order, comfort and calm for all peoples involved, especially patients.

Furthermore, to find the most suitable site to achieve environmental regeneration and rehabilitation, various natural elements in the city were analysed and mapped such as water sources, rivers, excavations, mountains, ridges, open green spaces, post-industrial landscapes and most importantly latent urban voids.

As a result, the most appropriate site found is the 14m deep large hole filled with ground water at the deepest northern part of Trevenna's central block. Due to its continuous transformation through excavation, halted construction, relocation of systems, productive activities and poor urban planning, the largest part of the precinct is made up of a dilapidated desolated terrain that used to be the Oost-Eind sports field. This large site can be found in the middle of Trevenna, in its central block

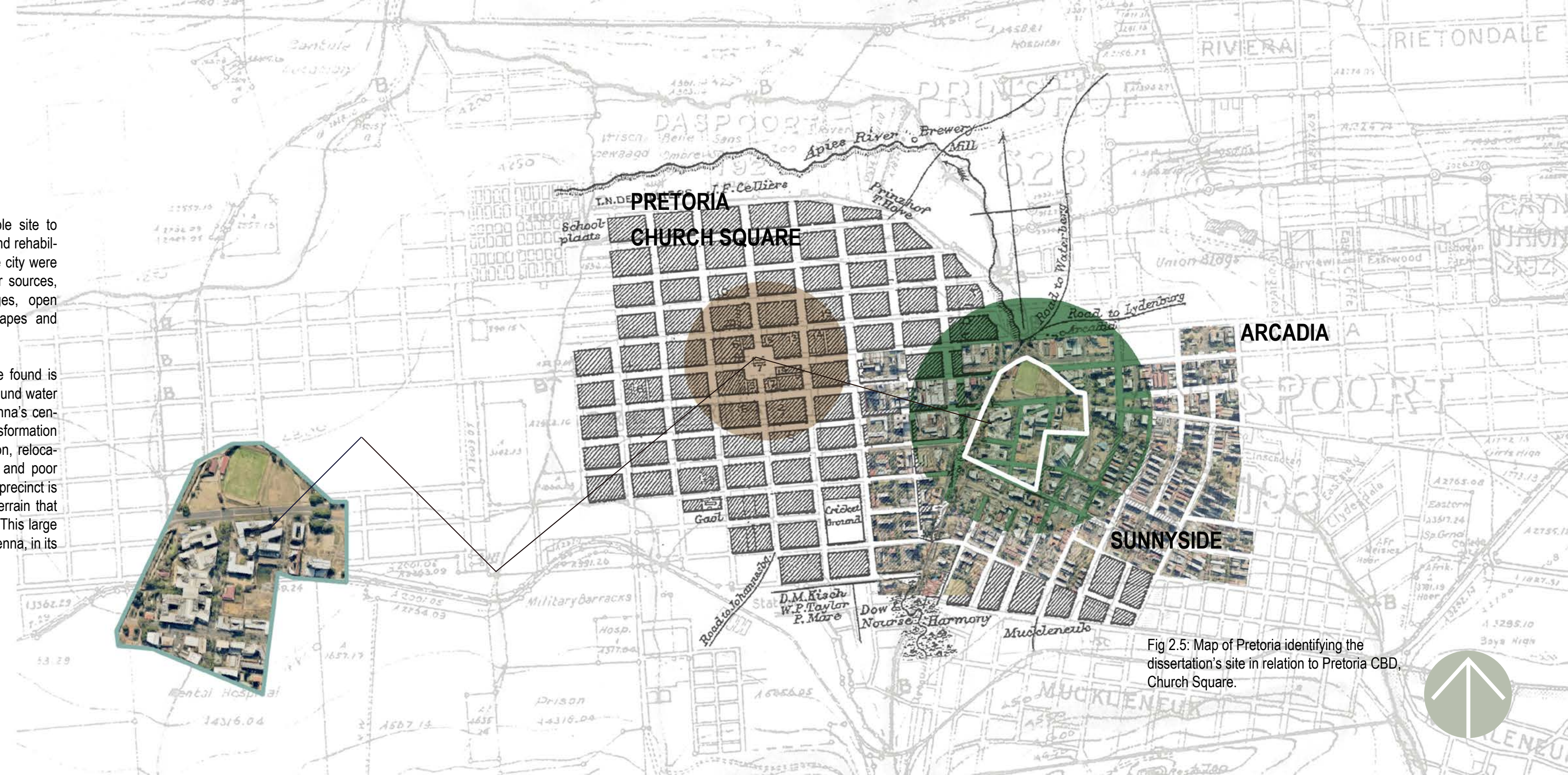


Fig 2.5: Map of Pretoria identifying the dissertation's site in relation to Pretoria CBD, Church Square.

T R E V E N N A .



Fig 2.6: Map of Pretoria locating Trevenna in the context of Pretoria



03

Fig 3.1: "The Lilly"; surreal illustration finding symbolic representations and the balance between man and nature (Knapp,2013)



03.

HISTORICAL CONTEXT & URBAN VISION

This chapter aims to investigate and contextualise the influences of the chosen site to find the appropriate informants and opportunities that would act as catalysts for the mediation between architecture and landscape. The dissertation introduces an urban framework that addresses the issue of latent, derelict and discarded landscapes along Pretoria's eastern periphery which has resulted in the development of Urban Voids and how they can be set into transience by becoming a series of Urban Gardens that would connect and contribute to the city's "Green Link".



Fig 3.2: Historic map of Pretoria's grid layout

CONTEXT

THE ORIGINS OF THE TRANSVAAL TOWN

Pretoria, the Transvaal town, was established in 1855, on the consolidated farms Elandspoor, Daspoort, and Nootgedact in the Apies River Valley with the Cardo and Decumanus running respectively East-West and North-South, crossing Church Square, the ceremonial and focal point of the new Transvaal town centre. The placing thereof was greatly determined by the succession of east-west stretching ranges of hills and valleys surrounding this centre (Hafting, 1991:147, (Jordaan,1989:26).

The rest of the city was developed along a grid pattern that ran parallel to the central main axis. Furthermore, areas that surrounded town were zoned as town grounds and established as land for agriculture, pasture and reserved for the future expansion of the city. (Thomashoff, 1992)

Fig 3.3: Historic map of the early development of Pretoria

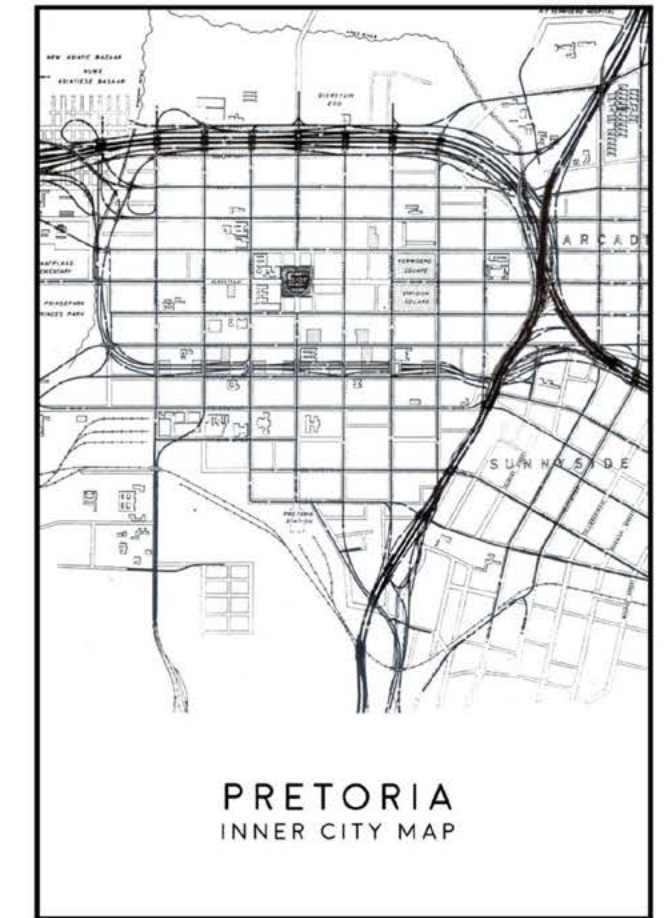
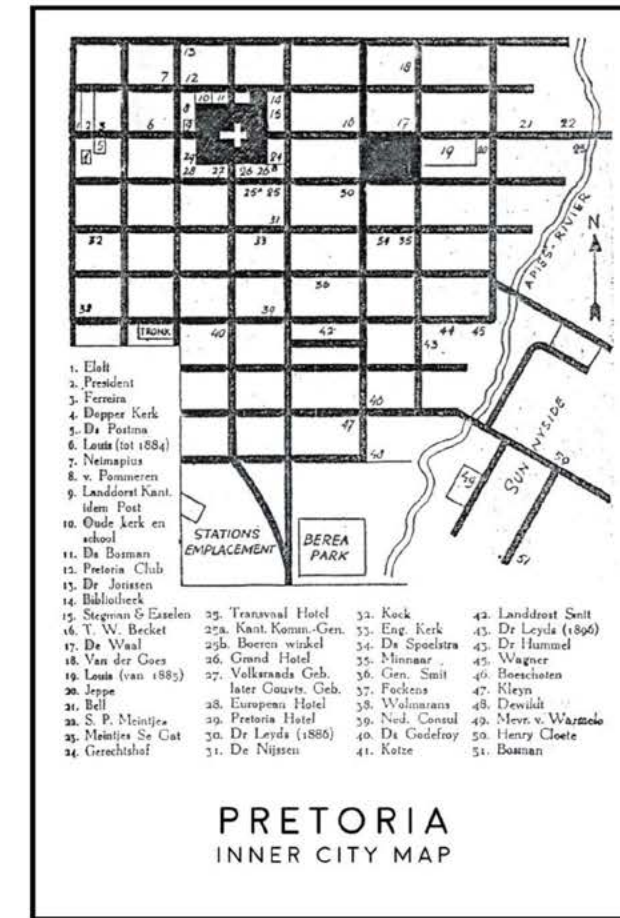
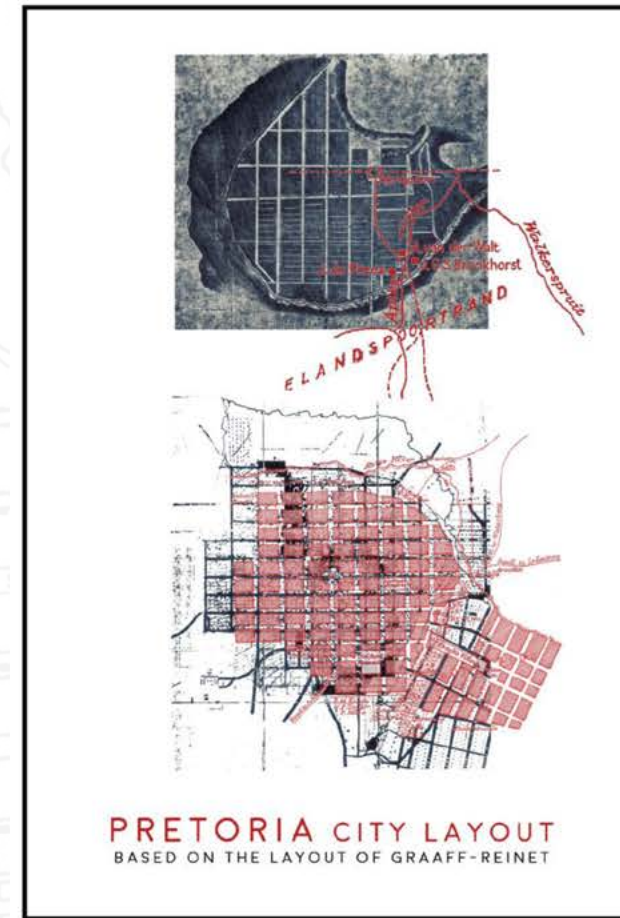
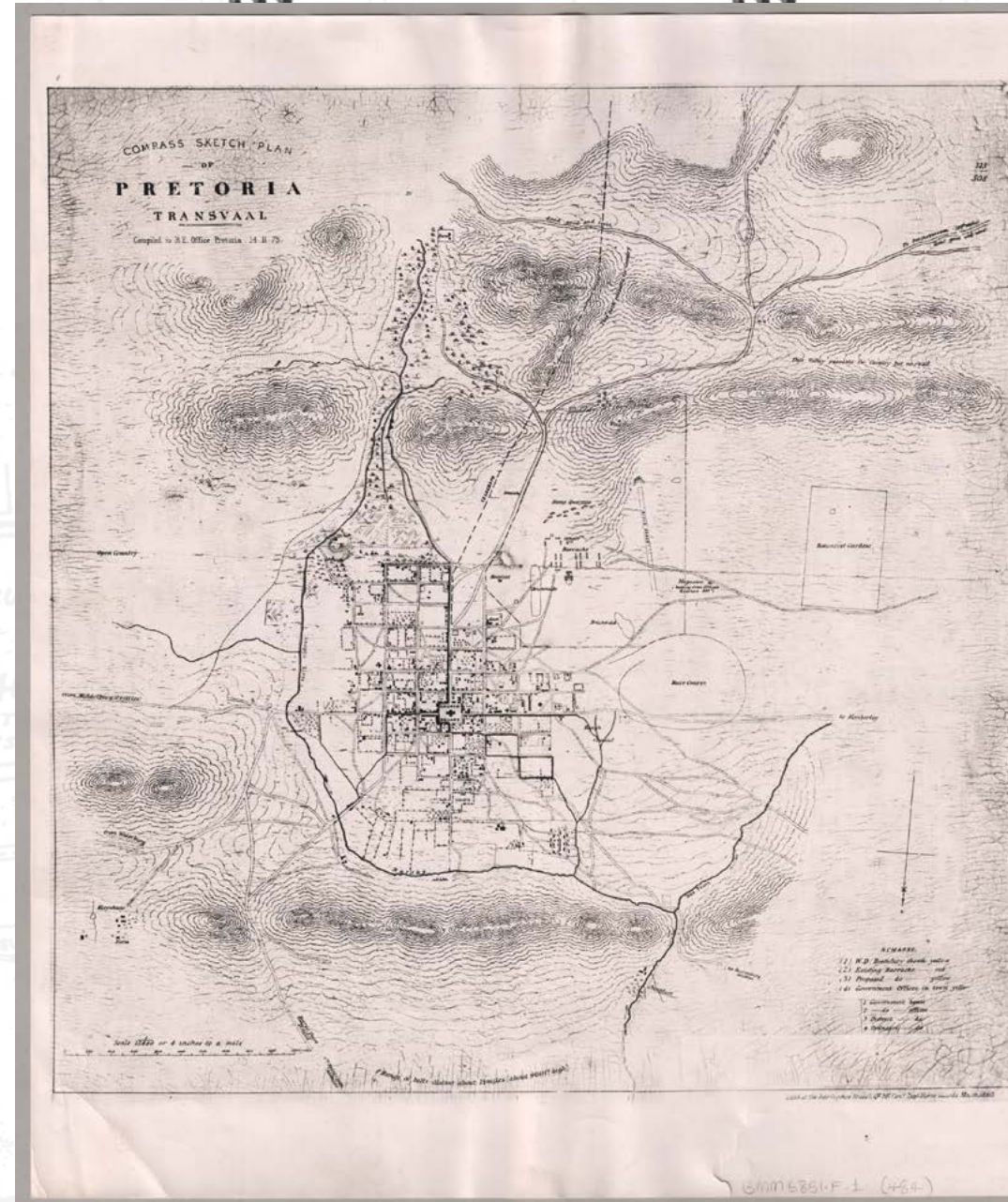


Fig 3.4: Historic map development analysis of Pretoria (Gerber 2018)



Fig 3.5: Historic photographic analysis of Pretoria (Gerber 2018)

A URBAN VISION

THE GREEN LINK

The evolution of the Pretoria's "modernist city" focused on unrealistic ideals, poor principles and mislead urban planning that has contributed to the process of lost green space, decay and a concrete jungle that has resulted in the gradual abandonment and unsustainable, unbalanced and problematic "Urban Voids" within the dense city fabric (Lee, Hwang and Lee, 2015). These "Urban Voids" have led to the increase in the dangers to the growth of the city and her inhabitants by contributing to the rapid increase and dispersed development of unexpected and uncontrolled social conditions creating an inherent detachment to the city's sense of place, therefore, continuously deteriorate the existing urban environment.

This dissertation's Urban Framework focuses on the exploration of the idea of "The Inner-City Urban Voids", specifically addressing the gradual abandonment on the eastern periphery of the city along Pretoria's "Green Belt". The continuous transformation of sites, whether it be through construction, or relocation of systems or productive activities, have created fractures within the urban tissue, leaving the city filled with latent interstitial

landscapes with untapped architectural potential. The urban vision aims to re-evaluate the existing built environment, specifically the quality of urban spatial structure and public and private spaces in both commercial and residential areas.

The Urban Vision has been limited to the original boundaries of Pretoria's "Green Belt" that lies along the Apies River and The Walkerspruit. The two rivers culminate to create one body of water that flows towards the northern boundary of the city towards Daspoort.

Working with the abandoned landscapes, buildings and spaces along the green belt allows for various opportunities for optimal ecological regeneration that can initiate the reconnection between architecture and landscape therefore acting as a catalyst for the remediation of man and nature.

"Urban voids" were identified, extracted and classified into 4 categories - street, individual building, block and edge condition. Focusing on experiences of renewal, regeneration and the reinstatement of the idea of a sense of place city,

these 4 categories were explored to see how they could be reused and set into transience through 'green urban development' (Lee, Hwang and Lee, 2015).

Fig 3.6: Pretoria's Green Belt; Map showing the landscape and topography in the city, while locating Trevenna, the urban framework's area of study



PRETORIA'S GREEN BELT

LANDSCAPE & TOPOGRAPHY ELEMENTS

RIVER
PUBLIC SPACES

The Trevenna Precinct was identified as the area with the largest urban block void. Due to its continuous transformation Trevenna has become one of Pretoria's biggest fractures within its urban tissue, leaving the city filled with a huge latent hole, an interstitial landscape with untapped architectural potential.

Due to its current state, the site is categorized as an urban city "block void" condition that contributes in the spontaneous development of the inherent detachment to the city's sense of place, therefore, continuously deteriorating the existing urban environment. The site falls part of the Urban Visions "Green Link" by becoming one of the biggest "Urban Garden" sites with the potential to contribute the Pretoria's "Green Belt". Therefore, the Trevenna precinct will be used as the site to achieve ecological regenerative design.

The Trevenna precinct will be used as the block vision focus for this dissertation.

THE HISTORY OF TREVENNA

The Trevenna Precinct lies on the edge of the inner City of Pretoria between the two oldest suburbs of the city, Sunnyside and Arcadia, at the confluence of the Apies River and the Walker Spruit. After the establishment of Pretoria as the Capitol of the Union and later the Republic, the growing need for housing resulted in many inhabitants settling on the periphery of the city centre.

Trevenna, Sunnyside and some parts of Arcadia were rezoned and turned into high-density urban areas. These areas became heterogeneous, successful urban spaces with a fine grain, created by the diverse mixture of residential, entertainment and trade, with a compact layout of the different sectors and an ease of access to all parts. Although this occurrence was coincidental and unintentional, it fell within the frame of sound Town Planning principles (Thomashoff, 1992).

Some of the physical remnants of this period in-

clude a few heritage residential houses, several Kirkness face brick garden walls and the Oost-Eind Primary School, which, due to its historical significance and contribution to the city's culture, in 1986, under the NMC legislation, was declared a national monument, and till this day, still stands (South African History Online, 2019).

There have been three distinct historical development phases in the area:

The 1920s: This era saw the early development of the precinct where residential housing and commercial businesses were constructed and established. Only a few examples remain today, notably houses along Gerhard Moerdyk Street that now form the Overzicht Art Village, and a double storey structure on the corner of Esselen and Leyds Street.

1950-1990: Modernist Era led to the development of various new urban visions and city development projects across Pretoria, including the infamous "City Lake" project.

THE "CITY LAKE" PROJECT

In 1987 the City Council of Pretoria embarked on an ambitious inner-city urban renewal programme aimed at bringing life back to the city. The Urban

Vision included an in-depth redevelopment of the old tram sheds, new construction such as the Sammy Marks Square, a commercial public square, the conversion of the Church Square precinct into a pedestrian mall and lastly, the construction of the "City Lake" project in Trevenna.

"
The planned construction of the lake and the freeway landowners in Trevenna wary of maintaining and improving property. The council has also upheld a policy of non-development of public-owned land. Trevenna subsequently has a lower population density and has mostly been left out of the growth period experienced by the rest of the area, leaving a glimpse of old Pretoria and allowing a degree of urban decay to set in"
(Coetzee, 1992)



Fig 3.8: Conceptual Perspective of the City Lake Project by the Department of City Planning (Pretoria Council, 1989).

HISTORIC MAP LOCATING THE PLANNED CITY LAKE PROJECT IN PRETORIA CONTEXT DURING THE 1980' S:

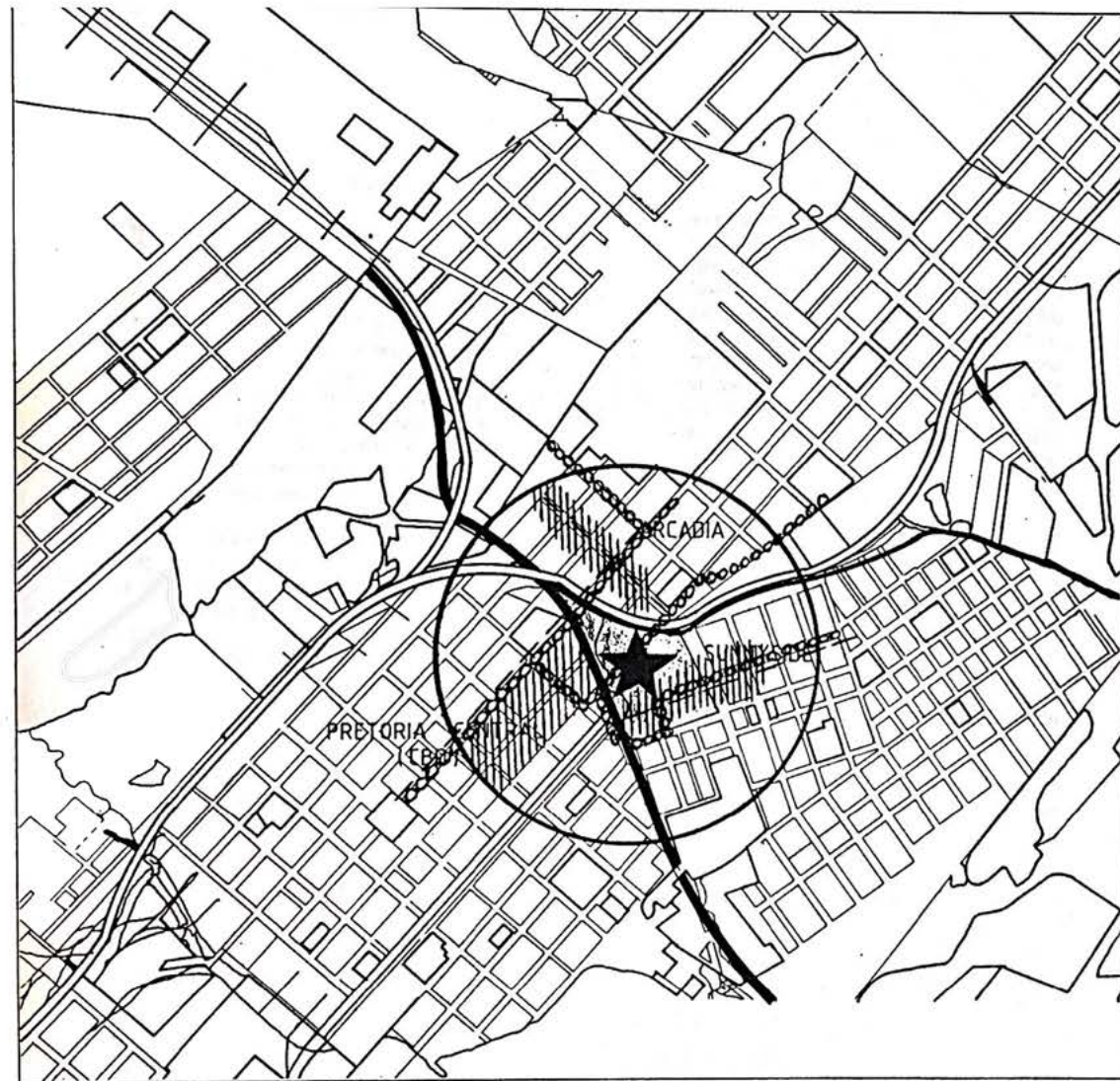


Fig 3.9: Map of Pretoria locating the City Lake Project (Pretoria Council, 1989)

- KEY:**
- APIES RIVER
 - WALKER SPRUIT
 - MAIN TRAFFIC ROUTES
 - MAIN PEDESTRIAN ROUTES
 - BUS ROUTES
 - PEDESTRIAN ATTRACTIVE GROUND FLOOR USES
 - PROPOSED CITY LAKE SITE

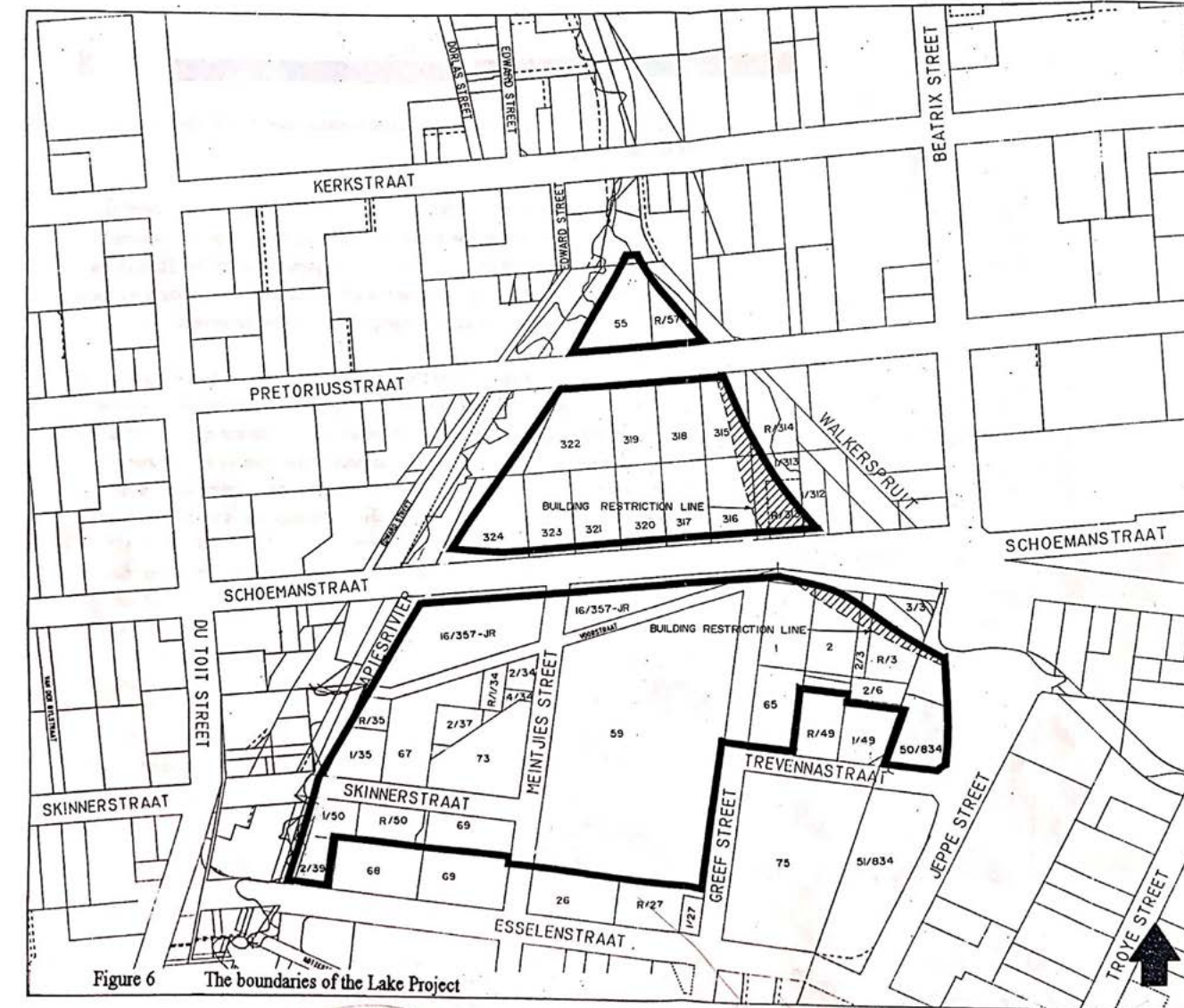
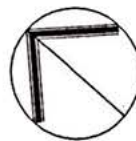


Figure 6 The boundaries of the Lake Project

Fig 3.10: Block plan illustrating the boundaries of the City Lake Project (Pretoria Council, 1989)

The City Lake project was the council's attempt to connect the city to Sunnyside through an artificial lake located in Trevenna (Thomashoff, 1992).

Although the intent of this project was to further enrich the city by connecting her back to the suburban periphery through the creation of visual and physical links therefore enriching the users experiential journey in the urban environment, the project was unsuccessful due to its unrealistic ideals and poor and excessive planning that not only contradicted itself but also insisted on the construction of an artificial water body, ignoring the existing infrastructure of both the Apies River and the neighbouring Walker Spruit. (Thomashoff, 1992).

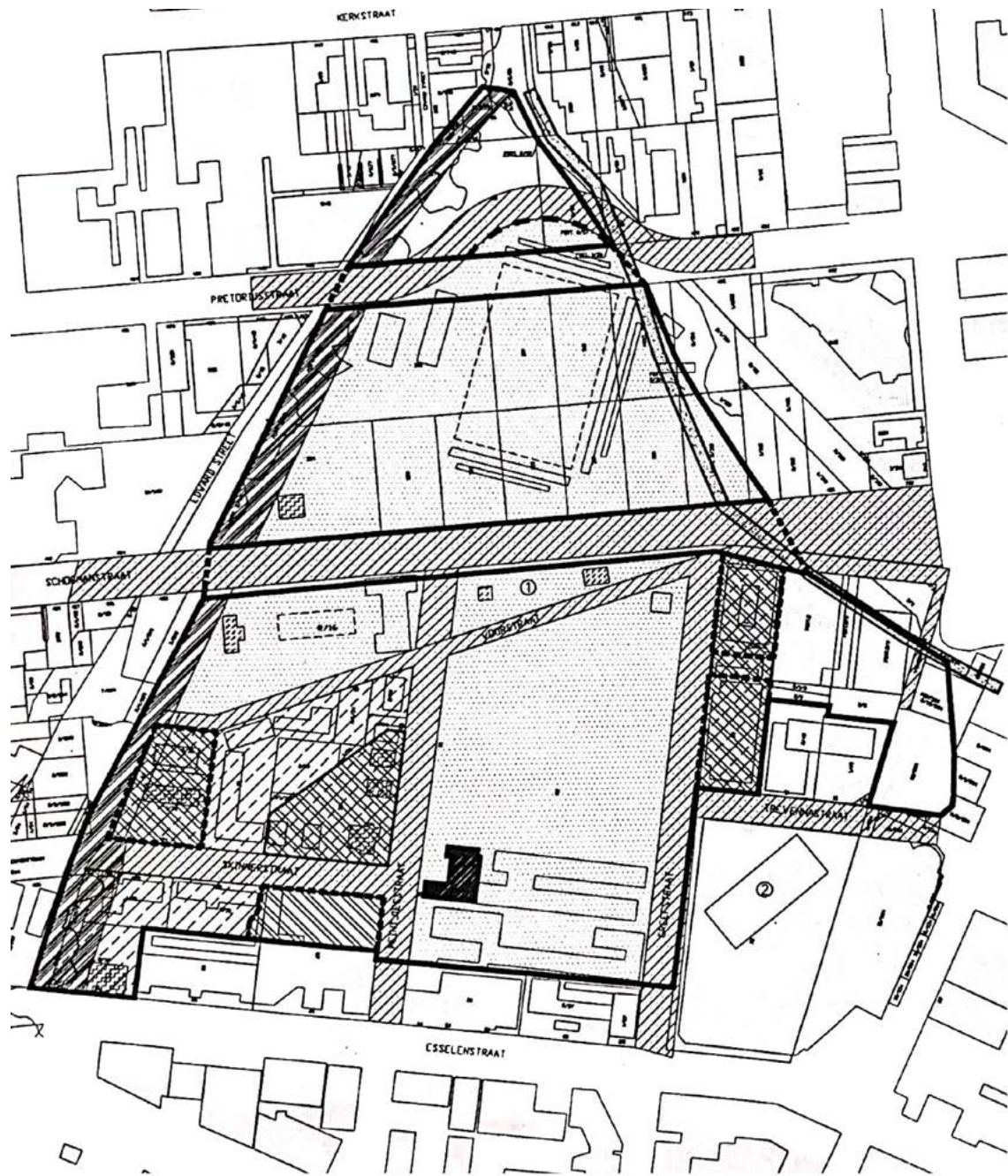
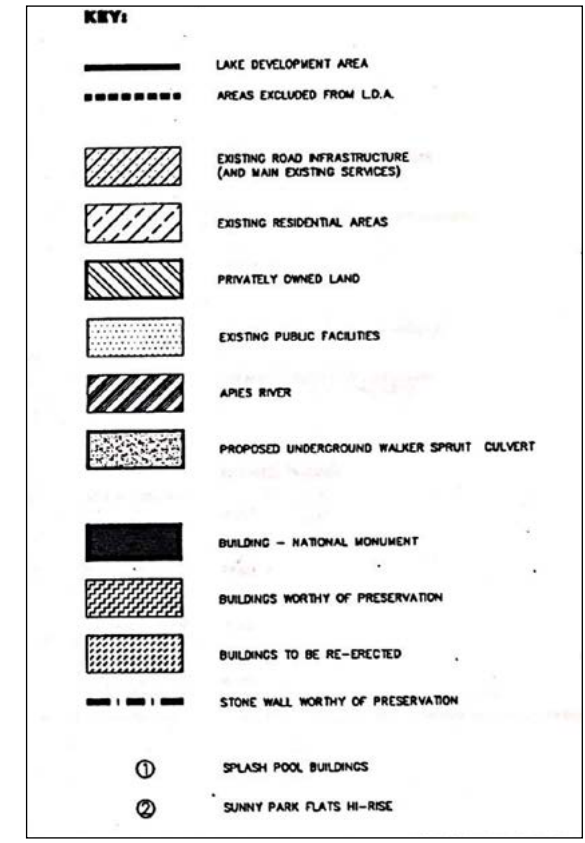


Fig 3.11: Site Analysis of Trevenna (Pretoria Council, 1989)

SITE ANALYSIS MAP OF TREVENNA



MAP OF EXISTING URBAN FORM

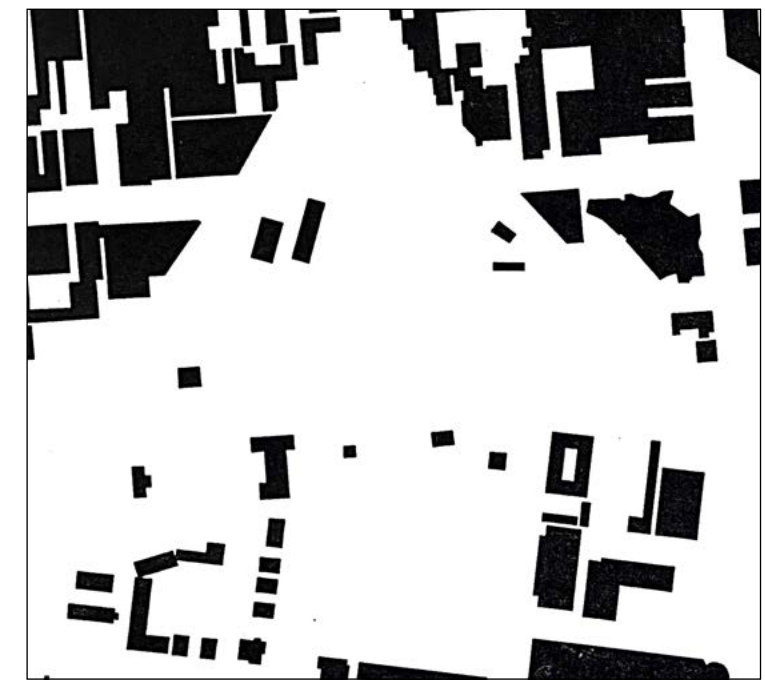


Fig 3.12: Existing Urban Format (Pretoria Council, 1989)

MAP OF TREVENNA OUTLINE OF PLANNED LAKE

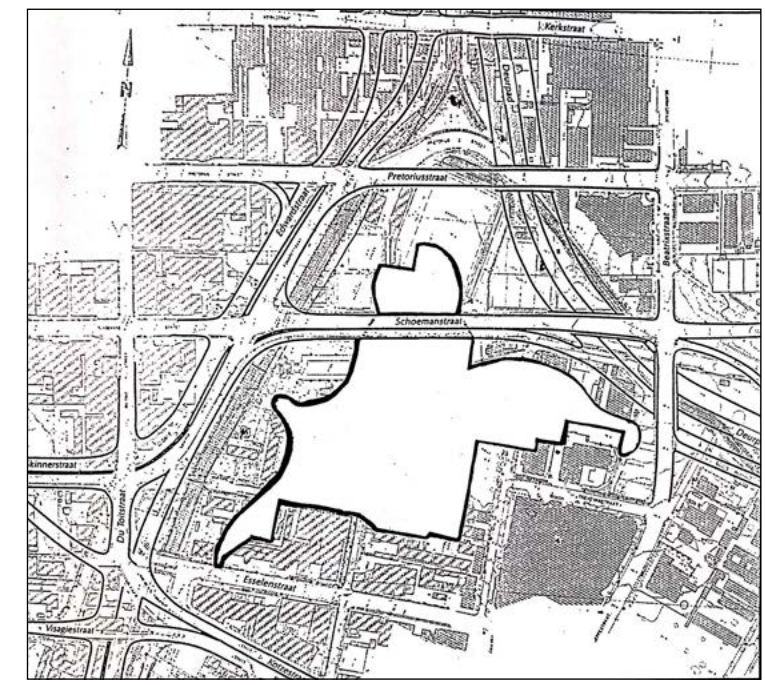


Fig 3.13: Outline of the planned lake (Pretoria Council, 1989)

MAP OF LANDSCAPE, OPEN SPACE & LANDMARKS

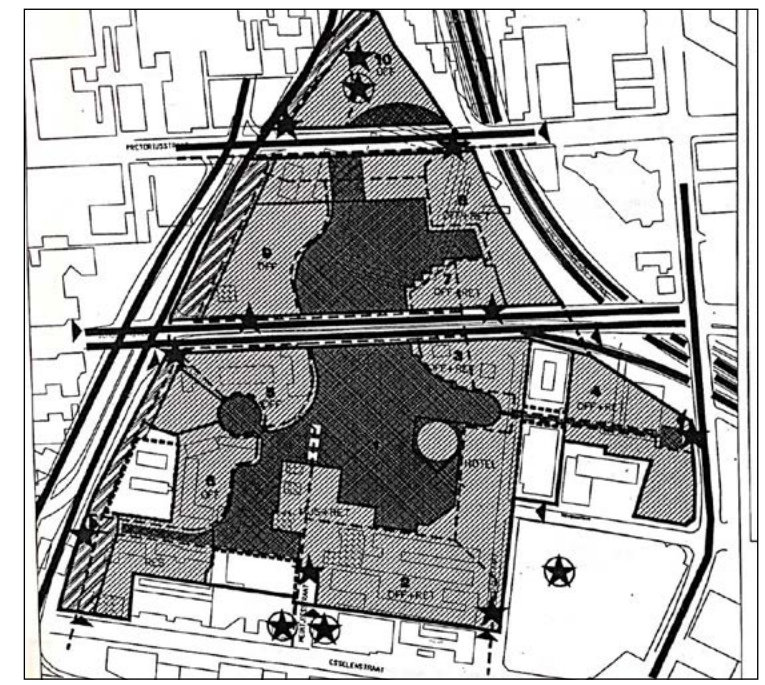


Fig 3.14: Map of Landscape, open space and landmarks (Pretoria Council, 1989)



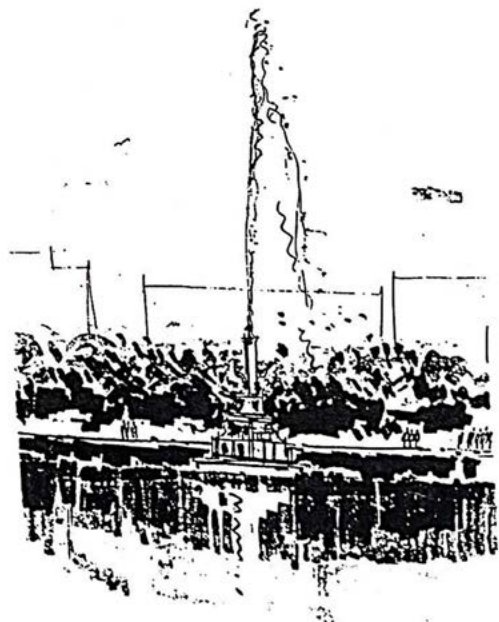
THE CITY LAKE PROJECT

DEVELOPMENT FRAMEWORK MAPS



THE WATER TERRACE

The Water Terrace starts at the proposed residential area and flows down to terminate at the lake. Map of Landscape, open space and landmarks. Fig 3.15: The Water Terrace (Smith and Pienaar, 1992).



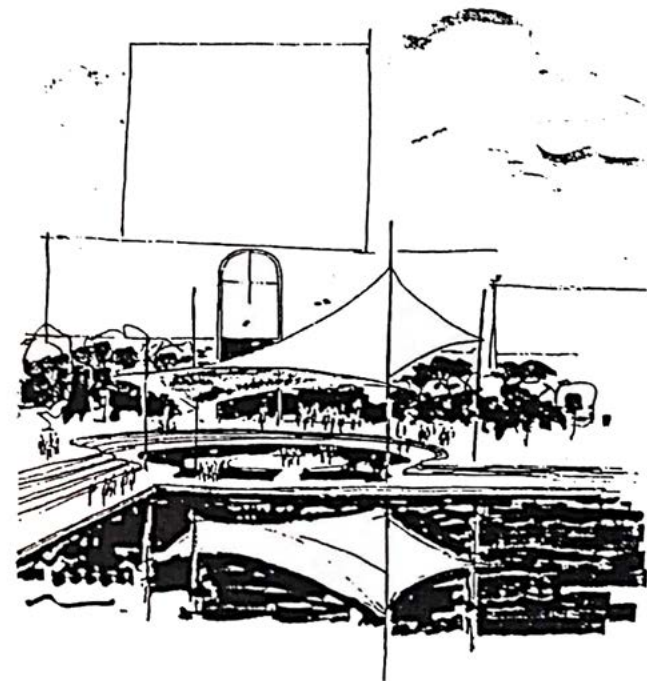
THE PRETORIA FOUNTAIN

The Pretoria Fountain was designed to become the focal axis point of the entire project. Fig 3.16: The Pretoria Fountain (Smith and Pienaar, 1992).



THE LAKE POOL

Public swimming pools and adjacent water parks were intended to form part of the lake. Fig 3.17: The Lake Pool (Smith and Pienaar, 1992).



THE AMPHITHEATRE

The sheltered amphitheatre would be in the most south-easterly corner of the lake project and will form part of the new retail link. Fig 3.18: The Amphitheatre (Smith and Pienaar, 1992).



THE WATER CHANNEL

A water channel would be designed to connect and lead users from the Walker Spruit Fountain source to Mears street and the lake, guiding users towards the big body of water. Fig 3.19: The Water Channel (Smith and Pienaar, 1992).

CONCEPTUAL PERSPECTIVES
OF THE CITY LAKE PROJECT

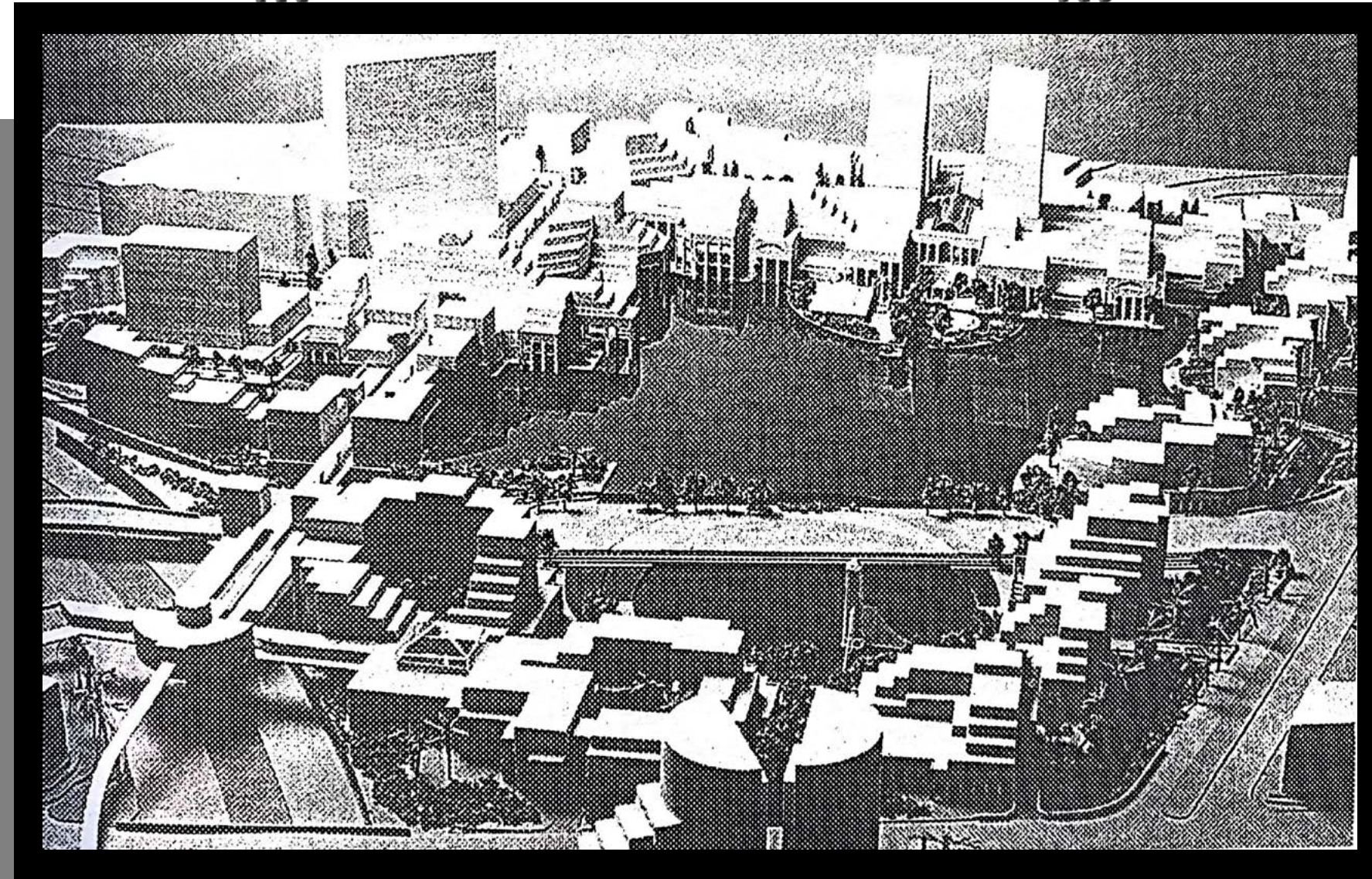
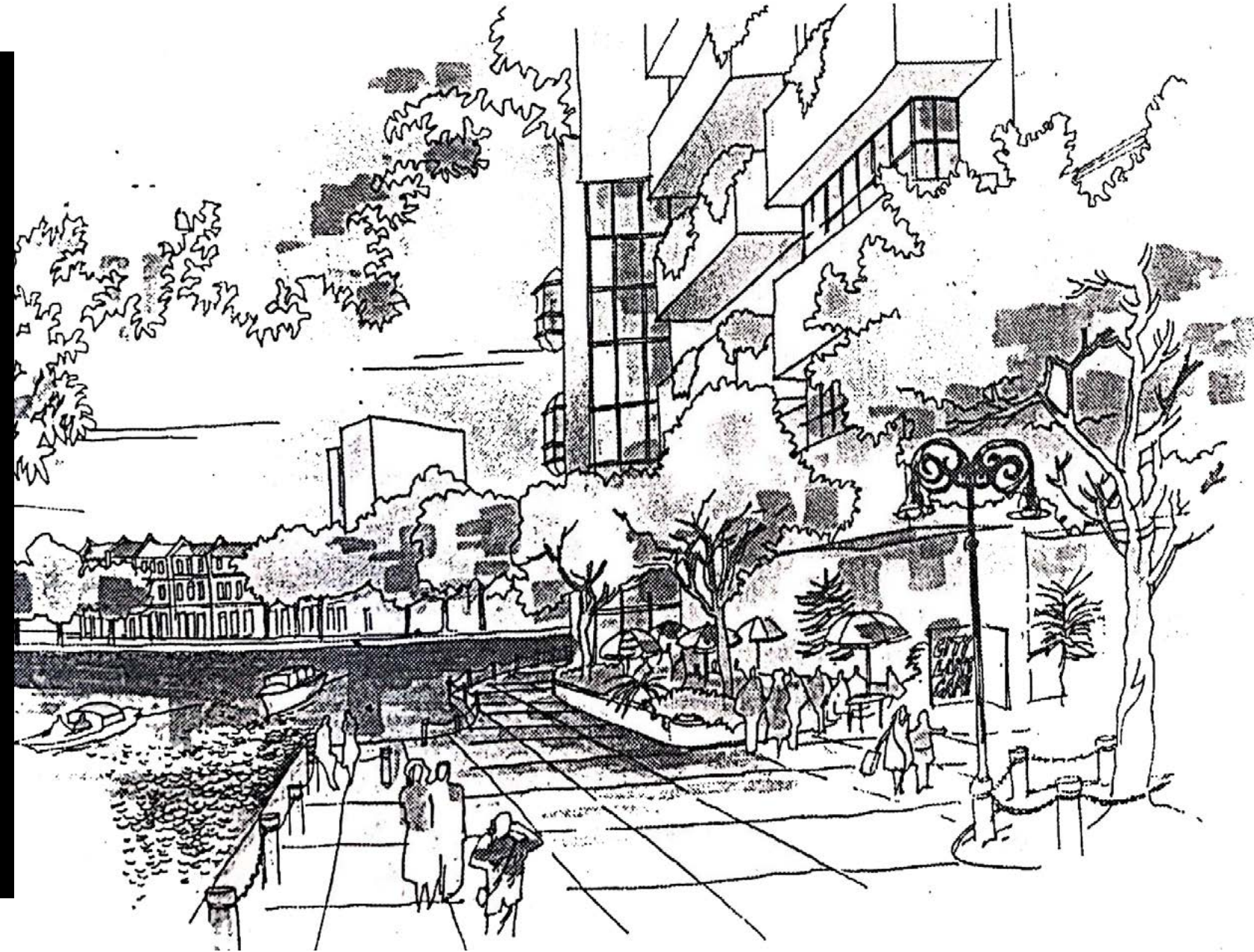


Fig 3.20: Conceptual model of the City Lake Project by the Department of City Planning (Smith and Pienaar, 1992).



Another reason for the failure was the brutal way in which new commercial, retail and recreational facilities were being envisaged without taking the prevailing context into account and no consultation with the city council developer.

Fig 3.21: Illustration by The Department of City Planning showing the experience of the Pretoria City Lake Project



TREVENNA TODAY

Fig 3.22: Map of Pretoria locating Trevenna, the urban framework's area of study.

MACRO CONTEXT

“The city is an artefact in continuous modification and the pulse for transformation has crossed, for a long time, the construction of urban fabric, its growth and its subsequent evolution” (Setti, 2013;p.52).

Fig 3.23: Showing the current state of the Trevenna Precinct.

After the failure of the “City Lake” project, further unrealistic urban planning was proposed for Trevenna which subsequently led to the failure of any future development and the gradual abandonment of the precinct. In 2006, Trevenna was rezoned to become a business district forming part of the greater western commercial area of Sunnyside.

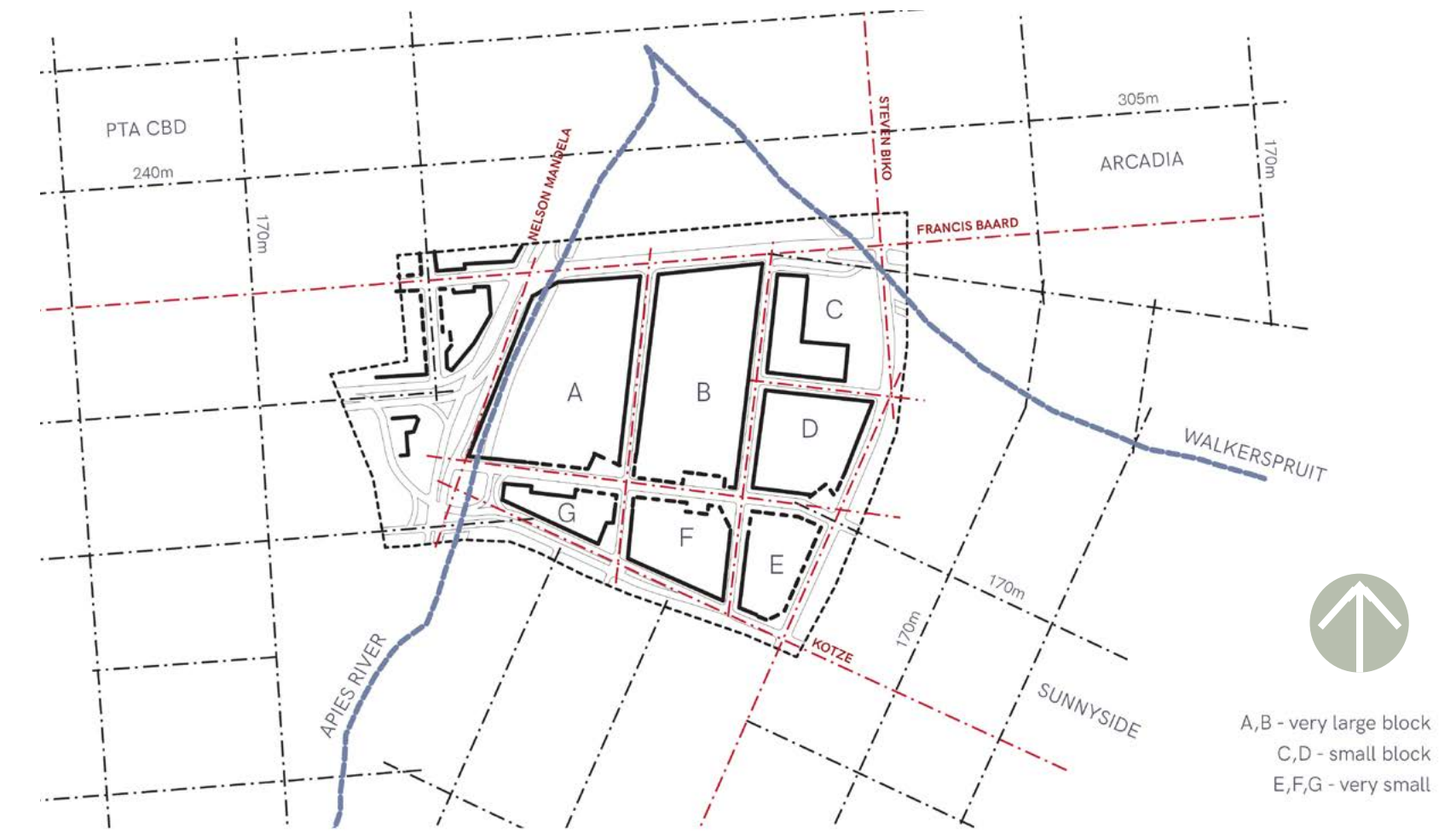
The area includes both the Department of Trade and Industries and the Department of Mineral Resources office blocks, the old Oost-Eind primary school that has been kept as a civil social facility and high-density residential, commercial and retail blocks on the eastern and southern edges of the area. The area is bordered by the tall Sunnypark Shopping Centre and the Department of Tourism on Greeff street, with the Caledonian Stadium in the south. The North, East and Western borders of Trevenna are still defined by the Apies river and the tributary, Walker Spruit.

Although both rivers have been canalised, they merely act as storm water channels, defined by infrastructure such as roads of the banks.





Fig 3.24: Aerial Photograph Trevenna.



URBAN MORPHOLOGY

Block analysis

Fig 3.25: Map of Trevenna illustrating Urban Morphology (Visco[city] Urban Framework, 2019).



NATURE VS. BUILDING

POOR RELATIONSHIP BETWEEN NATURAL
LANDSCAPE AND BUILT ENVIRONMENT :

The limited amount of natural landscape in the area for the built environment to interact with has resulted in a fragmented landscape. Furthermore, where natural landscapes are present, buildings encroach onto the natural environment in an underwhelming and unengaging manner, therefore emphasising the disconnect between architecture and landscape in the city (Visco[city] Urban Framework, 2019).

Fig 3.26: Showing the current disconnect between architecture and landscape, man and nature in the Trevenna Precinct (Visco[city] Urban Framework, 2019).



MOVEMENT SOCIAL INTERACTION, BUSINESS and ENVIRONMENTAL balance:
Although limited, the natural landscape dictates the pedestrian movement, shaded areas allow for pause and rest areas therefore igniting social interaction and the start and spread of informal trading.

Figure 3.28: Showing the current informal trading and pause areas created underneath the natural canopy of trees (Visco[city] Urban Framework, 2019).



Fig 3.28: Showing the current disconnect between architecture and landscape, and the poorly maintained Apies River (Visco[city] Urban Framework, 2019).

HYDROLOGY

The Apies River, flowing in the north-south direction, cuts through 3 main ridges, Salvokop, Witwatersberg and the Magaliesberg. The topography of these 3 ridges has developed an urban grain and form in the east-west direction. (Van der Walt, 1967:6-7)

The Trevenna Precinct, located at the confluence of the Apies river and the Walkerspruit, has a unique organic nature and landscape pattern due to the evident ecological features and influences of topography, therefore creating a unique urban grain. The disconnect between the built and natural environment has led to the deterioration of species, biomes and natural elements such as the Apies river. The Apies river has been channelized, poorly maintained and no longer holds as much historic value significance to the city as it once did.

TOPOGRAPHY

The Apies River, flowing in the north-south direction, cuts through 3 main ridges, Slacokop, Witwatersberg and the Magaliesberg. The topography of these 3 ridges has developed an urban grain and form in the east-west direction. (Van der Walt, 1967:6-7)

The Trevenna Precinct, located at the confluence of the Apies river and the Walkerspruit, has a unique organic nature and landscape pattern due to the evident ecological features and influences of topography, therefore creating a unique urban grain.

GREEN BELT

As shown in figures 3.31 & 3.32, the Poor Relationship Between Natural Landscape and Built Environment has caused a distinctive separation between the built environment and the natural landscape in the area. Infrastructure and landscape work and exist independently, therefore, there is an opportunity to create an architecture that will reinstate the balance between the two, allowing city dwellers to interact with both simultaneously.

Furthermore, the limited amount of natural landscapes has been programmatically changed as they have been appropriated and used as vehicular parking lots.

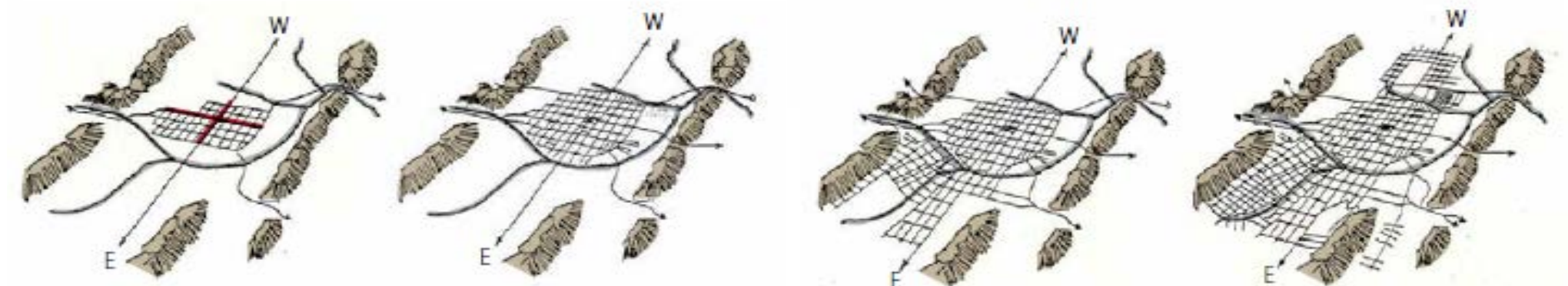


Fig 3.33: Showing the Topography development of Pretoria (Labuschagne, 2010).

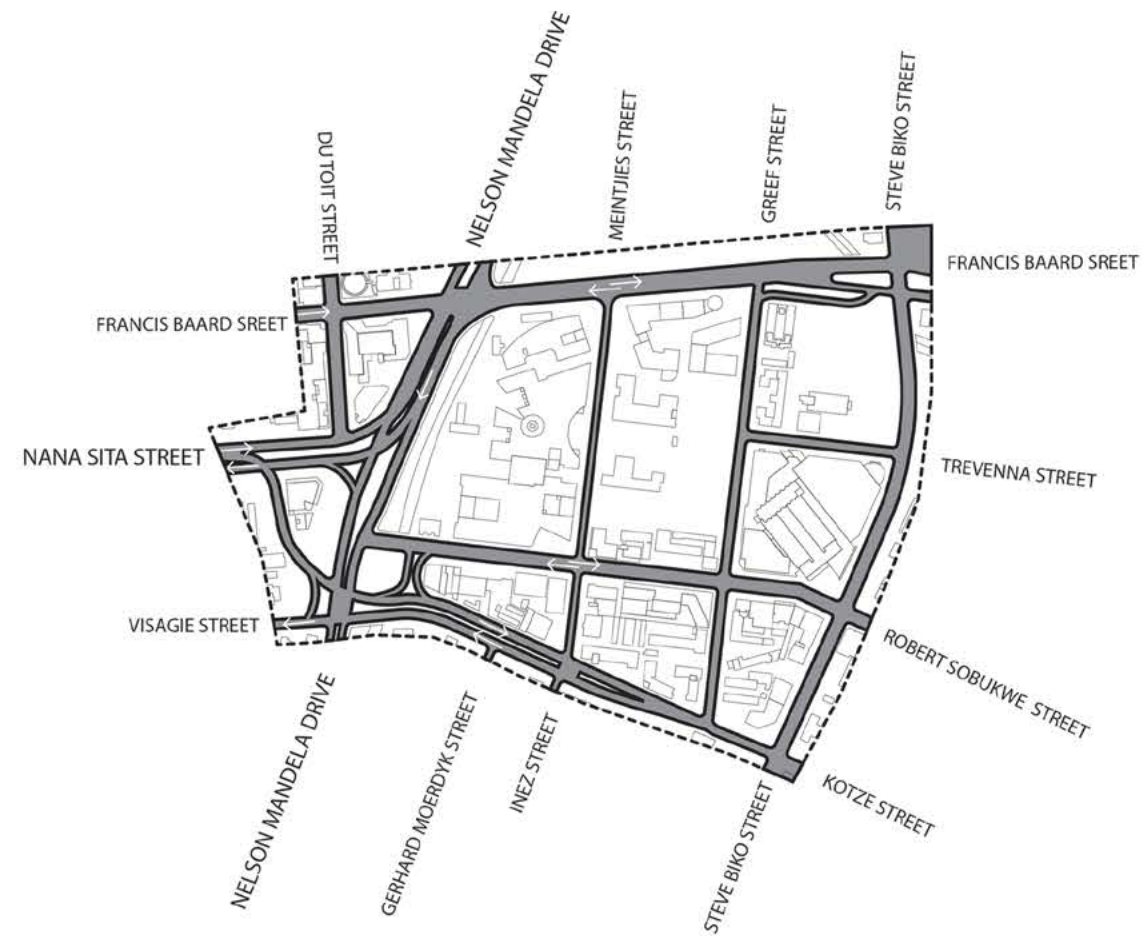


BUILDING STOCK

Block analysis

- Residential
- Restaurant/Bar
- Retail/Service
- Church
- Education
- Theatre
- Mixed Use

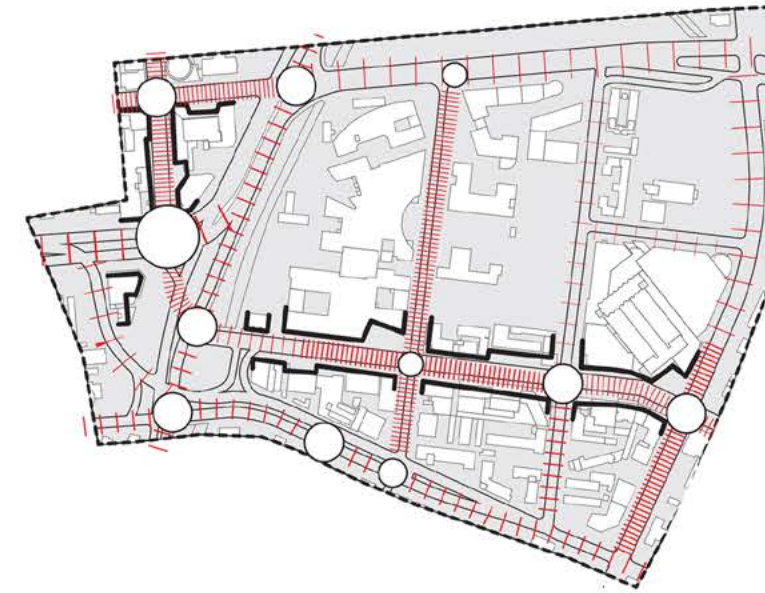
Fig 3.29: Block analysis Trevenna (Visco[city] Urban Framework, 2019).



VEHICULAR REALM

Block analysis

Fig 3.30: Map of vehicular realm in Trevenna (Visco[city] Urban Framework, 2019).



PEDESTRIAN REALM

Block analysis

- Low pedestrian activity
- High pedestrian activity
- Low traffic interference
- High traffic interference

Fig 3.31: Map of pedestrian realm in Trevenna (Visco[city] Urban Framework, 2019).



GREEN SPACES

Block analysis

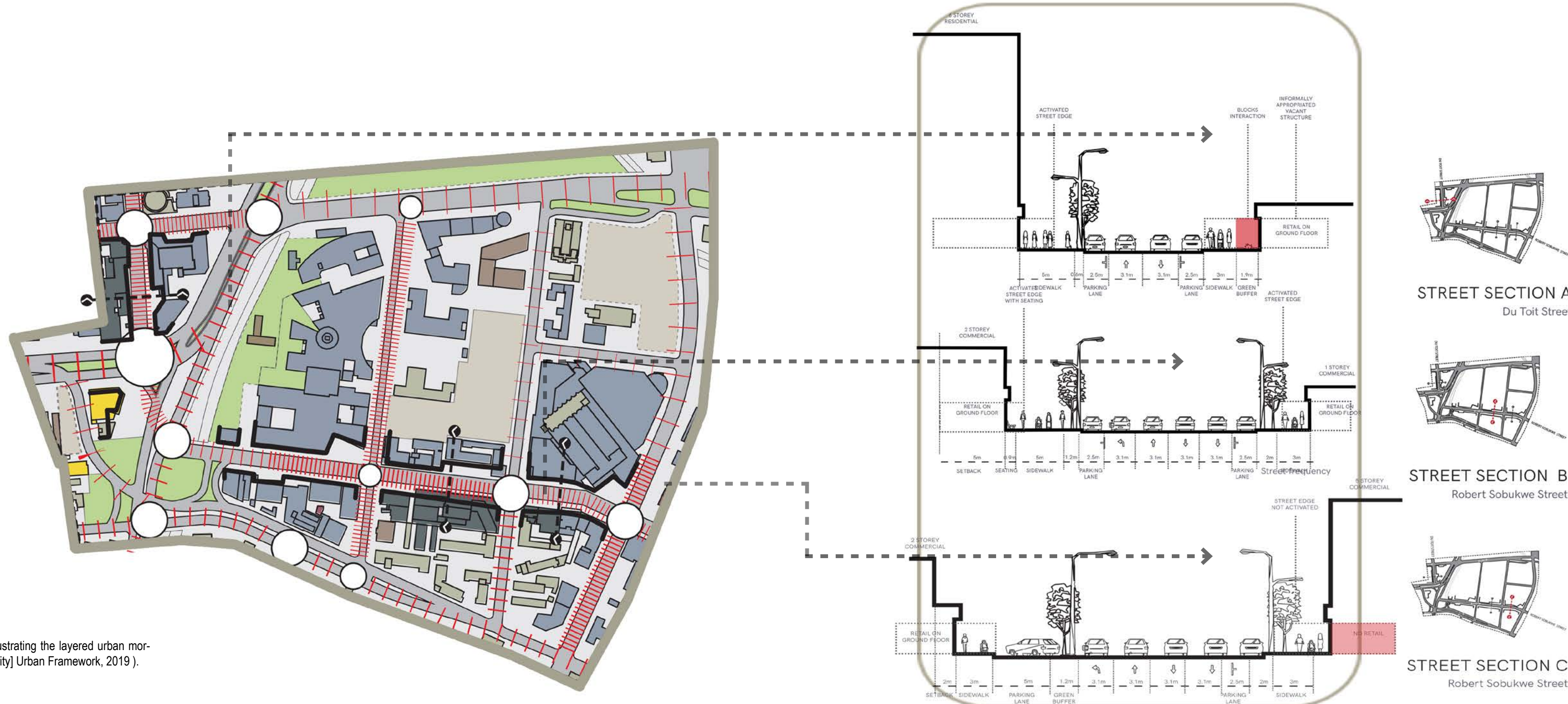
- Public
- Private
- Restricted access
- Soft landscape
- Vacant plot

Fig 3.32: Map of green spaces in Trevenna (Visco[city] Urban Framework, 2019).





Fig 3.3: Map of Trevenna illustrating the layered urban morphology of Trevenna (Visco[city] Urban Framework, 2019).

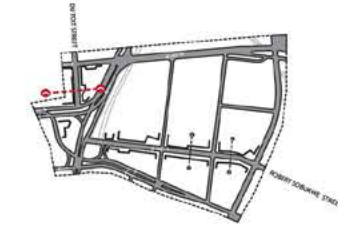


LAYERED MAPPING

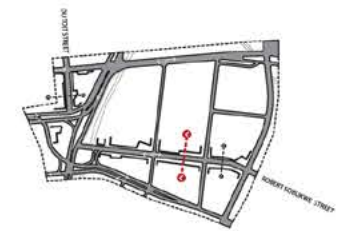
Layered mapping showing the current friction and disconnect that exists in Trevenna. Consequently, this has led to an unsupervised, desolate latent precinct full of potential. The sections illustrated in Figure 3.34 show the inhumane building scales that completely disregards and isolate pedestrians in the area, this has led to a diminished public interface as dwellers avoid using certain spaces.

Furthermore, the building to landscape ratio shows the evident friction that exists between the two; the lack of green space in the dense urban environment has led to an unsustainable concrete jungle.

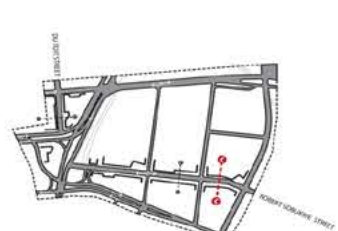
The decrease in natural conservation directly reduces the flora and fauna biodiversity, affects the urban climate by increasing the air temperature which leads to the development of urban heat islands, worsens air quality and further increases the amount of air pollution, carbon sequestration. (Rakhshandehroo et al., 2017:10).



STREET SECTION A
Du Toit Street



STREET SECTION B
Robert Sobukwe Street



STREET SECTION C
Robert Sobukwe Street

Fig 3.34: Public Interface: The sections illustrated the relationship between building and user. show the inhumane scale (Visco[city] Urban Framework, 2019).

A NEW URBAN VISION : *the green link*

“From the historical time period, human being has appreciated greenery to and the flavour of life, form some physical and psychological dependency on nature. People depend on fresh air, natural attraction and landscape which indicate public natural perception and social behaviour” (Rakhshandehroo et al., 2017:10).

Therefore, it is imperative that the design considers the significance and benefits of green spaces within the urban environment as they contribute to creating balanced humane and social welfare and contribute in the development of liveable and sustainable cities (Rakhshandehroo et al., 2017:10).

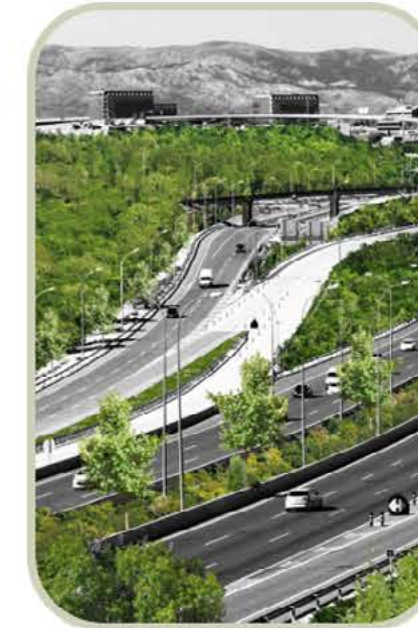
The Urban Framework, extends itself into the theory of Therapeutic Architecture, focusing on the reintegration of nature into the city, conceptualizing and redesigning latent spaces to create a green link within the dense urban fabric that would be referred to as an “Urban Garden”.

The Green Link intends to combine all 4 “Urban voids” categories, street, individual building, block and edge condition, into one integrated green ecosystem along Pretoria’s Green Belt. Focusing on experiences of renewal, regeneration and the reinstatement of the idea of a sense of place. The Green Link aims to grow various urban garden complexes, green seams, remediate the Apies river into one organic and robust cluster in the city.

Users can access this green link from various parts of the city. Conventional low-level technology which involves planting and greening and environmental high technology which includes water preservation and conservation are applied and integrated into these derelict landscapes to potentially rehabilitate poor ecological conditions found on neglected and excavated sites.



Fig 3.35: Green Link design informants



Street Edges



Building facades



Rooftops



Latent plots

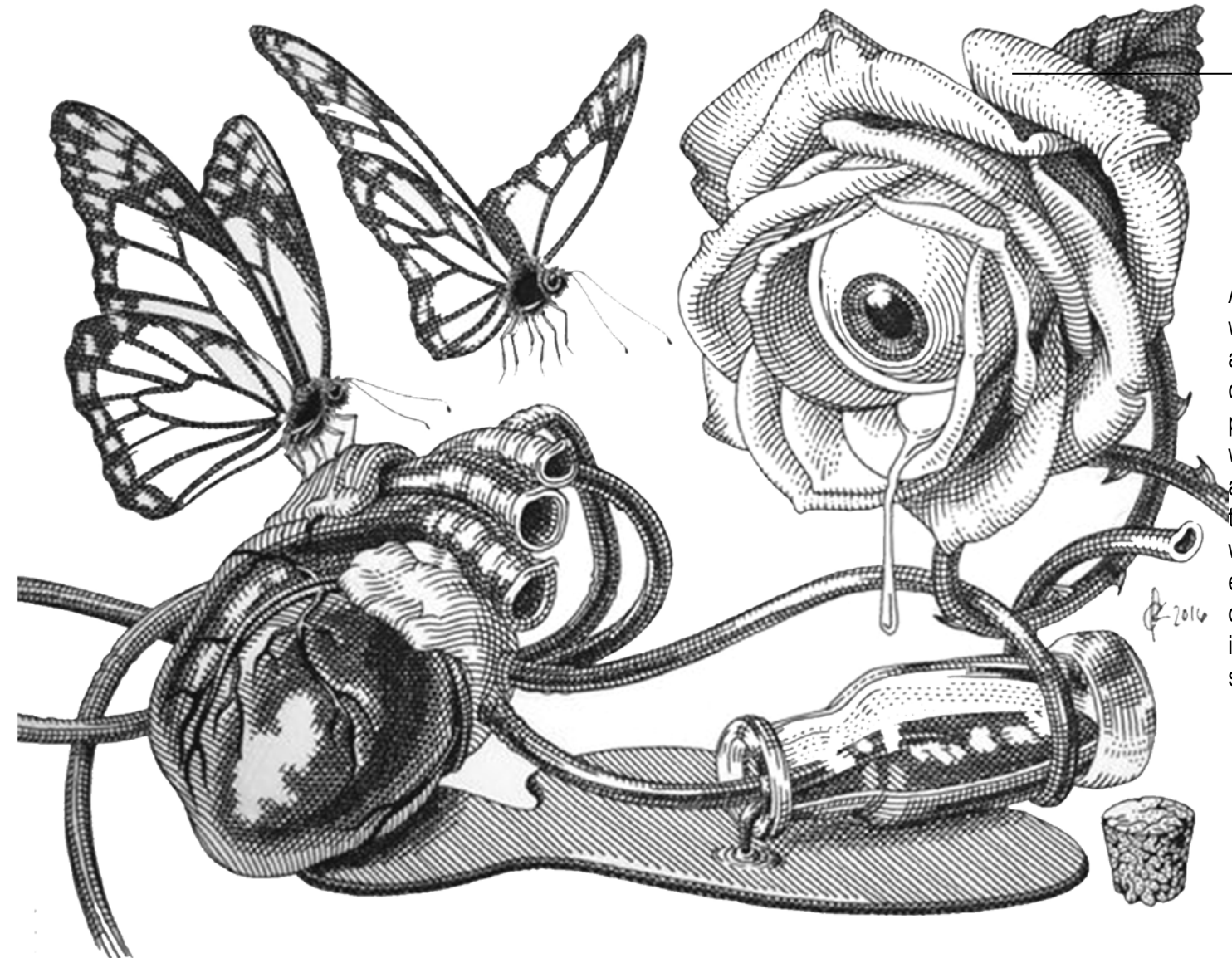


Pedestrian walkways



Rivers

Fig 4.1: "The Heart" (Knapp,2013).



SITE ANALYSIS

An 'Urban Block' vision of the Trevenna precinct will be explored to find the historical, cultural and ecological influences that will inform the site chosen for this dissertation, which will become a proposal for a regenerative 'Urban Garden' that will form part of the 'Green Link'. An in-depth site analysis will be used to identify the tangible, intangible physical qualities of the landscape that will become the site informants, ultimately influencing and inspiring design possibilities. Most of these qualities will be of an ecological nature in order to promote bioremediation of a once scarred landscape.

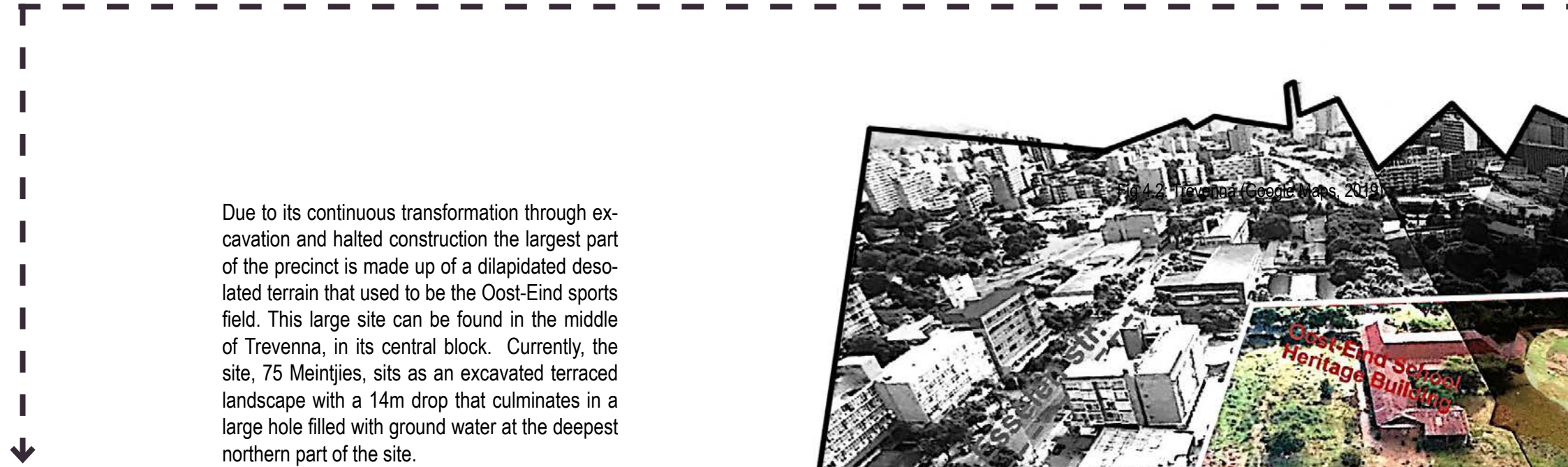


TREVENNA, TODAY

To find the most suitable site to achieve environmental regeneration and rehabilitation, various natural elements in the city were analysed and mapped such as water sources, rivers, excavations, mountains, ridges, open green spaces, post-industrial landscapes and most importantly latent urban voids. As a result, the most appropriate site found was 75 Meintjies street, Trevenna. The site, the old Pretoria Oost-Einde Primary School sport field, sits as a scarred landscape with a 14m deep large hole.

Fig 4.2: Trevenna (Google Maps, 2019 edited by Author).

TRANSFORMATION



Due to its continuous transformation through excavation and halted construction the largest part of the precinct is made up of a dilapidated desolated terrain that used to be the Oost-Eind sports field. This large site can be found in the middle of Trevenna, in its central block. Currently, the site, 75 Meintjies, sits as an excavated terraced landscape with a 14m drop that culminates in a large hole filled with ground water at the deepest northern part of the site.

During the basement construction of a major project builders hit a large amount of ground water at the northern end of the site. All parties could not find a feasible solution to remove the excessive amounts of water found on site and therefore halted any further construction, which gradually led to the abandonment of the project and a damaged landscape. Furthermore, there are physically remnants of rubble, pipes and steel and other left-over construction materials on the site. No record of this change of the site was kept.

THE SCARRED LANDSCAPE

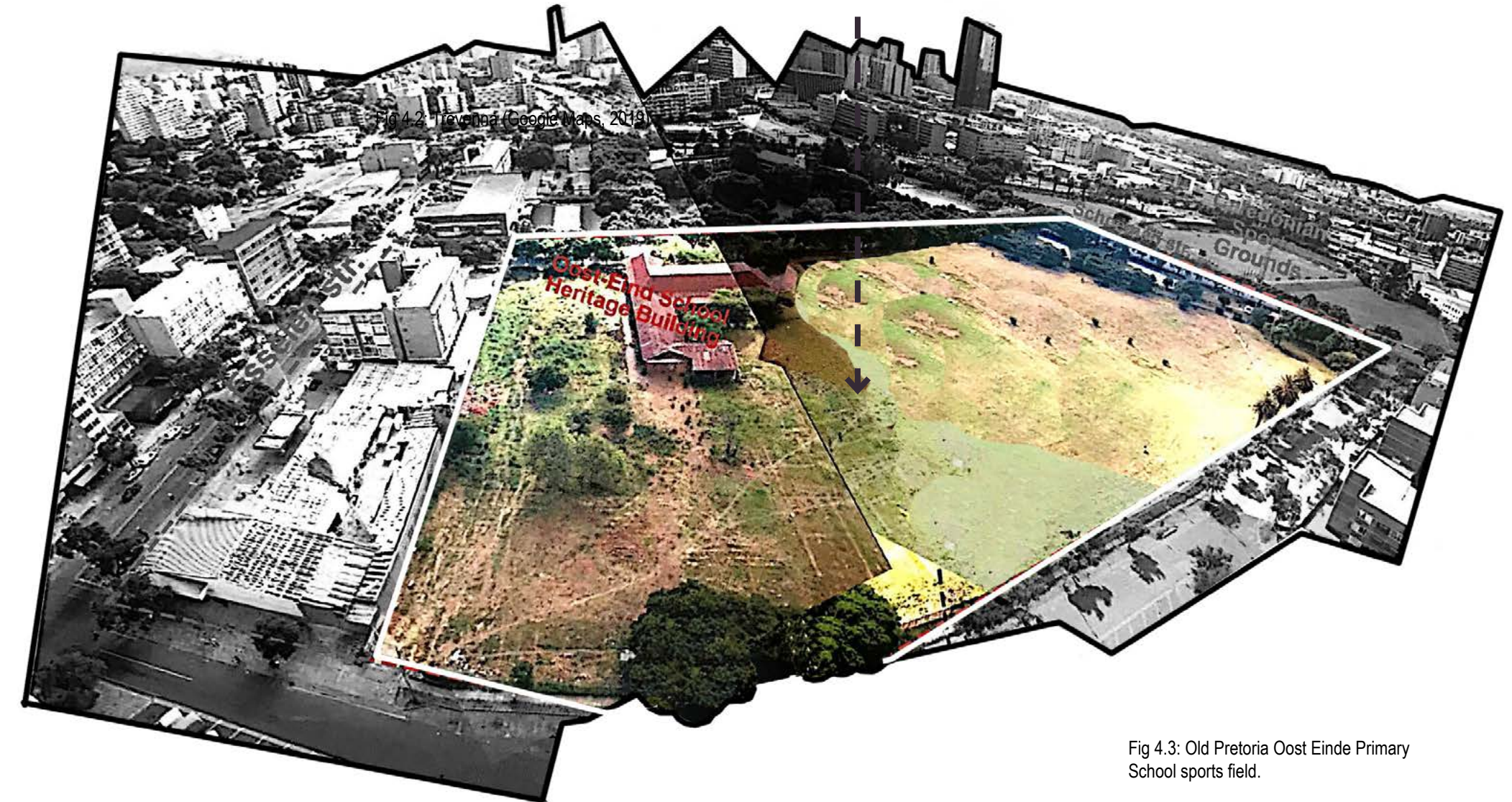


Fig 4.3: Old Pretoria Oost Einde Primary School sports field.



Proposed site in Trevenna

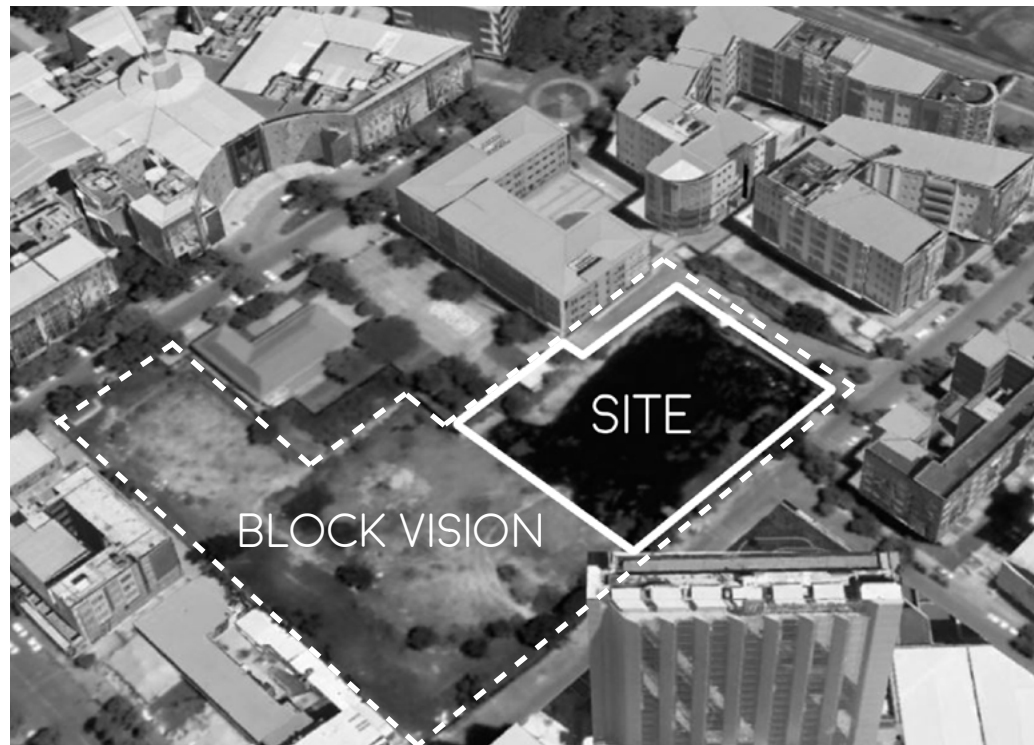


Fig 4.5: Aerial photograph of 75 Meintjies, in 2019 (Google Maps, edited by Author)



Fig 4.6: Aerial photograph of 75 Meintjies, in 2019 (Google Maps, edited by Author)



Over time, the landscape spontaneously (passively) started to repair itself; natural regeneration has occurred to the point where new ecological systems and biodiversity have grown and developed, simultaneously healing the landscape.

Fig 4.7: Photograph showing visible scarring on site as well as growth of natural vegetation.



Fig 4.8: Photograph showing the man-made wetland



Fig 4.9: Photograph showing the dissertation's chosen site.

SURROUNDING CONTEXT OF SITE.

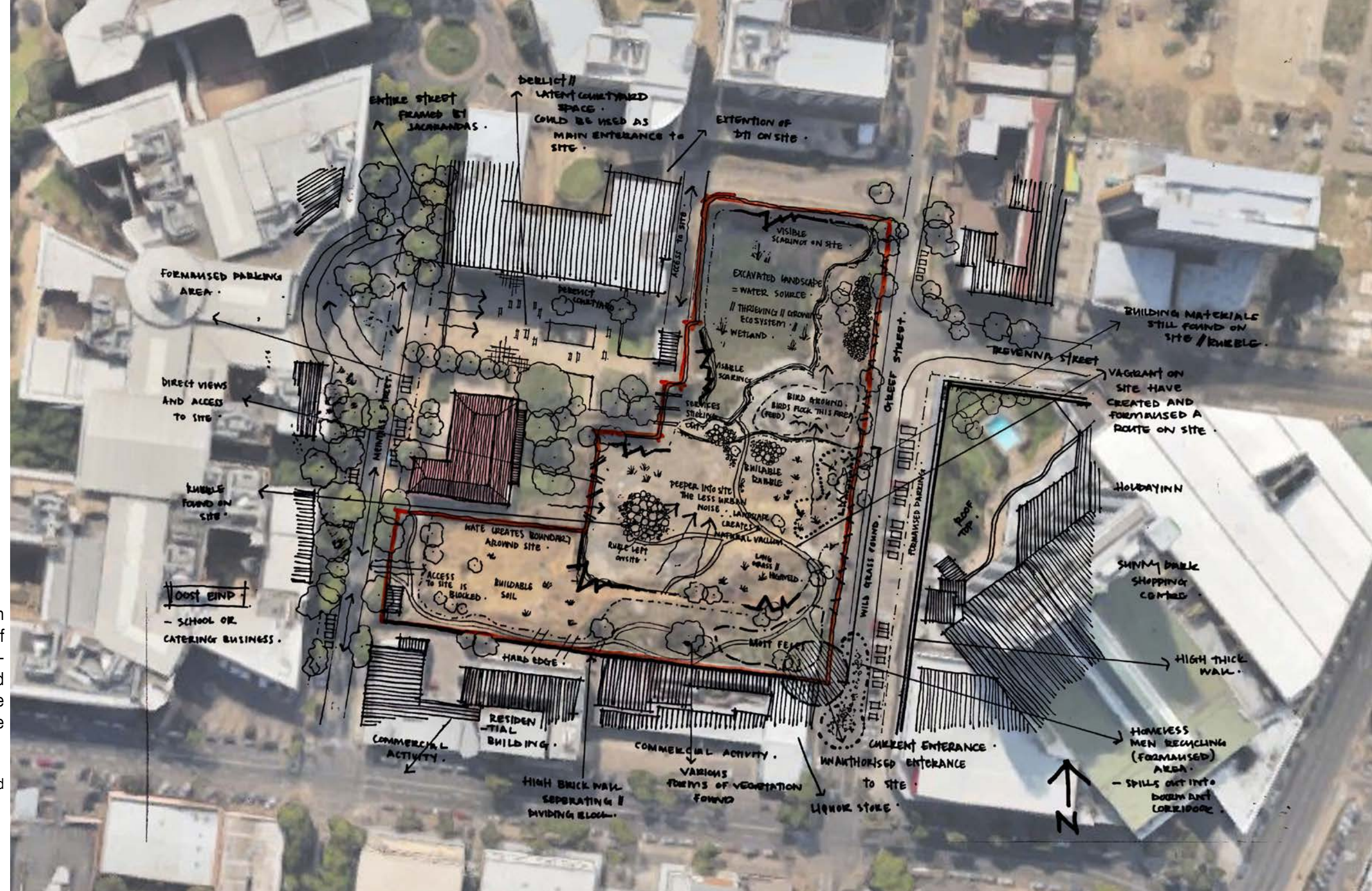
Fig 4.11: Photograph analysis of surrounding context of site



BLOCK VISION

Due to the large extent of the site, a block vision was done not only to ensure the remediation of the site but to control the programmatic intentions, needs and relationships of building and nature within the macro context to ensure the tangible and intangible integration of architecture and landscape.

Fig 4.12: Block Vision analysis (Google Maps 2019, edited by Author)



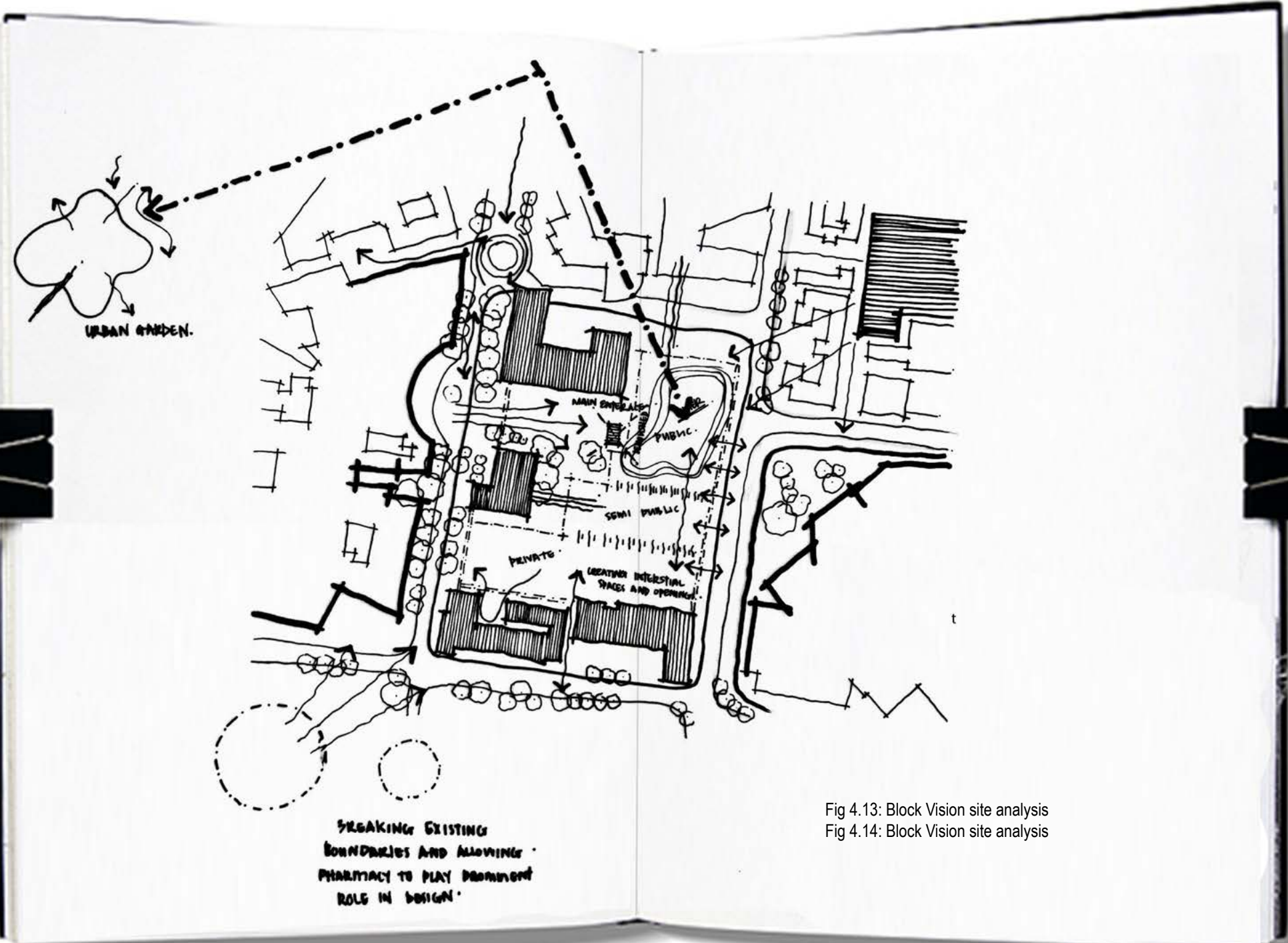
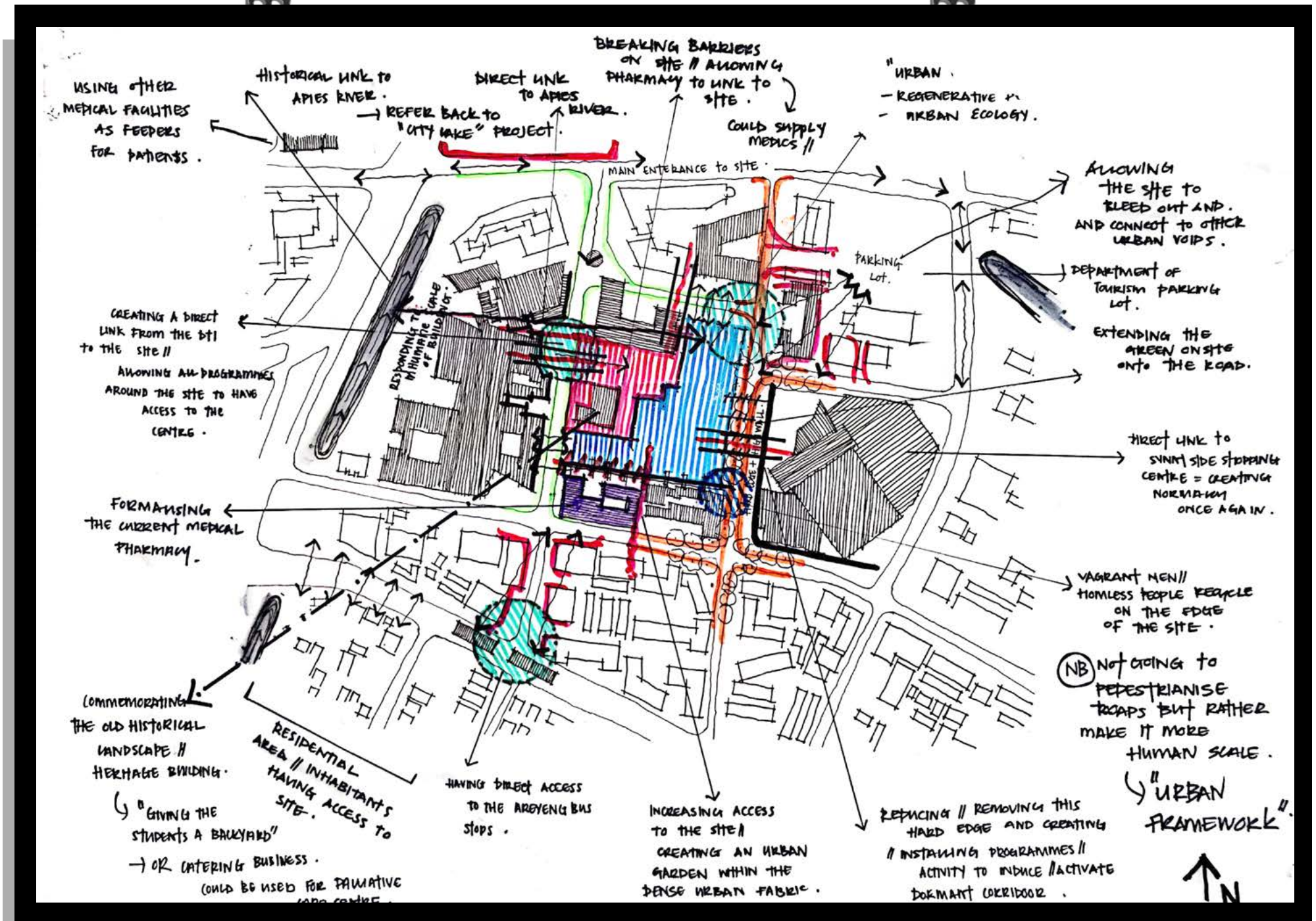


Fig 4.13: Block Vision site analysis
 Fig 4.14: Block Vision site analysis



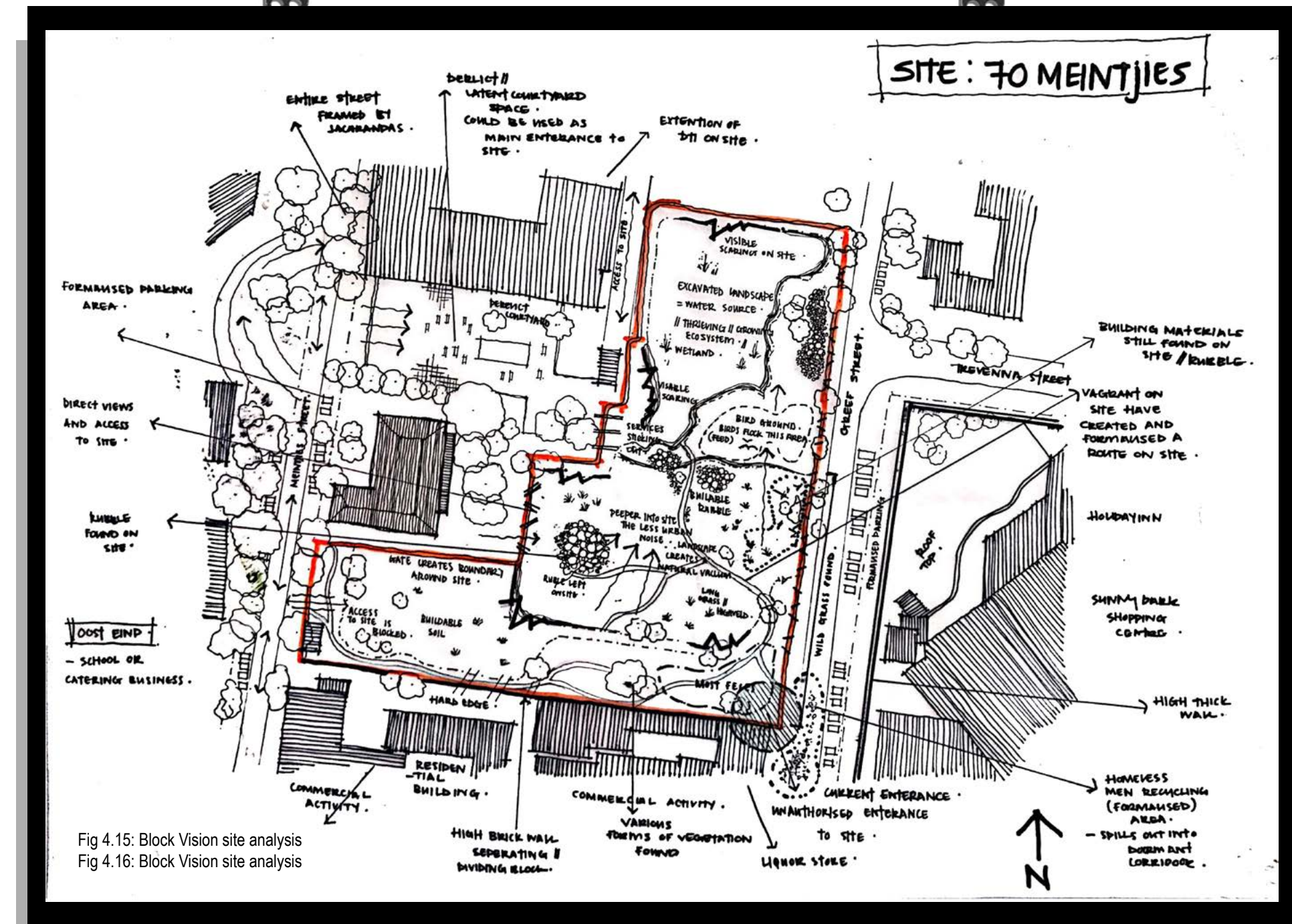
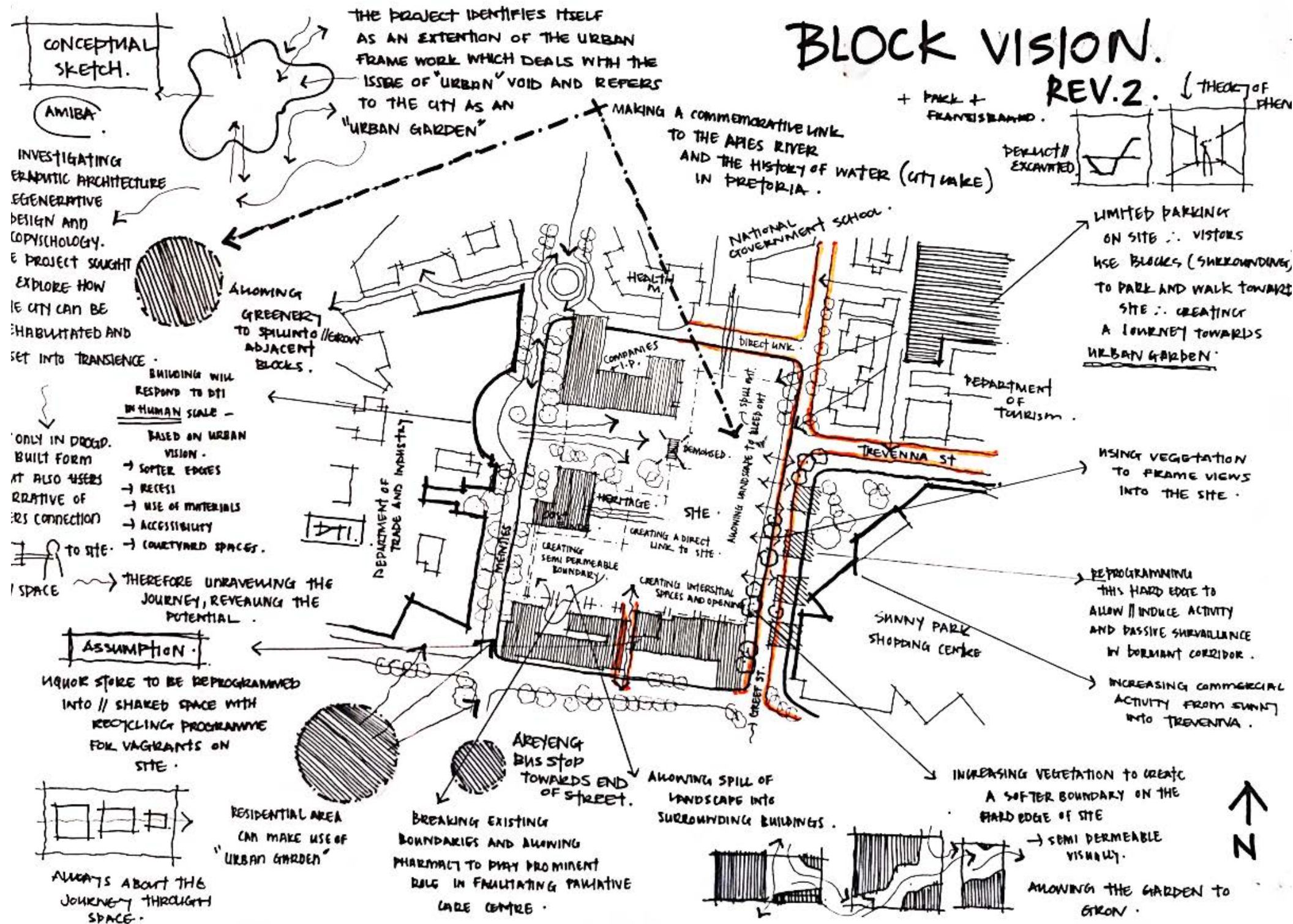


Fig 4.15: Block Vision site analysis
 Fig 4.16: Block Vision site analysis

75 MEINTJIES. TREVENNA THE URBAN GARDEN

The block vision identifies itself as an extension of the Urban Vision. Working with a derelict site ties into the larger Urban vision of the dissertation, extending the theory of Therapeutic Architecture into Ecopsychology and Regenerative Design, focusing on the rehabilitation of the poor ecological conditions found on the derelict and excavated site within the dense urban fabric.

Through this investigation, the block vision sought to explore how the site can be rehabilitated and set into transience not only in programme and built form, but specifically through the narration of the user's spatial connection with landscape in an attempt to repair the inherent detachment to the city's sense of place, therefore, unravelling the user's journey and revealing the potential mediation of the relationship between man, nature and architecture within the city.

The investigation simultaneously creates a parallel between the site and the programme users of an Urban Cancer Treatment Centre, therefore, allowing the site to become a patient.

Fig 4.17: Conceptual illustration of Urban Garden Block Vision



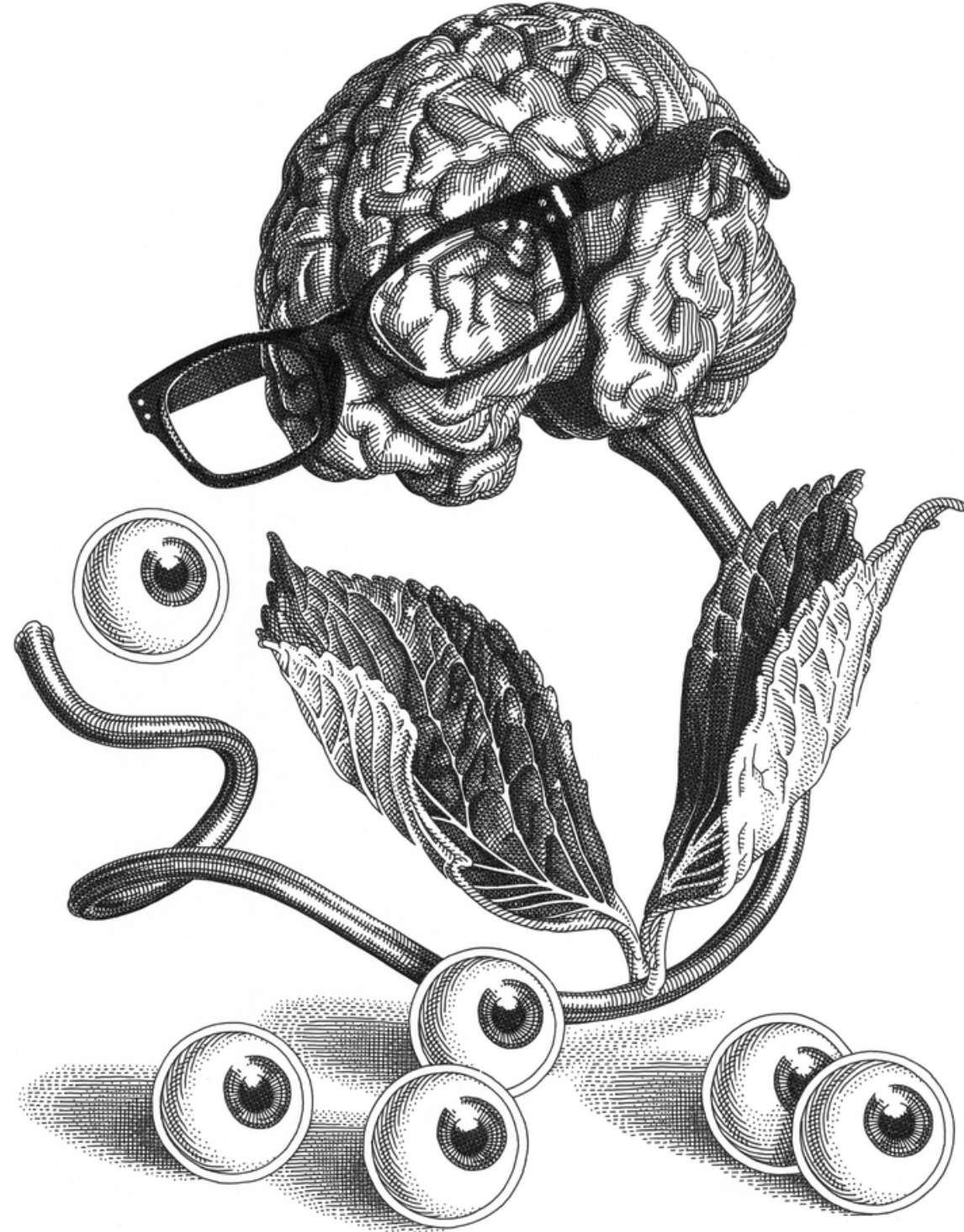


CHURCH
SQUARE

TREVENNA

05

Fig 5.1: "Looking Back" (Knaap, 2013)



04.

THEORETICAL APPROACH

This chapter introduces the theoretical framework that will align and support the argument of the dissertation. The theoretical approach aims to explore, understand and develop the healing qualities of nature and how it can be applied in the making of architecture to not only create an augmented therapeutic environment but also mediate the current gap between man and nature. Existing environmental and regenerative theories are examined, discussed and translated into a design framework that will inform the design informants of the project. Therapeutic Architecture serves as the overarching philosophy in which other theories, concepts and models are derived from and discussed.

HISTORY OF HEALING PLACE

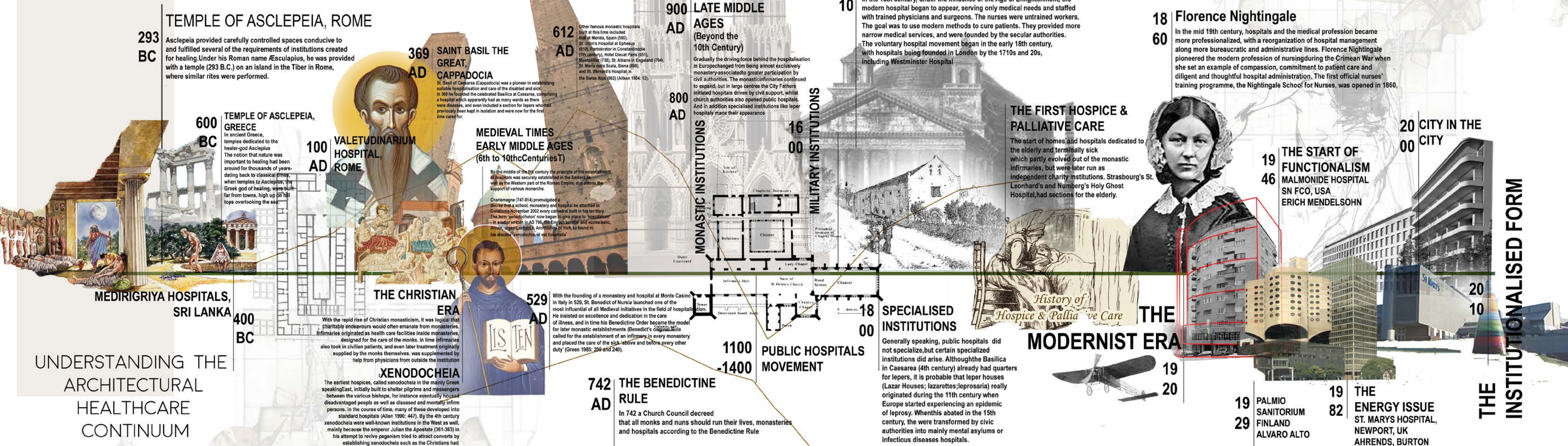


Fig 5.2: Healing of Healing Place

THE HISTORY OF HEALING ENVIRONMENTS

The notion that nature is important for healing had been around for thousands of years- dating back to classical times, when temples to Asclepius, the Greek god of healing, were built far from towns, high up on hill tops overlooking the sea. The Asclepius temples were distinctively and beautifully designed to immerse patients in nature, around animals, with art and music to restore their health, realign their mind, body and souls and showcase the healing qualities of the natural environment (Kreitzer et al., 2015).

In ancient cultures, religion and medicine were linked. An asclepeion was a healing temple found in Greece and Rome, sacred to the god Asclepius. The Greek healing cult of Asclepius, of great importance to the metaphysically minded, is worthy of most careful consideration. "The healing process was a mixture of religious ceremony and health practices — especially diet, water, herbs and exercise. In an asclepeion, treatments for the sick included mud baths, special diet, exercise, stress relief, and exposure to the sun" (Kreitzer et al., 2015). The healing process incorporated "sacred water" from a spring, the Archueoigicoi, which was regarded as the healing site of Epidaurus and was used for bathing Argolis, Greece.'

Fig 5.3: The heart of the Epidaurus sanctuary: the Tholos and the Abaton (left) and the Temple of Asclepius (center right) (Greece Is, 2019).



According to Elaine Lu "... the Asclepeions provided carefully controlled spaces conducive to healing and fulfilled several of the requirements of institutions created for healing.- The Asclepeion at Epidaurus was a classical prototype of such — within the place, there were bathing establishments, gymnasium, libraries, sleeping porches for guests, a theatre, and the temple proper. The composition of the healing place sheltered the Greek's health — not only their physical condition, but also their psychological and spiritual state"(Lu, 2014).

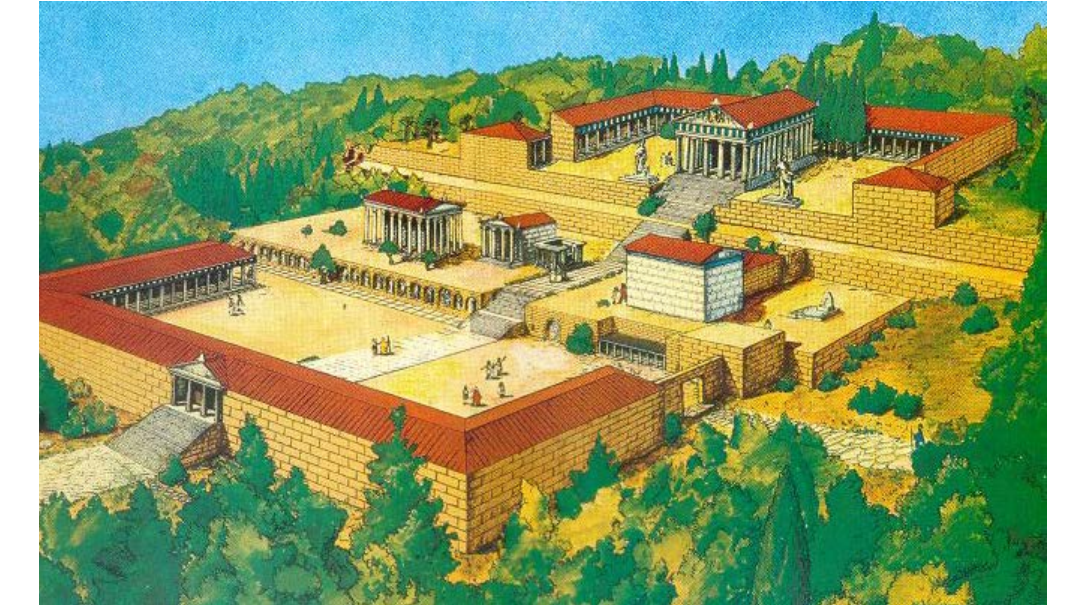


Fig 5.4: In ancient Greece and Rome, an asclepeion (Latin aesculapĭum) was a healing sanctuary sacred to Asclepius, the Greek god of medicine, where patients could come to be healed through spiritual or physical treatments (Ostia-antica.org, 2019).



Fig 5.5: Artistic reconstruction of the Asclepeion at Epidaurus (Ostia-antica.org, 2019).

- GUIDE**
- First Terrace (level)**
1. Entrance steps
 2. Propylaea (Gateway)
 3. Statues
 4. Roman buildings
 5. Arcades
 6. Rooms
 7. Vespasian (latrines)
 8. Wall with Recesses
 9. Second set of steps
- Second Terrace (level)**
10. Altar of Asclepius
 11. Temple of Apollo
 12. Chamber
 13. Platform
 14. Temple of Asclepius
 15. Priests' rooms
 16. Third set of steps
- Third terrace (level)**
17. Large Temple of Asclepius
 18. Arcades
 19. Patients' rooms

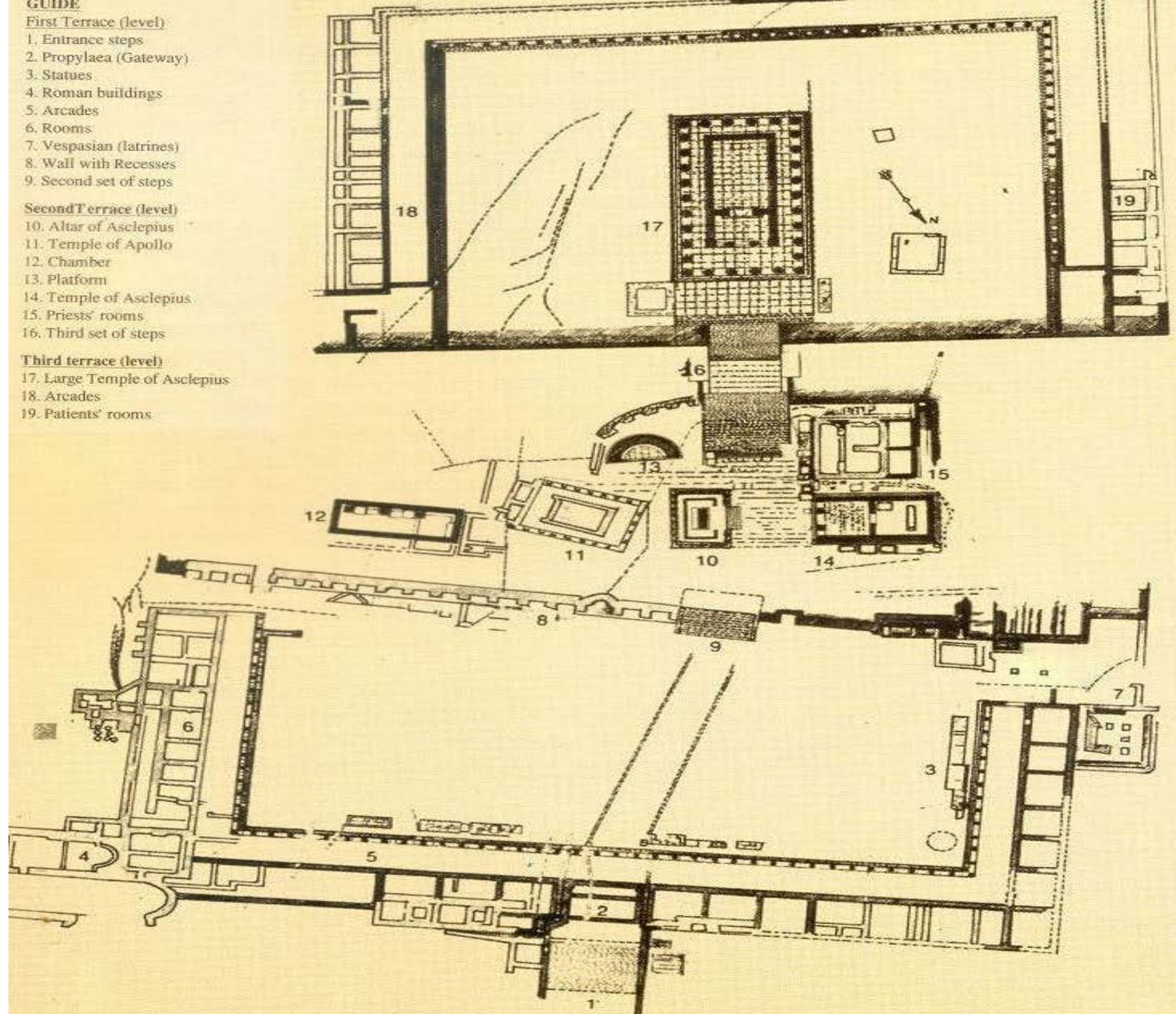


Fig 5.6: Plan of the Asklepieion (Ostia-antica.org, 2019).

THE MEDIEVAL CHRISTIAN ERA

During the medieval time, hospitals were greatly attached to monasteries. They were religious communities, with care provided by monks and nuns. The Hospital of St. John in Jerusalem reflected and elaborated on the values found in the earlier monastic history of Christian hospitals.

"The hospital, in which in various houses a great crowd of sick people is collected, some of them men and some women. They are cared for and every day fed at vast expense. When I was present, I learned from the servants that their whole number amounted to two thousand. Between night and day there were sometimes more than fifty corpses carried out, but again and again there were new people admitted, wrote the German pilgrim John of Wijnburg in about the year 1660, the house feeds so many individuals outside and within, and it gives so huge an amount of alms to poor people, either those who come to the door, or those who remain outside, that certainly the total expenses can in no way be counted, even by the managers and dispensers of this house.

- Description of the Holy Land by John of Urbure





19TH CENTURY

In the 19th century, Florence Nightingale, the world-renowned English social reformer and statistician and the founder of modern nursing, through her exploration of medical science, spoke of the importance of the natural qualities of nature, light, fresh air, touch, diet, noise control, and spirituality as the fundamental elements that contribute in the process of healing and the creation of therapeutic environments.

She emphasized that healthcare providers should, "...put the patient in the best possible condition so that nature can act, and healing occur" (Florence Nightingale, 1860, cited in Kreitzer et al., 2015).

The ancient practice of healing has become a revitalised concept that has been explored, understood and augmented through the light of modern science (Samueli Institute, 2011, p.7).

THE 20TH CENTURY SHIFT

During the minimalistic paradigm of the 20th century, in the quest to attain modern civilisa-

tion, man's ideals had shifted, and his dependent relationship to the natural environment was abandoned as human needs and desires dictated that modern man and his built environment were more important and more powerful than nature.

As man turned his back on the natural environment, unknowingly, he had compromised his very own existence and nature, his primary source of healing, had been affected too and started contributing in creating ailment for its inhabitants. This drastic disconnect with the natural environment had resulted in the rise of "diseases of affluence" (Murray 2005).

"Diseases of affluence" refers to chronic non-communicable diseases (NCDs) and other physical health conditions such as cancer, coronary heart disease, cerebrovascular disease, peripheral vascular disease, type 2 diabetes, and hypertension (Murray 2005).

By the 21st century, in search to find cures, the increase in technological advancements led to the rapid evolution of medical science and an institutional architecture where state-of the art healing environments such as hospitals, clinics, day care centres and hospices, were all designed to accommodate state of the art equipment, which led to a focus on functionality and rationality of form which has greatly affected patient recovery time which led to inhumane "healing" environments. The intent of healthcare facilities had changed and redirected towards the design of healing environments that focused on researching and attaining a body of knowledge

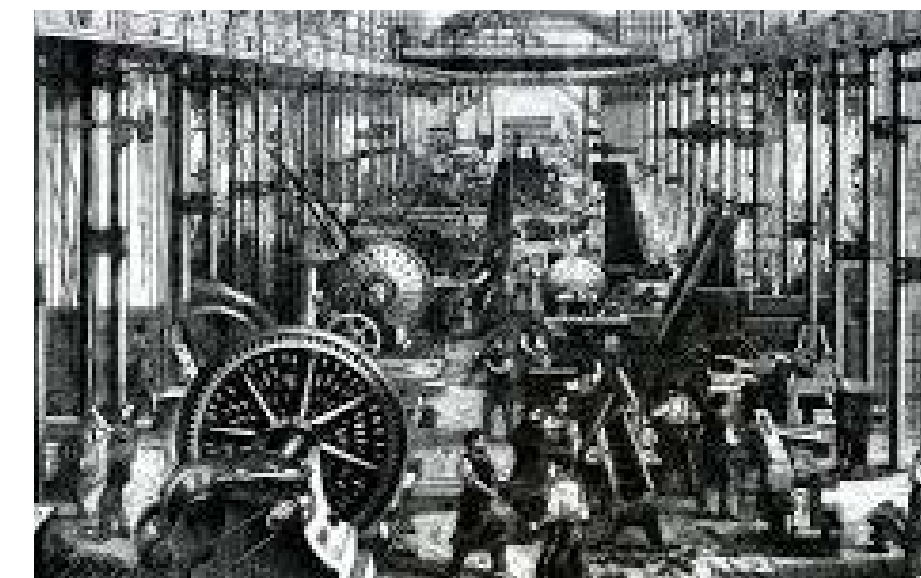
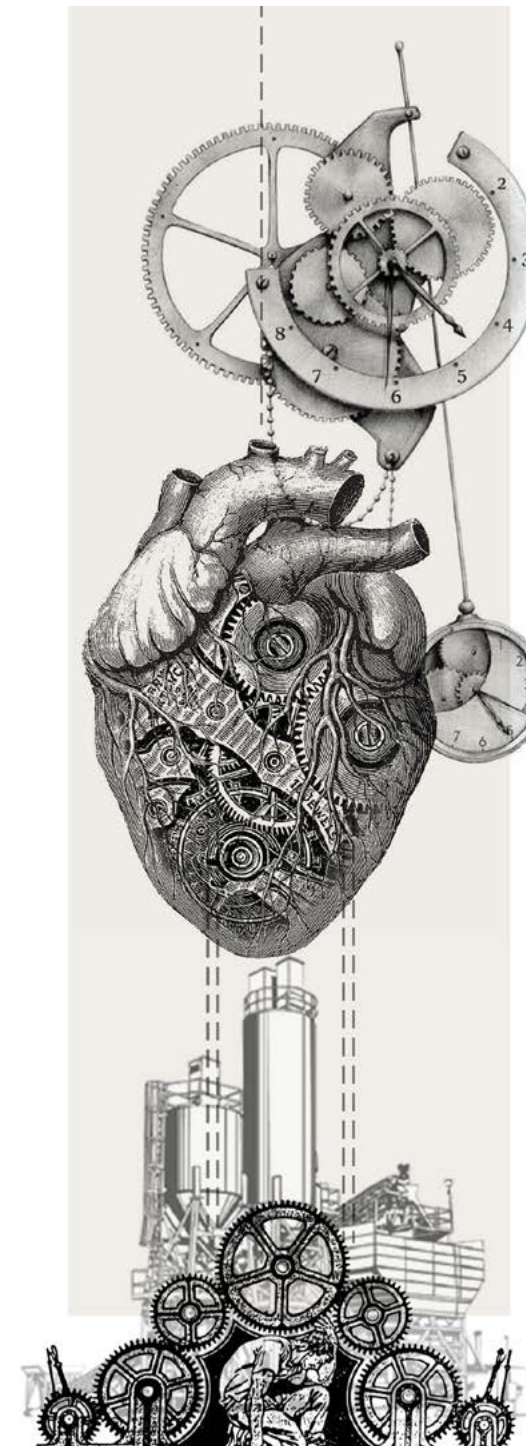


Fig 5.9: Industrial Revolution (Maschinenhalle, 1868)

that would not grow beyond the curing of illness and therefore excluded "full" patient recovery and overall wellness and well-being (Kreitzer et al., 2015).

There is a stark difference between the curing and healing process that patients go through. curing refers to the term "cure" used after medical treatment; the patient no longer has that particular condition or illness anymore. Whereas the term healing refers to the process of making the mind healthy again, in all aspects including mind body and soul (Samueli Institute, 2011, p.1.)

Fig 5.8: Conceptual illustration of Industrial Revolution

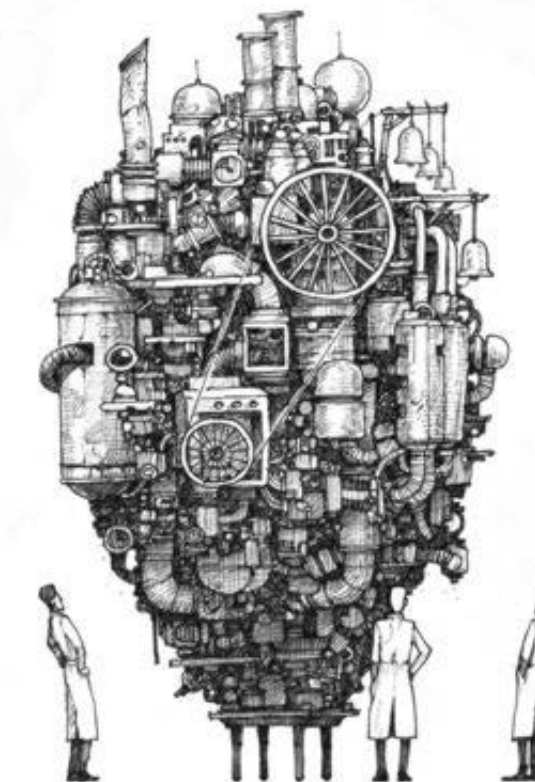


Fig 5.10: During the industrial revolution, man turned his back on the natural environment and put all his focus onto technology



Fig 5.11: Steve Biko Academic Hospital (Mediplanarch, 2019)

THE 21ST CENTURY TYPOLOGY

Existing South African medical facilities are synonymous with the prison system, in efficiency, form, function and by the way in which they isolate patients from public and external environment (Mashta, 2010).

This isolation interrupts rehabilitation as it delays recovery and consequently, patients become a replication of their environment. Roger Ulrich, a Professor at the Department of Architecture and Centre for Healthcare Architecture, Chalmers University of Technology, has explored the theory of Therapeutic Architecture and has argued that the physical and mental healing capabilities of a place, space and building determine their ability to effectively induce a healing environment.

Although rehabilitation facilities need administrative, safety and security measures, the negative therapeutic effects of such an environment can lead to slower recovery for patients and therefore should not outweigh the design intent of any medical typology. Several professionals including architects, therapists and sociologists, have contended the healing capacity of place and the physical qualities and abilities to encourage healing, through this growing significance and sense

of realisation has started to shift healthcare designs and mindsets to include a more sensitive approach to patients and reimplementing of humane healing process to create a Human-Centred Approach healthcare typology that would be essential for patients, their family, and staff that receive and give long or short term care, particularly to recuperate from exposure to social, physical and emotional volatility as a latent defect of any illness.

Healthcare providers, environmental psychologists and interior designers share This raises questions regarding so-called traditional, institutionally designed healthcare spaces, which express little empathy for the wellness of patients (Ulrich, 1992; Devlin & Arneill, 2003, p.665).

Samueli Institute further explains the definition of healing through the mission statement as

“..to transform health care through scientific exploration of wellness and whole-person healing” (Samueli Institute, 2011, p.1.).

Fig 5.12: Medical Ward, Louis Pasteur Private Hospital, Pretoria

Fig 5.13: Ward corridor, Netcare Pretoria East Hospital



A HUMAN-CENTRED APPROACH

The evident gap in the design of healthcare facilities has created an opportunity for a design typology with a more human centred approach that focuses on a holistic healing process where the human body is central to an experience that is medical, sensorial and spatial.

The approach conceptualises the ancient Greek healing process by implementing and combining the natural healing qualities of nature to the current institutional medical typology to create an effective and inductive healing environment the not only forces on the act of curing but overall wellness and well-being. It therefore becomes the responsibility and the power of the architecture itself to create a healthy environment that would impact a patient's health and recovery time.

For transformation to occur healing elements found in both the built and natural environment need to be identified to create and provide efficient and optimal healing environments (Schweitzer et al., 2004, p.71).

Environments impact health by influencing the behaviour and actions between, patients, their families and medical staff.

The idea that a building can induce healing derives from the concept of Therapeutic Architecture, which according to Evangelia Chrysikou, refers to "the people-centred, evidence-based discipline of the built environment, which aims to identify and support ways of incorporating those spatial elements that interact with people physiologically and psychologically into design" (Chrysikou, n.d.)

The concept does not suggest that architecture can heal, but rather through architectural manipulation and transformation of space designers can create multiple platforms for natural elements such as light, sound, colour, views, and textures to induce a healing environment that would in turn positively affect the physical and psychological well-being of people.

"Connection to the natural environment has been shown to improve overall healthcare quality in multiple ways by reducing staff stress and fatigue, increasing the effectiveness in delivering care, improving patient safety, and reducing patient stress. All this leads to improve health outcomes and patients who are happier and heal faster. Hospitals foster this by having views, natural light, and access to gardens or the outdoors."

- Whitney Hopkins (Hopkins, 2018)

HUMANISTIC APPROACH

Humanistic psychology is a psychological perspective that rose to prominence in the mid-20th century in answer to the limitations of Sigmund Freud's psychoanalytic theory

ANCIENT GREEK CONCEPT

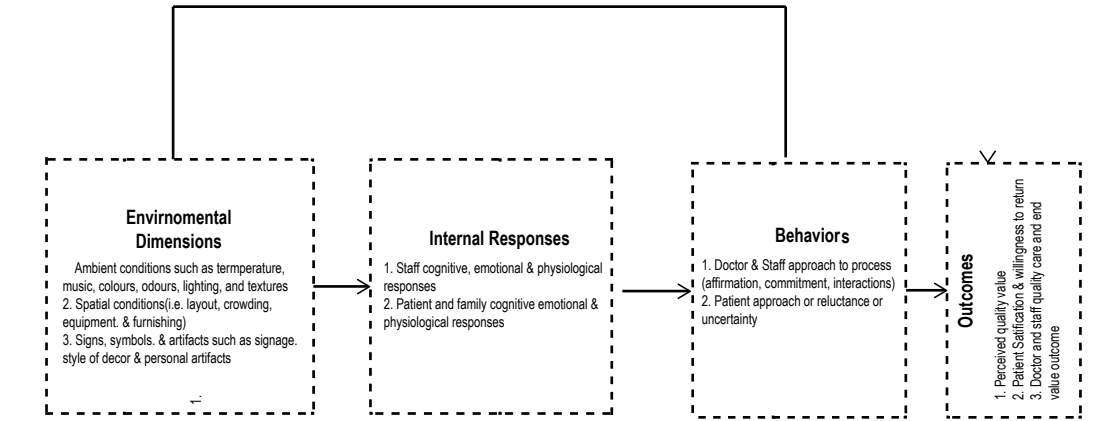
The Asclepius temples were uniquely designed to immerse patients in nature, music and art to restore their health, realign their mind, body and souls and showcase the healing qualities of the natural environment (Kreitzer et al., 2015).



HUMAN CENTRED APPROACH

Break down

Medical Sensorial Spatial



THERAPEUTIC ARCHITECTURE

Therapeutic Architecture combines the four principles of "green care" through evidence-based design approaches in in healthcare typologies to induce humanistic psychology and nature-based healing (FAQ,2019).



THERAPEUTIC ARCHITECTURE

Therapeutic Architecture combines the four principles of “green care” through evidence-based design approaches in healthcare typologies to induce humanistic psychology and nature-based healing (FAQ,2019). The applications and techniques of these principles are specifically incorporated in the designs of medical facilities and other alternative therapeutic programmes to address certain juvenile corrections and create an intense curative experience through the healing power of nature.

The 4 basic principles of Therapeutic Architecture applied in the design of healthcare typologies are;

1. Ecopsychology which refers to the immersion of patients in the natural environment for them to develop personally and improve their sense of well-being and create a sense of awareness of the mutual dependency that exists between man and nature
2. Biophilic Design involves the incorporation of the Evidence Based Design (EBD) therapeutic qualities of nature and use of the environment applied in the design of public buildings to improve health and well-being whilst benefitting the environment.

3. Phenomenology is an approach that suggests an environment can engage with the body’s sensory perceptions to invoke emotive qualities, thereby perceiving subliminal ‘truths’ – such as calm, stillness and rest – to the conscious and semi-conscious.

4. Regenerative Design involves the active the actual remediation of a scared landscape through Biomediation

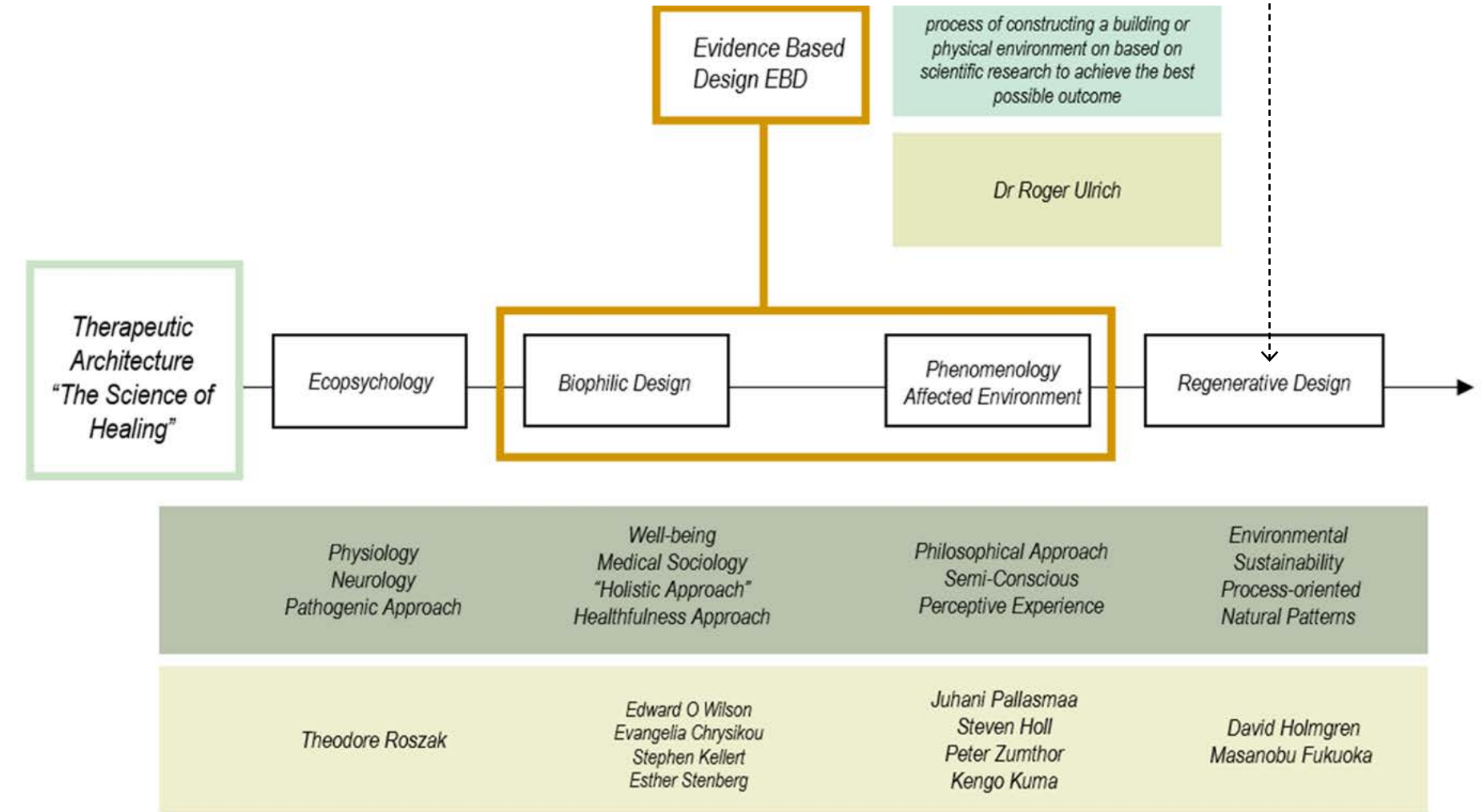
These concepts focus on the integration of the therapeutic qualities and sustainability precepts of nature in healthcare treatments and typologies, human-centred design, and the emotional sensorial experience, which will all be investigated to create a basis for the theoretical framework and play an integral part in design and form of the an Urban Cancer Treatment Facility. (Mazuch, 2017).

Due to the nature of the site and the large ground water body found on site, this essay specifically explores the water as a spatial and physical healer. The project aims to explore the natural and therapeutic qualities of water and how these qualities can then be interpreted spatially to create and facilitate a stimulating an alternative healing environment for cancer patients, family and staff in both public and private urban space while simultaneously inducing the remediation of a once scared landscape through regenerative

Fig 5.15: Therapeutic Architecture (Dezeen, 2004)



design. Therefore, Therapeutic Architecture is explored as the foundation for the nature-based transformative cancer treatment facility and how it’s incorporation and design in a clinical setting to induce a healing environment for its users while simultaneously repairing the broken link between man and nature. The theory will be explored and derived from the qualities of nature and reinterpreted into spatial forms that would contribute in producing an environment that encourages resilient health in the natural environment and its users, therefore shift the current condition from “humans versus nature” to “humans with nature” (Crous, 2016).



The diagram below explains the methodology of how these existing theories will be translated into a design framework that will serve as design informants at different scales

Fig 5.16: Therapeutic Architecture Applied Theories

THERAPEUTIC ARCHITECTURE

APPROPRIATE & APPLIED THEORIES

According to Evangelia Chrysikou, Therapeutic Architecture refers to "the people-centered, evidence-based discipline of the built environment, which aims to identify and support ways of incorporating those spatial elements that interact with people physiologically and psychologically into design" (Chrysikou, n.d.).

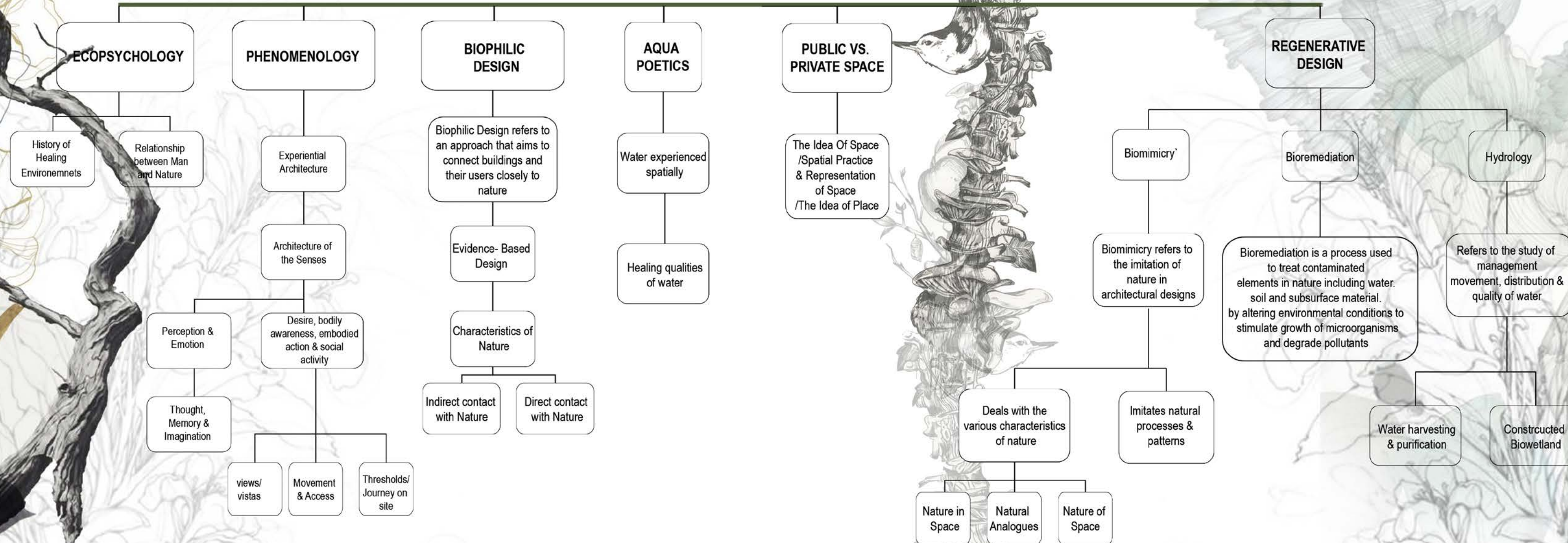


Fig 5.17: Therapeutic Architecture Applied Theories

AWAKENING THE ECOLOGICAL UNCONSCIOUS

In 1923, the cultural historian, Theodore Roszak first coined the term “Ecopsychology” and defined it as the innate connection that man has with nature (Roszak,1995). Roszak calls for a new synthesis of psychology, cosmology, and ecology as the cure for symptoms of modern man’s denial of his reliance to the natural environment and failure to take responsibility for the damage that his disconnect has caused, to initiate meaningful change.

Roszak’s theory came about through the ideas and combination of the emotional sensitivity of therapists with the scientific expertise of ecologists to create a new theoretical field that extends itself far beyond the idea of individual healing to include an extensive cultural scope that redefines and re-imagines society’s current broken relationship with mother nature (Roszak,1995). Ecopsychology seeks to explore this connection and restore the bond that has become increasing concern in urban environments.

This new social and intellectual movement strives to understand the idea of “ecological conscious” and harmonize people’s relationship with the nature through the examination of the eco-based psychology that has been integrated with psychological insights with the grassroots environmental to make an awareness of man’s current alienation and dependence on nature(Roszak,1995).

Ecopsychologists have integrated both ecology theories and practices to alter the current environmental action to adopt ecological thinking and exchange with the nature for psychotherapeutic purposes, individual healing and personal growth. Through Ecopsychology, users can form lifestyles that are ecologically sustainable and psychologically healthy (FAQ,2019).

The concept is broken down into 3 parts that all provide important insights into cognition, psychological well-being and an emphasis on the human experience. Firstly, there is the exploration of the deep connection with the inherent reciprocal relationship between humans and nature, this is best explained through the concepts of nature being both a home and family as well nature as the representation of the “collective self”. Secondly, it identifies the disconnect as a means of mutual suffering through environmental devastation and grief and alienation. Thirdly, reconnecting with nature encourages individual healing, psycho-emotional bonding, environmental action and sustainable lifestyles (FAQ,2019).

Through the immersion of patients in the natural environment, Ecopsychology promotes personal development, improves the sense of wellbeing and creates a sense of awareness of the mutual dependency that exists between man and nature. Through this application in the cancer care patients are naturally encouraged to make sustainable choices and lifestyles as they become aware of the importance of the intricate interconnection between human and environmental health.

Ecopsychology is a new field that aims to simultaneously heal the mind and surrounding environment. Initial studies suggest that access to green space and exercising in natural environments can induce these physical and psychological benefits (Roszak,1993).

“We need a new discipline that sees the needs of the planet and the person as a continuum and that can help us reconnect with the truth that lies in our communion with the rest of creation,”

Roszak writes in *The Voice of the Earth* (Simon and Schuster, 1995)

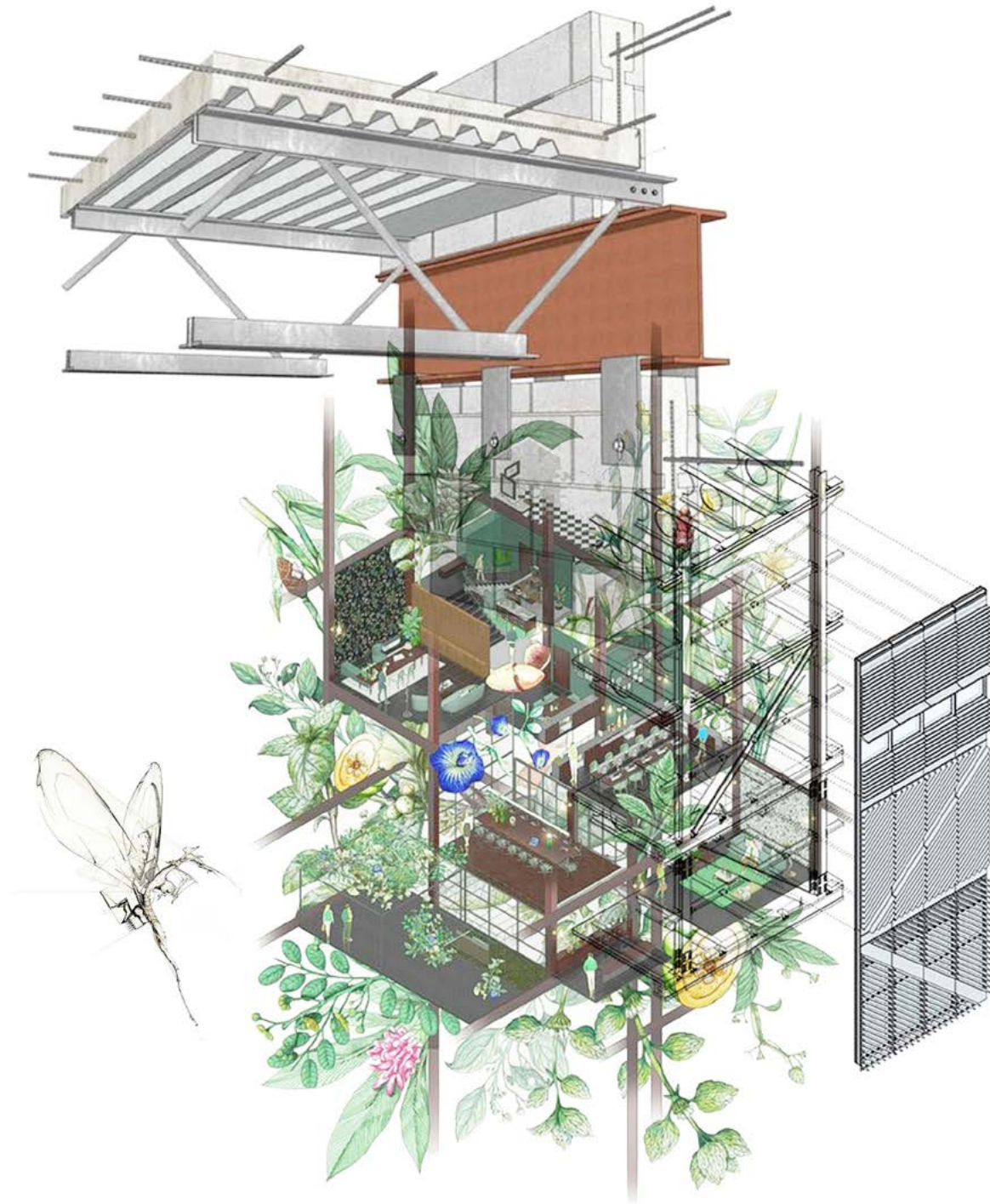
Fig 5.19: Awakening the Ecological Unconsciousness; Humans were born in nature, are bond by nature and should therefore return to nature (Vansadia, 2018).



Therapeutic Architecture Applied Theories

Fig 5.18: Awakening the Ecological Unconsciousness (Vansadia, 2018)





NATURE'S CURE: THE BIOPHILIC MODEL

Biophilia, like the theory of Ecopsychology, refers to the innate human attraction to nature and natural processes within it. Biophilia, "meaning love of nature" suggests that man's inherent connection to the natural world was built up through thousands of years of living in the agrarian settings.

The term "Biophilia" was coined by Edward O Wilson, an American biologist, in the 1980's, when he observed the increasing rates of urbanisation and how they were leading to a disconnection with the natural world. The importance of Biophilia has become directly proportional to this drastic increase in urbanisation in developing countries, and therefore has become an importance to our health and well-being in the built environment

In 2005 Stephen Kellert, a revered professor of social ecology at the Yale School of Forestry & Environmental who helped pioneer the theory of "biophilia", noted that there are 70 tangible characteristics of biophilic design that can be applied to the built environment to create a simulating healing setting (Kellen 2008: 21-31).

Fig 5.20: Nature's Biophilic Model; the combination of architecture and landscape

These principles are further divided into two biophilic dimensions, the 1. Organic or Naturalistic dimension and a Place-based or Vernacular dimension (Kellert 2008: 4).

1. The Organic or Naturalistic dimension is defined as "shapes and forms in the built environment that directly, indirectly or symbolically reflect the human affinity for nature" (Kellert 2008: 4).

2. The Place-based or Vernacular dimension refers to buildings and landscapes that connect to the culture and ecology of a locality or geographic area. Wendell Berry (1972: 68) remarked: "without a complex knowledge of one's place on which such knowledge depends. it is inevitable that the place will be used carelessly and eventually destroyed".

The user's inherent attachment to the sense place of a space is responsible for the how the take care of their surroundings, for the maintenance and preservation of the architecture of a building or different landscape. However, their disconnect has resulted in the discarded buildings, latent landscapes and a detached sense of place, a prominent characteristic in the 21st century modern society (Kellen 2008: 6).

This EBD approach make both patient and environment observational studies to determine environmental factors that may be supportive of healing. Discussions or findings are subject to a process of peer-review and macro studies to generate a central repository that serves as a basis for informing future architectural design.

Biophilic Design uses EBD to explore the many ways in which nature can contribute to health and well-being. Nature's inherent beauty can solely induce stress relief, improve moods, mental restoration and create a relaxation environment. Dr Roger Ulrich, a Professor of Architecture at the Centre for Healthcare Building Research at Chalmers University of Technology in Sweden, is well-known for his work in therapeutic architecture and his exploration in evidence-based healthcare design.

Through extensive research and practical experiments with patients, the professor theorised and revealed the ‘power of the window’ through a science experiment that confirmed that patients in hospital recovered faster when their rooms had a direct view of the external natural environment rather than a blank wall (Ulrich,1991).

“A window is not seen merely as a functional necessity that provides light and ventilation, but also a gateway that has the ability to transport a patient from a harsh reality to a place of contemplation, serving as a temporary escape.11 Society has begun to favour nature as a result of our association with nature as a restorative experience, while we associate our everyday urban settings with traffic, frustration, congestion, stress, crime, and pollution, which result in our psychological desire to escape it.”(Ruga,1989).

Ulrich further introduced the concept of “framing views” through the experiment and observation of engaging patients with specific natural elements such as water features, flowers and trees in the landscape which encouraged a moment of self-awareness, which served as distraction from pain and suffering (Basson, 2014).

The idea also produced environments that induced comfort and relaxation, which increased patient recovery time by creating a perceptive environment that would allow patients to experience the external world rather than being viewed and assisted by others, therefore, moving away from

the sterile design and poor qualities of medical institutionalisation (Ulrich,1991).

Dr Roger Ulrich suggests that there are four possible reasons for the positives effects that nature has on humans (Ulrich,1991):

1. The association with nature through physical activity evidentially stimulates positive health.
2. Socializing is directly linked with nature, this is done by doing mundane activities while being immersed in nature, like walking, socialising with a friend or sitting on a bench in a park.
3. Nature inherently provides a temporary escape from the realities of everyday life.
4. Nature itself has a powerful influence on the mind.

Other experimental findings in EBD include the use of effective ventilation systems with reduced infection transmission: the incorporation of sound-absorbing floor coverings with the improvement of sleep quality and the preference for controlled sunlight access for better pain and sleep management.

Fig 5.24: Biophilic Design (Crous, 2017)

CURRENT BIOPHILIC DESIGN MODELS

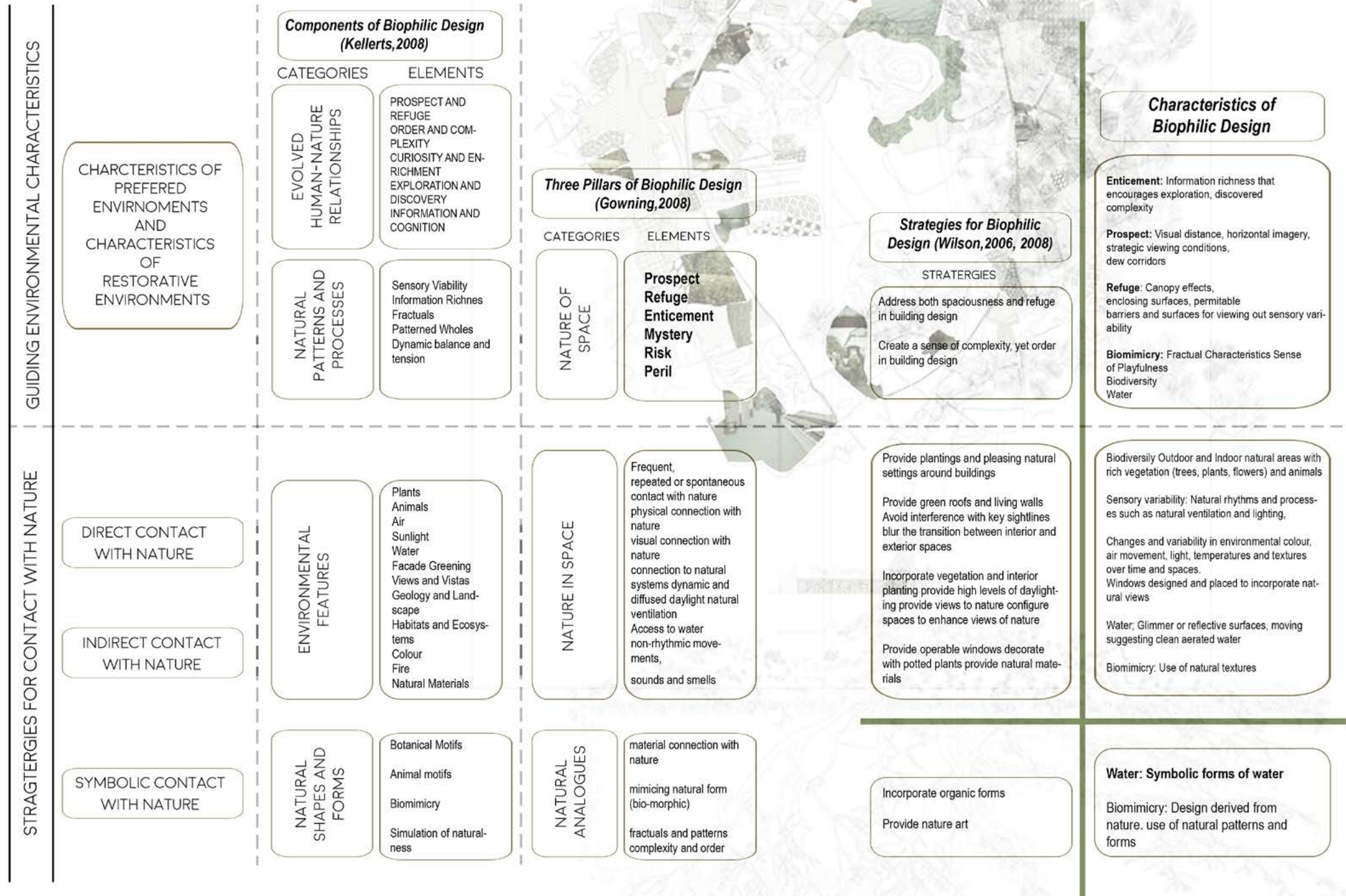




Fig 5.21: Poorly designed ICU Ward, Louis Pasteur Private Hospital, Pretoria

Fig 5.22: The new patient room design for the Cleveland Clinic Foundation's Avon Hospital focused on improving the patient experience by emphasizing safety, leveraging technology and shortening length of stay (Reeves, 2017)



These two dimensions of biophilic design are then further explored with each having several attributes, as indicated in Fig 5.23

The six biophilic design elements are further elaborated and applied through the principles of Evidence Based Design to create a human centred approach that is applied to enhance the spatial experience of form with numerous benefits to our health and well-being (Keller 2008: 6).

Evidence-Based Design (EBD) is the rational approach to biophilic design that applies scientific observations to design principles.

Established by Professor Archie Cochrane as a derivative of evidence-based medicine, this approach can be defined as the therapeutic design decisions based on the best available information from credible research and evaluation of existing projects (Stankos and Schwarz, 2014).

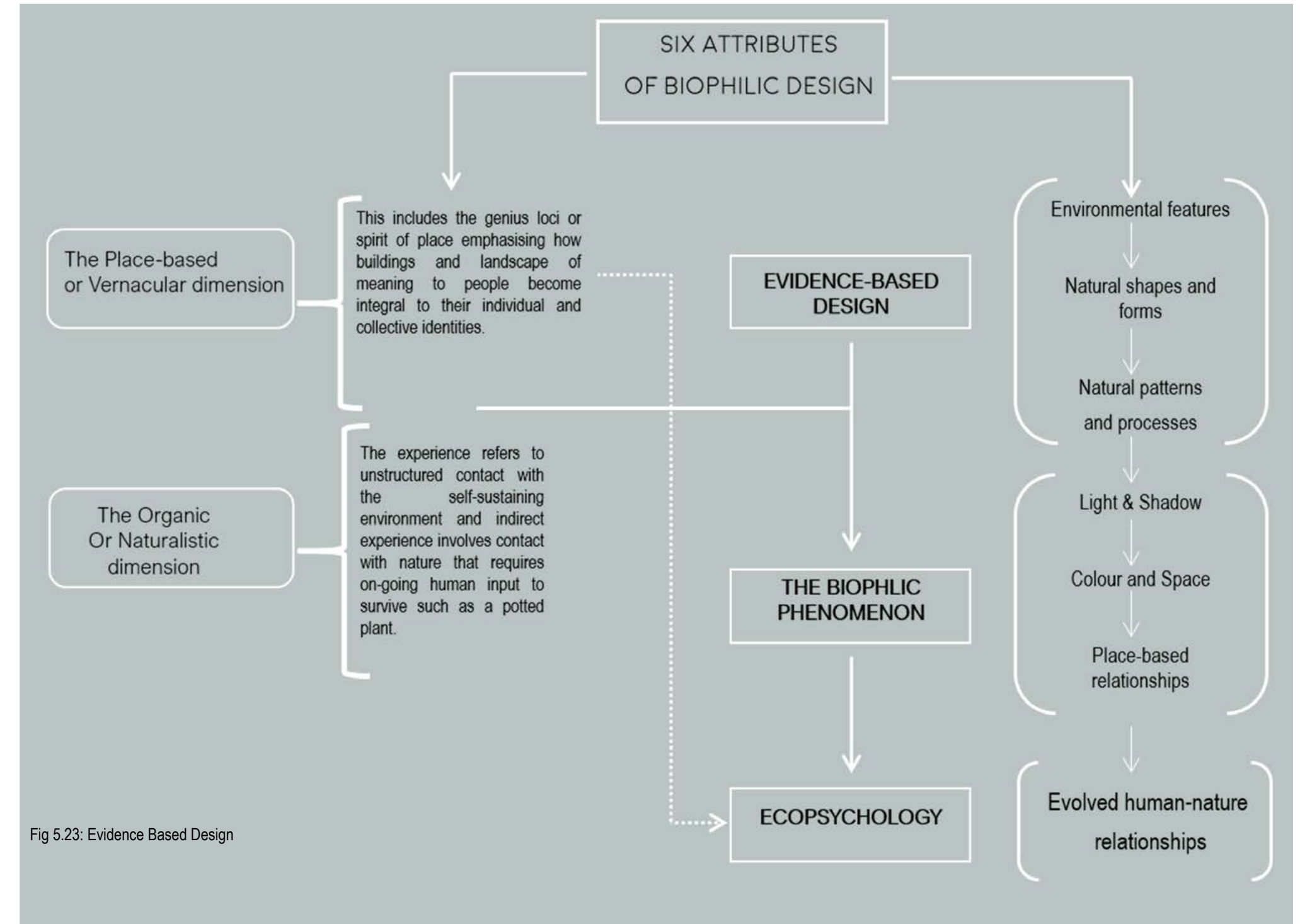


Fig 5.23: Evidence Based Design



PRECEDENT:

THE MAGGIE CENTER

Inspired by biophilic design and evidence-based design the fosters + partner” Maggie Centre scheme is designed in a beautiful serene landscape garden with the intent too create a domestic environment.

Internally, the scheme combines a variety of spaces, from intimate private niches to a library, exercise rooms and places to gather. consistent to every Maggie’s centre, at the heart of the building is the kitchen, which is centred on a large, communal table. meanwhile, the support offices are located on a mezzanine level positioned on top of a wide central spine, with toilets and storage spaces below, maintaining natural visual connections across the building

Throughout the space, there is a constant focus on capitalizing natural light, greenery and views of the garden outside

Each treatment and counselling room orientated on the eastern façade faces its own private garden. the south end of the building extends to embrace a greenhouse – a celebration of light and nature – which provides a garden retreat, a space for people to gather, to work with their hands and enjoy the therapeutic qualities of nature and the outdoors

Fig 5.25-29: Biophilic Design (foster + partner, 2016)

THE MANIPULATION OF PHENOMENA AND SYSTEMS

Phenomenology, a branch of philosophy, is another field that has lent itself to the area of therapeutic architecture. Defined broadly as the “study of structure of experience or consciousness” (Stanford Encyclopaedia of Philosophy), contemporary architectural phenomenology suggests the opportunity of designing for the spatial experience. This approach posits an environment can engage with the body’s innate sensory needs to invoke emotive qualities, thereby conveying subliminal ‘truths’ – such as calm, stillness and rest – to the semi-conscious (Lee, 2015).

Phenomenologist, Finnish architect and former professor of architecture and dean at the Helsinki University of Technology, Juhani Pallasmaa, “attributes the pathology of everyday architecture to “the negligence of the body and the sense” (Pallasmaa, 2011) arguing that the lack of a multi-sensorial spatial experience leads to “a [de]strengthened [sense] of self” (Pallasmaa, 2011).

Pallasmaa further explains the integral and directly proportional relationship between our natural

surroundings and sensory perception by stating that they have a direct effect on our emotions and reactions, and therefore essentially contribute to the process of healing within a space.

In his book, “The Eyes of the Skin”, Pallasmaa explains how;

“all the senses, including vision, are extensions of the tactile sense; the senses are specializations of skin tissue and all sensory experiences are modes of touching and thus related to tactility. Our contact with the world takes place at the boundary line of the self, through specialized parts of our enveloping membrane” (Pallasmaa, 2005:12)

By means of the senses, namely touch, sound, smell, sight, the Finnish architect describes how in the absence of the human senses, has greatly affected and contributed in the creation of our impoverished environments, whether it be room, building, landscape or urban city, this absence has consequently created a sense of dispassion and hostility. He states that:

“The very essence of the lived experience is moulded by hapticity and peripheral unfocused vision. Focused vision confronts us with the world, whereas peripheral vision envelops us in

the flesh of the world” (Pallasmaa, 2005:12)
This suggests that the process of healing is not linear and occurs through specific molecules of the brain that are in control of articulating our internal auditory perception, through the combination of various signal that allow the five senses of the body to perceive its direct surrounding environment.

The body’s emotional response to its surrounding unconsciously stimulates the immune system which fundamentally induces healing (Barbara, et al. 2013). According to Esther M. Sternberg’s book “Healing Spaces: The Science of Place and Well-Being”, the body’s cognitive awareness is made up of chemicals and nerves that regulate and all experienced moods while simultaneously receiving the information through the senses to create an image of the perceived and experienced idea of place (Sternberg, 2010).

The change in mood and improvement of well-being is an unconscious consequence of the perceived sense of place; as an environment changes, so does the emotive response of the body to it.

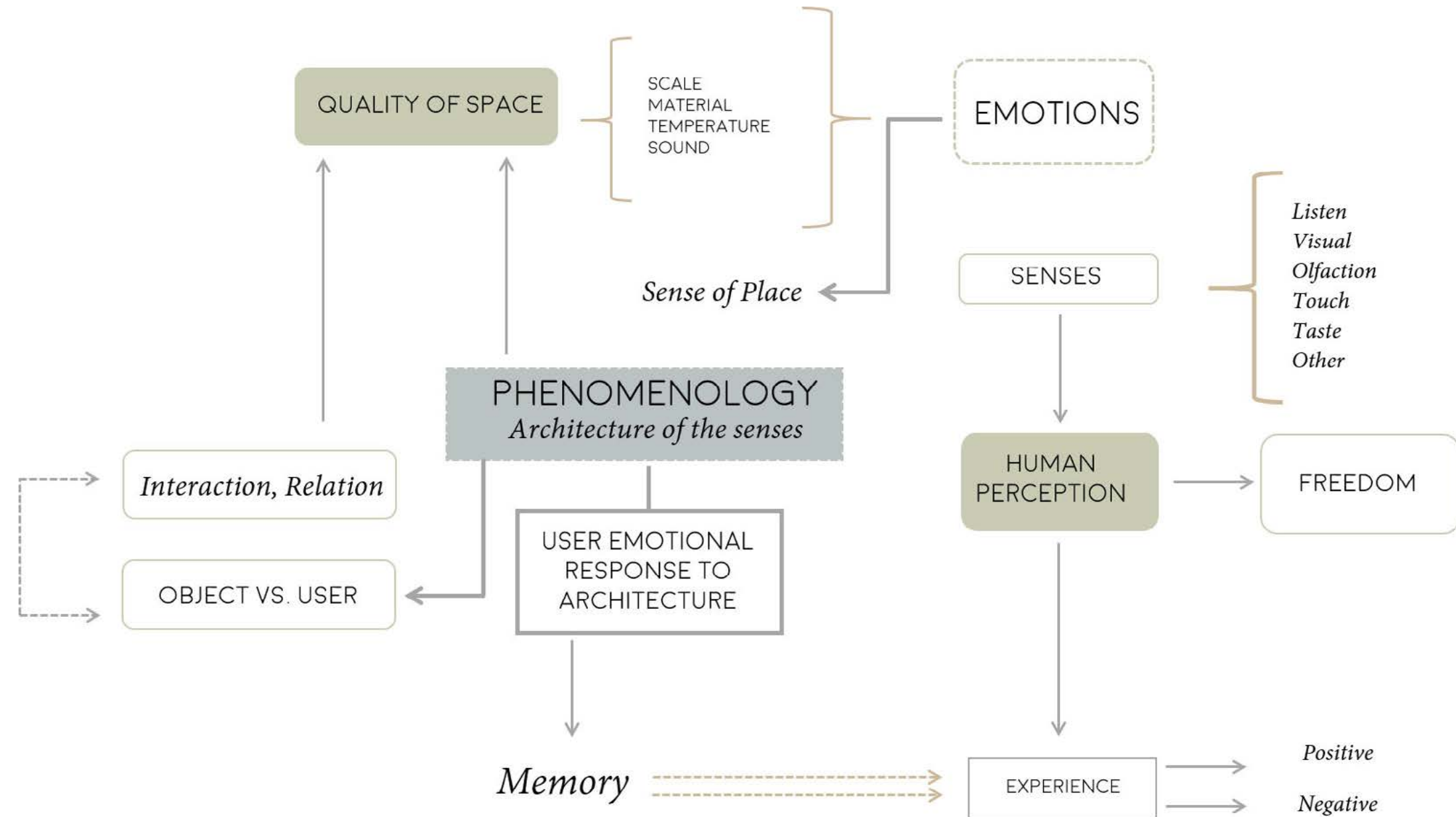


Fig 5.30: Phenomenology Breakdown

Our human senses can be perceived as the portal linking our emotions with our perceived reality.

Therefore, the architecture of a hydrotherapy cancer treatment facility can act as a catalyst for connection and be described as the tailor of our sensory perception, a portal linking form, space and the sensual experience to either deprive or stimulate all the human senses in order to ultimately formulate an intense healing experience.

Fig 14: Illustration of the different ranges of the senses that can be enhanced through spatial exploration, design (Malnar & Vodvarka 2004),

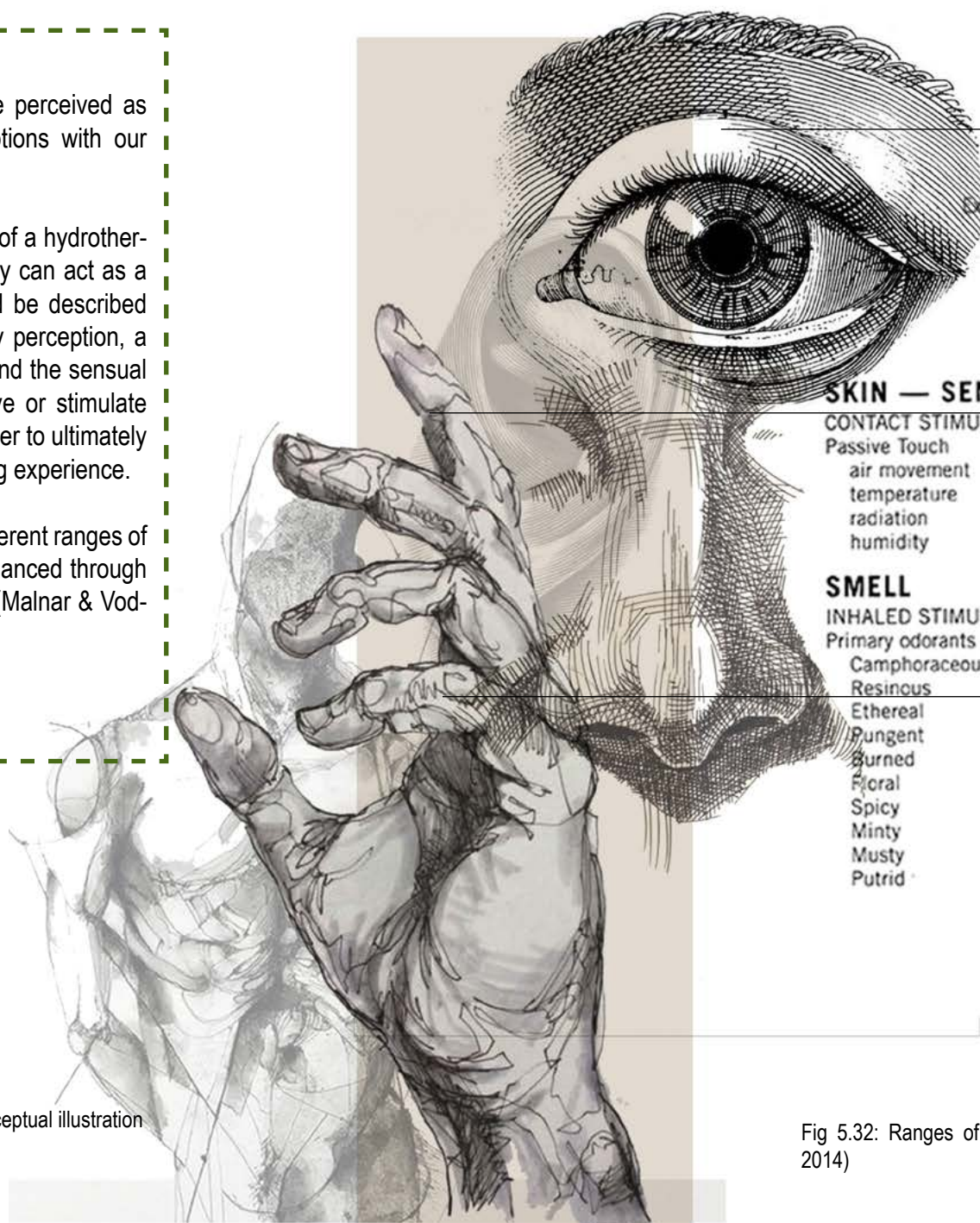


Fig 5.31: Phenomenology conceptual illustration

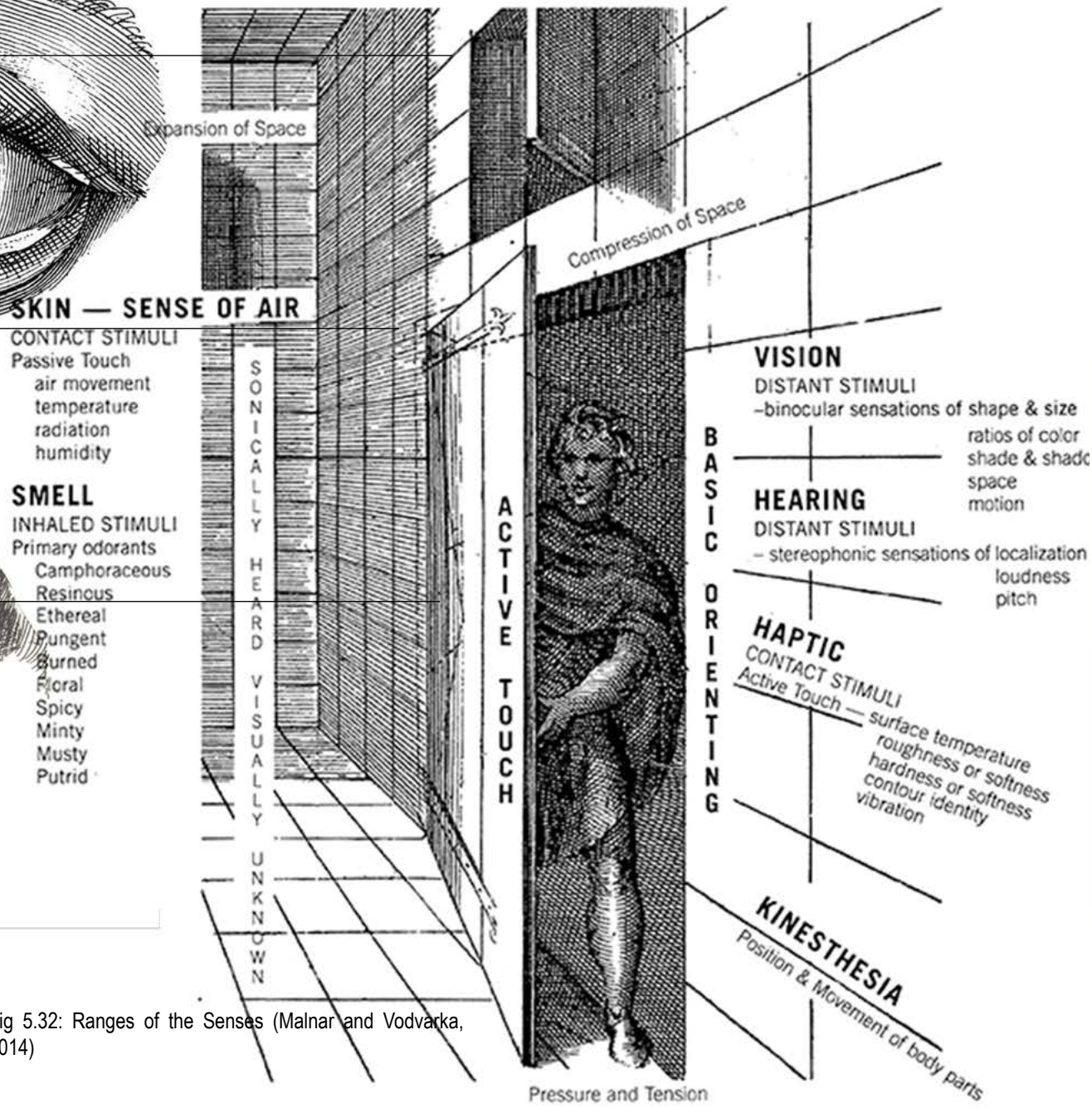


Fig 5.32: Ranges of the Senses (Malnar and Vodvarka, 2014)

An environment that is numbing to the senses is one of the negative aspects associated with healthcare environments. Conversely, hospitals are also capable of causing a sensory overload (Baker, 1984). It has been suggested that some care units may be hazardous to health due to the feelin anxiety they create.

- Four variables that affect patients negatively are identified as
1. Lighting that alters circadian rhythms
 2. Perception of crowding brought on by the presence of unfamiliar people
 3. Unwelcomed odors and sensations
 4. Noise from various sources

The above affects can create a numbing effect that may lead to sensory overload. Therefore, it is important to note and reconsider all features of the senses when designing healthcare environments

NOISE

The design of acoustics in the healthcare environment plays an integral role in the safety, health, healing and well-being of all patients, family, staff and doctors. Maintaining a level of speech privacy in hospital settings, has proved to reduce medical errors through the support of open conversations among patients, families and staff, which directly affects patient satisfaction and well-being (Ceilings & Interior Systems Construction Association, 2010, p.5).

AROMA

Studies have shown that pleasing smells, or aromas can reduce high blood pressure, slow respiration rates, and lower pain perception levels. Further studies indicate that fragrances lowered patient anxiety during magnetic resonance imaging.

It is important to note that the elimination of odours (bad smells) have been observed to stimulate anxiety, fear and stress. This is achieved through successful spatial programming, ventilation and hygiene.

TEMPERATURE & VENTILATION

Numerous claims have been made regarding the health benefits of fresh air. The energy efficiency and sustainable design ("green architecture") of a building can improve natural ventilation. Thus the energy efficiency of a building is increased and indoor environmental conditions are improved. Indoor air pollutants can cause eye, nose and throat irritation; headaches; loss of co-ordination; nausea; cancer; and damage to the liver, kidneys and central nervous system.

3 PROPERTIES
 ADDRESSED IN THE
 DESIGN OF HEALTH-
 CARE FACILITIES

1. Sound pressure
2. Background noise
3. Reverberation

NEGATIVE IMPACT OF NOISE (UNWANTED SOUND)

ACOUSTICS IMPACT BOTH
 THE PHYSIOLOGICAL AND
 PSYCHOLOGICAL WELL-BE-
 ING OF PATIENTS

SPEECH INTELLIGIBILITY

Speech intelligibility is an important safety concern to staff in healthcare environments. Staff must be able to understand and respond to many types of auditory signals. If speech intelligibility is not fully addressed, it may negatively impact patient care and safety. Sudden noises cause "startle reflexes", which lead to higher blood pressure and respiratory rates in patients. Prolonged exposure to excessive noise levels may lead to: memory problems, irritation, impaired pain tolerance and perceptions of isolation. It leads to sleep disruption and deprivation. (Ceilings & Interior Systems Construction Association, 2010, p.5)

PATIENT PRIVACY & COMFORT

Impacts both patients, families, staff and doctors; safety, privacy, perception and comfort

NOISE AROMA TEMPERATURE & VENTILATION

Fig 5.33: Ranges of the Senses break down (Author, 2019).

ARCHITECTURE AND THE SENSES: PHENOMENOLOGY OF SPATIAL PERCEPTION

Juhani Pallasmaa (2005:328) defines phenomenology as:
"Architecture is the art of reconciliation between us and the world, and this mediation takes place through the senses".

Designers should recognise architecture's purpose to transform a site into a place; a place that captures the character not only of its surroundings but also of its people.

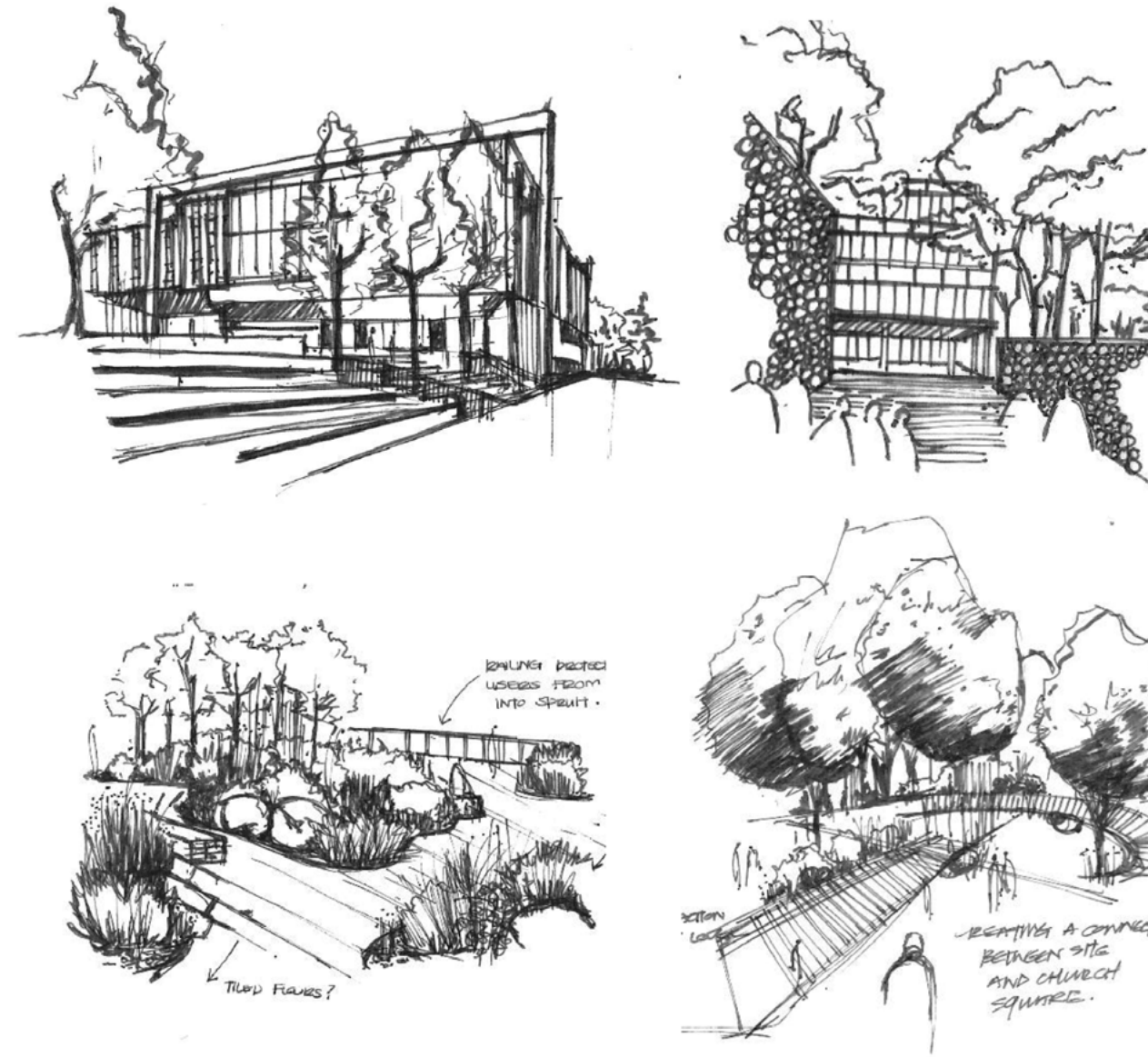
According to Anand (2008):
"The phenomenology of architecture is thus "looking at" architecture from within the consciousness experiencing it, through architectural feeling in contrast to analysis of the physical proportions and properties of the building or a stylistic frame of reference. The phenomenology of architecture seeks the inner language of the building".

Steven Holl also recognises that consciousness is designed to reveal the structure of experience, expelling any assumptions or preconceptions.

Fig 5.34: Phenomenology of spatial perception (An, 2008)

Holl pursues a direct investigation of the urban environment where he examines pure data, the essence of how things are felt, seen or experienced. By emphasising on sensory, Holl refuses approaches to the design of cities that use typologies as conceptual points of departure. Holl concerns himself with portraying the perceptions of pedestrians moving through the complex vertical and horizontal spaces of the city; thus, he reverses the drawing process, projecting it from perspectival space backward into plan.

Inspired by this theory, the design process starts off with the exploration and depictions of users moving through multi-layered spaces to bring about sensory, evoke emotion, give a sense of texture and most importantly make the concept come alive. This perspective view to plan and elevation design approach has helped the project communicate more naturally, poetically and has introduced a sense of value, understanding and depth. Humans identify themselves with a time and place and associate a feeling to that place; therefore, it was imperative that the design acts as a catalyst for the identification of its users through the sensory anthropology.



A phenomenological approach to place as explicated by Norberg Schulz (1980) can be described in three steps:

- Step one: create a distinction between natural and manmade constructs
- Step two: qualify the inside and outside, the relationship between earth and sky
- Step three: evaluate the character; this refers to how things are made and exist as participants in their environment

Fig 5.34: Conceptual illustrations Phenomenology of spatial perception through natural landscapes

THE BIOPHILIC PHENOMENON

EFFECTS OF LIGHT, SHADOW & COLOUR PSYCHOLOGY

Before the discovery of antibiotics in the 1930s, the healing power of the sun was a favoured as an alternative treatment supported in the health-care community. Sunlight therapy, also known as heliotherapy, introduced in the late 19th to mid-20th century, was the most successful treatment against infectious diseases.

Medical research has shown that patient exposure to controlled amounts of sunlight dramatically decreased high blood pressure, lowered elevated cholesterol found in patient blood streams, lowered abnormal high levels of sugar in diabetes and increased the number of white blood cells in the body, which people need to help resist disease.

By 1933, studies there were over 165 different diseases for which sunlight proved to be a beneficial treatment. Patients suffering from gout, rheumatoid arthritis, colitis, arteriosclerosis, anaemia,

cystitis, eczema, acne, psoriasis, herpes, lupus, sciatica, kidney problems, asthma, and even burns, have all received great benefits from the healing rays of the sun. However, due to the rise of the modern era, the shift towards man's dependence on technology led to the growing power of the pharmaceutical industry, and therefore heliotherapy was no longer used as a core treatment in medical institutions (Basson, 2014).

Biophilic design recognises the significance and benefits of Sunlight and how through architecture it can be perceived as a form of psychological motivation to establish a healthy, therapeutic environment. Natural light and the sun's rays are recognised as elements capable of promoting healing and thus should form an integral part of the design of buildings constructed specifically for rehabilitation (Basson, 2014).

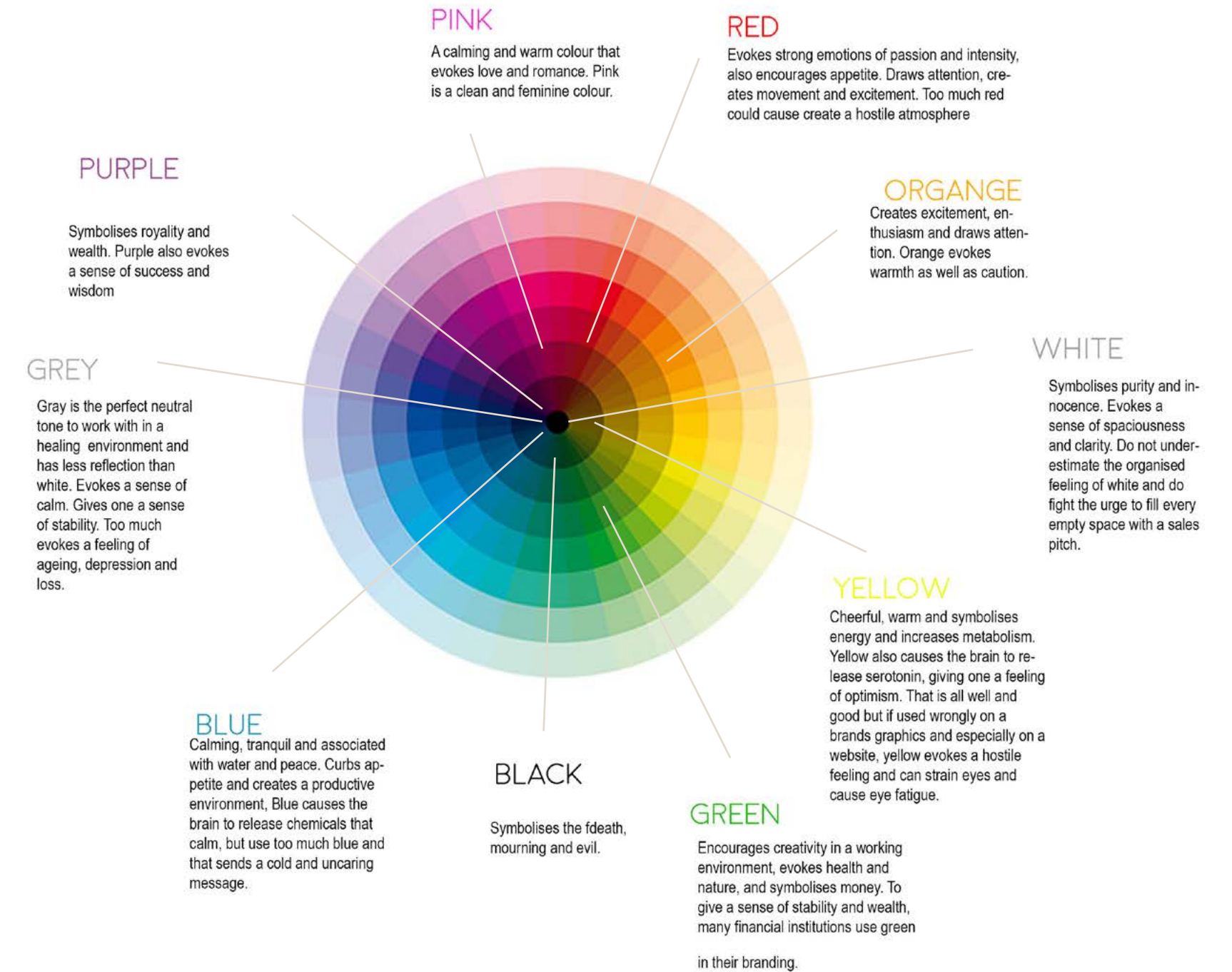
The balance or imbalance of a space can so easily be changed through the quality play, poetics and manipulation of light that can be combined with forms, colours and other natural elements such as water to create a sense of place, therefore, enhancing patient experience, transcending individuals into an alternate state of consciousness that could essentially be recollected in memory, after its lived experience during recovery (Basson, 2014).

Colour psychology has also been recognised as a significant device in Biophilic Design that has a positive effect on human behaviour, emotions and moods in any giving environment, especially when associated with the healing effects of nature (Cynthia et al. 2000). Research shows that through their combination, architecture and colour can visually stimulate the mind, therefore provoke or elevate the positive or negative emotions and connotations that patients relate with their surroundings (Dalke, 2004).

According to Johan Basson's dissertation on Adaptive healing;

"These emotions are triggered through our mental perceptions of colours in relation to the association of these colours with certain past personal events or cultural beliefs. Society's emotional response to colour is based on shared psychological associations of certain emotions to certain colours" (Basson, 2014).

Therefore, the design of the treatment facility should aim to positively contribute and realign Architecture's role in the design of health institutions to integrate the positive powers and effects of light, shadow and colour psychology into modern healing environments to encourage and stimulate specific emotional responses and use.



THE REGENERATIVE DESIGN FRAMEWORK

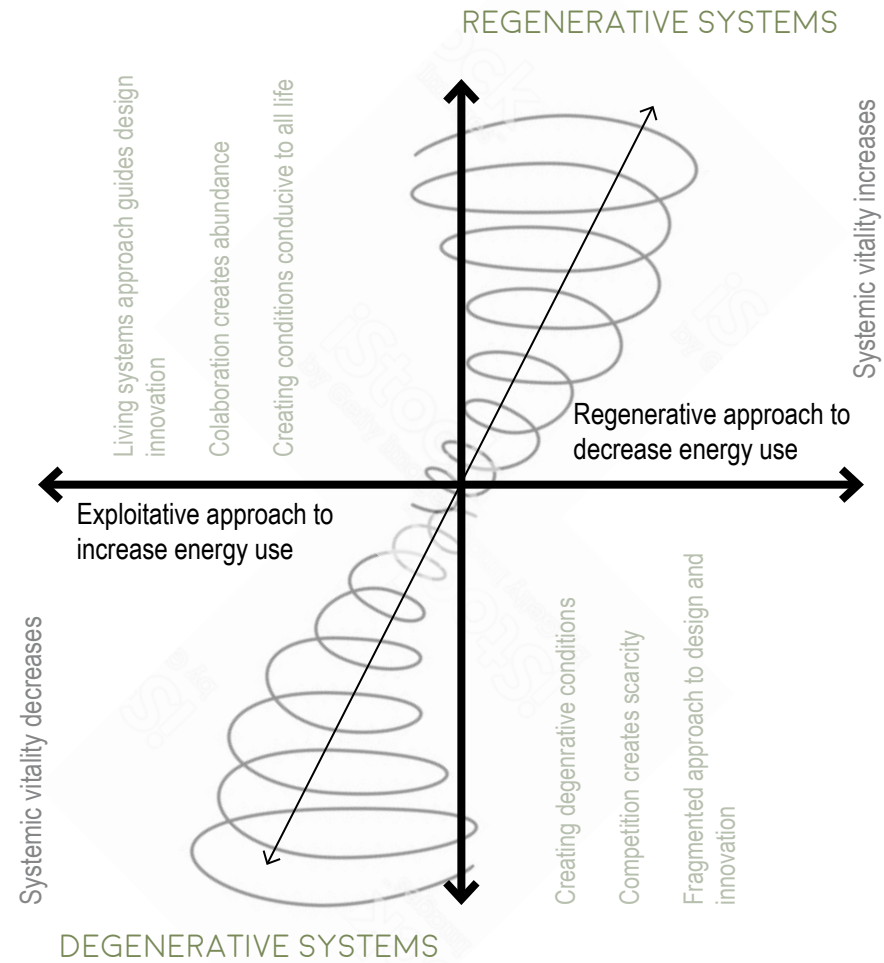


Fig 5.37: The Regenerative Design Framework (Bill Reed, 2007 edited by Author)

REGENERATIVE

Appropriate participation and design as nature

RECONCILIATORY

Reintegrating humans as an integral part of nature

RESTORATIVE

Humans doing things to nature

SUSTAINABLE

Neutral point of not doing anymore damage

GREEN

relative improvements

CONVENTIONAL PRACTICE

Compliants to avoid legal action

REGENERATIVE SYSTEMS FOR A RECONCILED LANDSCAPE

Due to its continuous transformation through excavation, halted construction, relocation of systems, productive activities and poor urban planning, the largest part of the Trevenna precinct, 75 Meintjies, is made up of a dilapidated desolated terrain that used to be the Oost-Eind Primary School sports field.

The consequences of the failed construction on site has led to a terraced landscape with uprooted vegetation, abandoned buildable material and rubble, exposed services and visible scarring that gradually increases on the sloped site that ends in a deep excavated hole, filled with ground water. This site is categorized as an urban city "block void" condition that contributes in the spontaneous development of the inherent detachment to the city's sense of place, therefore, continuously deteriorate the existing urban environment.

Regenerative Design refers to an architecture that aims to remediate the dichotomous relationship that humans have with nature. It aims to

merge and restore this integral part of the intricate and interconnected web of life. Damage to any part of this web may backfire and harm every other part as well.

This design approach surpasses biophilic design as it does not simply recommend using the therapeutic qualities of nature as a foundation for the reconnection between man and nature but rather extends itself to include the exploration of sustainable precepts and the recommendation of green technologies to support and assist in the reparations of the current disconnect and remediate any natural processes that may have been lost or broken due to modern man's disassociation to the natural environment.

The practice uses the integration of architecture back into the natural landscape as a systematic environmental tool that aims to improve and sustain all living conditions. The practice highlights how, through certain architectural models, buildings can be designed to explore, initiate and contribute in the reparations of the processes and ecosystems suffering or destroyed in the natural environment.

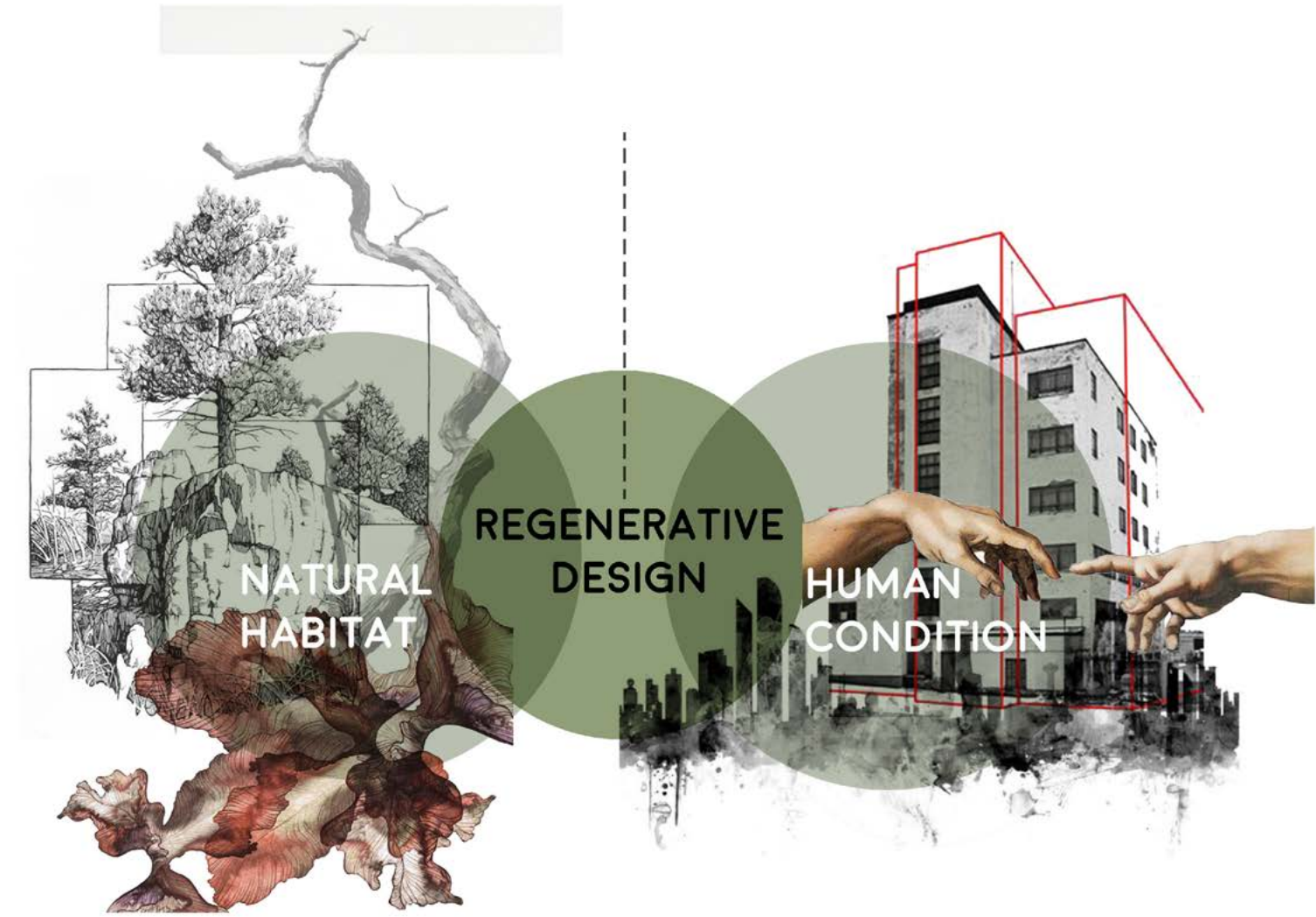


Fig 5.38: The Regenerative Design conceptual breakdown

Regenerative Design proposes the immersion of man back into nature to create a restored and resilient interdependent secular web of life, therefore, changing the connotation from “human versus nature” to humans with nature”.

The theory suggests that humans should not accept the apologetic destroyers that they have become, always finding ways in which they can minimize their damage, but should rather seek to become the co-creators of the natural environment and contribute in the design and development of planetary systems, natural patterns, sustainable tools and propose evolutionary programmatic functions that explore, adapt and improve nature's ecosystems, with the hopes to achieve ever-evolving levels of diversity, resilience and abundance.

“By obtaining the re-resources necessary for operation from its direct environment, and generating energy, regenerative architecture replenishes the resources it consumes without producing waste” (Boardman, 2010:55), (Nugent, Packard et al. 2011: online).

HEALING THE LAND THROUGH BIOREMEDIATION

It is evident that the 21st Century world is undergoing an existential crisis where the cost of living

has led to planetary consumption and environmental degradation, solidifying the tangible risk and reality of the looming self-inflicted extinction of man. Through Regenerative architecture, designers have understood that man's continued existence has culminated at a crucial point between survival and decay and have proposed an environmental model that has taken on the role to become the restorative model where the fundamental resolution is to return natural systems to their natural state, including man back into his natural habitat (Batista & Matos 2013: 116).

Bioremediation, an applied theory of regenerative design that actively investigates, remediates, manipulates and reconstructs any contaminated environment. Bioremediation is a method used to treat contaminated elements in nature including water, soil and subsurface material, by changing their environmental conditions to stimulate growth of organisms and degrade pollutants.

Through Bioremediation, architecture can act as a catalyst for the redemption, reconstruction and restorative elements of the natural landscape that have greatly been affected by human ecological decay and empty landscapes that can be replaced by a new green systems to assist in the transformation of our environmental crisis.

The process of the restoration of a given land-

scape involves different stages of intervention these stages are relevant on both an urban and site-specific scale and can be introduced through at a building scale.

The first stages of Bioremediation include the investigation of traces of contamination from human activity that are observed and understood at macro and micro levels.

Fig 5.39: Bioremediation breakdown (Martin, 2014)

BIOREMEDIATION

BIOREMEDIATION PRIMARILY BROKEN DOWN AND WILL BE APPLIED IN THE FOLLOWING 3 PRINCIPLES:

1. Phytoremediation which refers to the direct use of living plants for the clean-up, in situ, or in place, removal, degradation, or containment of in soils, air, vegetation or surface water and groundwater.

2. Biostimulation involves the modification of the environment to stimulate existing bacteria capable of bioremediation. This can be done by addition of various forms of rate limiting nutrients and electron acceptors, such as phosphorus, nitrogen, oxygen, or carbon (e.g. in the form of molasses).

3. Constructed Wetlands refer to the adaptation and improvement of already existing water bodies or the design of artificial infrastructures filled with water-loving plants and algae to improve the growth of helpful microbes.

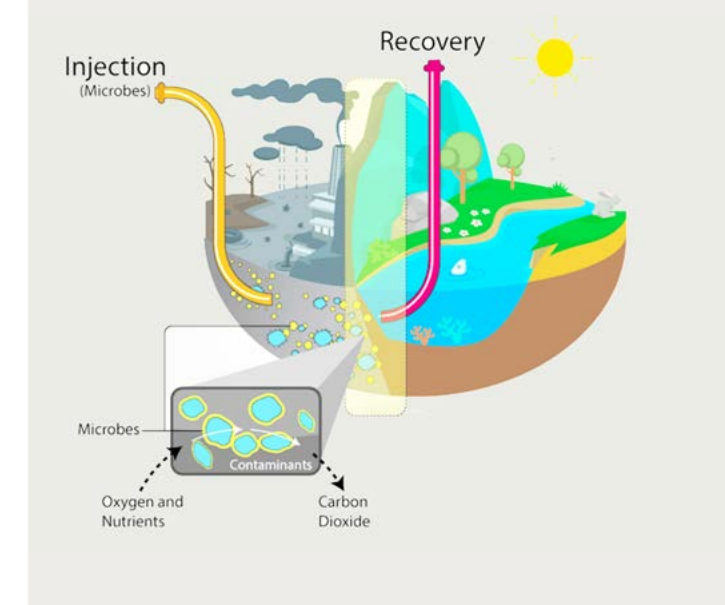


Fig 5.40: Phytoremediation process (Byjus, 2019)



PRECEDENT:

SYDNEY PARK WATER RE-USE PROJECT, TURPIN + CRAWFORD STUDIO

This project forms the City of Sydney's largest environmental project to date, built in partnership with the Australian Government through the National Urban Water and Desalination Plan. It is an integral component of Sustainable Sydney 2030, targeting 10% of water demand to be met through local water capture and re-use in the park. The City also seized the once in a lifetime opportunity to use what was essentially an infrastructure project to breathe new life into the park - as a vibrant recreation and environmental asset for Sydney. The result is an interwoven series of community infrastructures and 'made' systems - water re-use, recreation, biodiversity and habitat all integrated within the physical fabric of Sydney Park.

After an intensive process of 'easing in', the water re-use project is now fully operational and intrinsically linked with its park setting. The bioretention wetlands not only capture and clean the equivalent measure of 340 Olympic-sized swimming pools worth per annum, but successfully improve local water quality, habitat

The function and processes of water harvesting, and cleansing is enhanced through its visible ebbs and flows through the landscape. New pathways intersect the wetlands, allowing park users to explore and discover 'moments' in the landscape that can be at times playful, dramatic and peaceful, but at all times connected to the water narrative of capture, movement, and cleansing.

Highlighting these processes was an important part of the project, as they emphasise the intrinsic relationship between water, people, topography, flora and fauna. Public art is interwoven; Turpin + Crawford Studio's 'Waterfall' celebrates clean water release while also working with TDEP's cascades to aerate water in the last link in the bioremediation treatment train. Turpin + Crawford Studio also devised the water 'exhaust fans' that celebrate the transfer of water from bioremediation 'paddies' to the lagoons; playing on the spirit of water and its interactions with the landscape.

Fig 5.41: Bioremediation Sydney Park Water Re-Use Project (ArchDaily, 2015)





Fig 5.42: Bioremediation Sydney Park Water Re-Use Project: Cascading Wetland (ArchDaily, 2015)



Fig 5.43: Sydney Park Water Re-Use Project master plan (ArchDaily, 2015)

WATER AS A SPATIAL AND PHYSICAL HEALER

Due to the nature of the site and the large ground water body found on site, this dissertation specifically investigates the ways in which presence of water – either as a feature or a function – can be incorporated into the design of the proposed hydrotherapy cancer treatment facility.

The proposed project aims to explore water as an extension of biophilic design and how its therapeutic qualities of this element can then be interpreted spatially to create and facilitate a stimulating an alternative healing environment for cancer patients, family and staff in both public and private urban space, how this relationship is perceived through sensory human experience and how it can inform and enriched the design of a building, while simultaneously inducing the remediation of a once scared landscape through regenerative design.

Throughout history water and water structures have always been influential in human life. Although having undergone some transformation, water remains an integral part of our lives; water makes up to 70 percent of the earth's surface and is evidently important for every form of life. It is the unifying element of nature, connecting all the different aspects of the natural landscape.

Kellert developed a Biophilic water-based framework that provides a comprehensive understanding for the many ways in which humans are attached to this natural source. The relevant relationships with water are highlighted below Kellert (1997:42) (2005: 51-57):

1. Humanistic: the ability of man to form a bond with this natural element, to value its existence, its significance in his sense of place, and its value as a life-giving element
2. Aesthetic: This includes all the aspects of water that are found appealing to our five senses.
3. Moralistic: the sense of valuing the gift of this resource; the obligation to preserve it; equitable sharing among human and non-human users
4. Symbolic: a brook communicating to us through the gurgling of its tumbling waters; the strength and power of the flow of a mighty river
5. Scientific: lessons of aquatic chemistry, ecology and biology

Fig 5.44: "Mirroring in Water II" (Harvardartmuseums.org, 2019)



AQUA

THE PLACE OF WATER IN PHILOSOPHY AND ART

WATER AND PSYCHOLOGY

ESTABLISHING CENTRALITY USING WATER

TANGIBLE ARCHITECTURAL QUALITIES OF WATER

SEASONABLE ASPECT OF WATER



In cities we see elements with hard tissue such as concrete and ... instead of natural elements (vegetation). Therefore, we should provide hermitage and beauty by using elements that have soft tissue to give peace to the human psyche. This location can be parks and urban gardens. One of these elements is water that whether at rest or in motion, strokes human spirit. Water movement and music has a considerable role in more manifestation of green space.

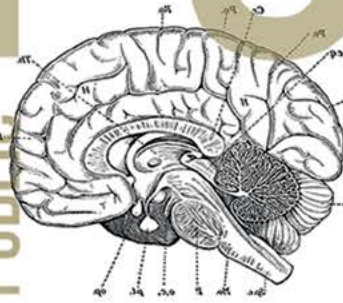


Rhythm, movement, glare, reflection, colour, sound, and transparency are all expressions of water's properties.

Water is much more of a substance that one works with, that one embraces, and that inspires the architectural object. In particular, this applies to the visual qualities and effects of water as a source of inspiration, and to its possible use in architecture



the changing light and the movement of water creating a sense of timelessness.



Presence of water is due to the emergence of many population centres that is often located in the centre core. The centrality not only is inserted in to architecture and urbanism, but also it is seen in other concepts such as religion, literary and art.

Forming, formable

1. Inviting, bonding, separator
2. Transient, current
3. Landscape and visual
4. Water sews environment together or separates them and in any case, has its role of inviting
5. Water show in top, has different modes like the colour of dishes and the way they are offered, so it
6. Creates a special landscape to reflect the environment that unity and diversity is manifested in it

The mesmeric qualities of water are of particular interest in considering sensory perception and the creation of meaning. Schiffman (1996:101) notes that the eye is automatically drawn to flickering or moving stimuli, and Gell (1992) and Morphy (1991, 1992, 1994) have shown that shimmering or visually exciting patterns can stimulate affective responses in many different cultural contexts.

The shimmer and brilliance of water provide visual stimuli that are quite different from those of most objects. The visual interest of inanimate objects is gleaned by the eye actively tracing the form and colour and detail. With water (...) the eye is presented with a luminescent image it cannot 'hold'. Instead, it must simply absorb all of the rhythms of movement and the tiny shifts and changes. (2003, p.51)

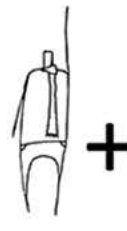


WATER IN BOTH PUBLIC AND PRIVATE SPACE THROUGH SENSORY PERCEPTION

Water often represents growth



Water can be designed in the form of streams and springs for the quiet and serene places and in the form of waterfall and large jets for crowded and busy places



VS



In transitional zones between liquid and solid, magnificent rhythms are created: from smooth and unruddled to turbulent divisions along the surface, formed by the wind.

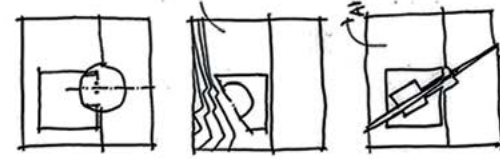
When it is dark, the water is often dominated by the local artificial light, which makes the reflection of water static.



INVESTIGATING THE SPATIATL POTENTIAL OF WATER IN BOTH PUBLIC AND PRIVATE SPACE THROUGH SENSORY PERCEPTION

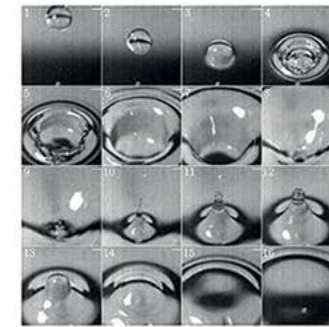


The reflection of the water can also take over an object's interior. Every movement that the water makes, and every disturbance of the water's rhythm, can immediately be seen on the walls, floors, and ceilings. A beautiful game of movement, rhythm, and structures gives the interior an extra dimension, and unfolds like a movie on the screen.



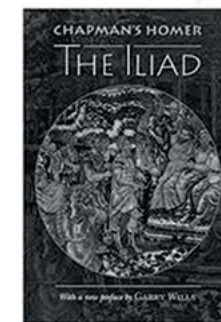
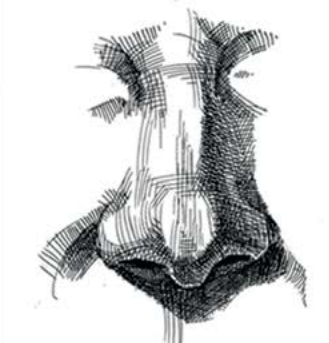
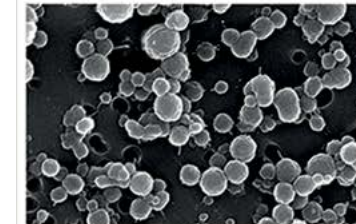
All of these effects of water are not only tangible, but are also very useable across the whole breadth of architecture. An object that is on or alongside the water is embraced by the water; its volume is reflected in the water.

The water's rhythm and texture are highly dependent on the speed and direction of the wind, on obstacles in the water, on the composition of the soil, and on the type of sea floor. The sound of water is strongly influenced by the strength of the wind and the obstacles located in and around the water, and the hardness of the water largely determines how the sound is carried.



MAGNITUDE OF WATER FALLING ALSO CHANGES SOUND
RAIN DROP VS BUCKET VS TAP DRIPPING VS POURING INTO GLASS VS SHOWER

Water contains an amount of solid matter in suspension, as well as bacteria, algae, and organic materials that can lead to a certain taste and smell. The wind and the increase in temperature are responsible for amplifying and spreading the smell.



In the summer, the water makes a viscous impression. The sun is high in the sky, and the hardness has disappeared. The reflection is often golden, and in a certain sense lacks sharpness. On the horizon, it take on the colour of the air; there is hardly any separation

Homer in Iliad writes about it: The Okehanos : Homer knew the existence of the universe and all effects of existence and nature, thanks to the presence of water, and believed that everything was taken from it.

THE PLACE OF WATER IN PHILOSOPHY AND ART

In the winter, the sun is low and the days are short. During the day, the water makes a major impression. It appears sluggish; everything seems to be moving more slowly, but the movements that the water makes are often rough and fierce.



In the spring, everything seems to be lighter. The movements of the water are velvety soft and rhythmical, almost impalpable. By day, the colour is often a golden yellow, and the sunlight can be sparkling and bright

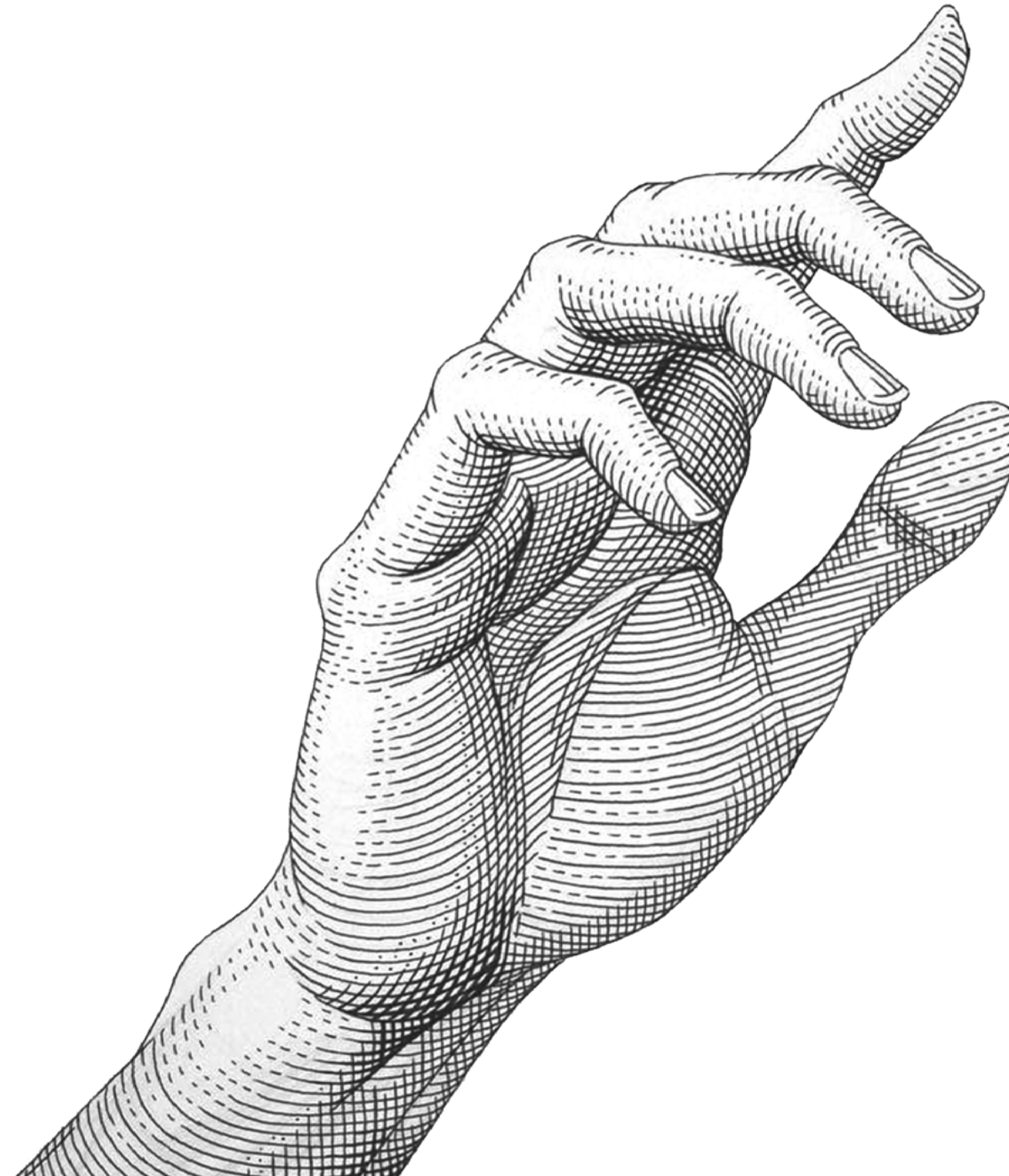
The smell reveals a bright freshness. The sound of rippling can often be heard, and is sometimes very sharp and shrill



- Establish different sounds of water :
1. Water on water
 2. Water on concrete
 3. Water on Timber/brick
 4. Water on Steel
 5. Water on low volume of water
 6. Water on deep volume of water
 7. Water into wetland

06

Fig 6.1: "The Hand" (Knaap, 2013)



05.

PROGRAMME & CLIENT

This chapter identifies the proposed programme, an Urban Oncology Wellness Centre, that deals with the education, research therapies and treatments of cancer. The programme critiques the current sterile healthcare design typology and conventional curative methods of treatment by introducing a human-centred approach; a multi-dimensional approach that focuses on the combination of curing, healing and well-being.

In order to create a human-centred approach, healthcare should enter a phase of transformation where the core of healing focuses on the transition of the patient. This chapter will discuss the experience of a cancer patient and give insight on their individual healing journey and healing relationships with family, friends, doctors and staff as an integral part in the success of the 21st century healthcare environment. Furthermore, the examination of the Seven Levels of Healing and a cancer experience map are used to express the programmatic requirements, intentions and therapy methods to create an ideal oncology centre.

LE GUERISSEUR. AN URBAN ONCOLOGY WELLNESS CENTRE

INTEGRATIVE CARE

Healing is defined as the act of making one whole or soul again, it refers to the balance and contentment of the mental, spiritual and physical state, a holistic and human-centred approach. Healing is should be the sole purpose of all medical institutions. However, due to rapid technological advancements, facilities have shifted their focus to one that is more machine dependent, one where functionality and rationality of space is determined by the spatial accommodations and requirements for medical technology, providing effective and efficient care during treatment.

The move away from the human-centred approach has led to inhumane 'healing' environments, it has created a disconnect between healing environments and their patients, which negatively impacted their wellness, well-being and hindered recovery speed and overall rehabilitation, facilities can no longer a sense of place, atmosphere of healing, nor does it encourage any positive feelings during recovery. Therefore it is important that medical institutions are designed with a patient-centred awareness that facilitates all supportive treatments and characteristics of design that may reduce anxiety, lower blood pressure, encourage healthy living, lessen

physical, emotional and mental pain or instability and boost morale during treatment, therefore influencing the health care outcomes of the patient.

This dissertation programmatic intentions aims to investigate and introduce a new Urban Oncology Wellness Centre, called Le Guérisseur which translated in French means 'The Healer'. The urban oncology wellness centre works beyond the physical treatment of cancer to include wellness and well-being by valuing the essence of nature and combining the various characteristics of the natural environment to create an optimal healing space that supports and improves the quality of medical care.

Due to the prominent presences of water on site, the oncology centre puts a specifically focuses on the therapeutic qualities of **WATER** and how this element can become the **HOLISTIC** thread that combines chemical, natural, physical, mental and emotional treatment of patents, therefore, emphasising a **HUMAN-CENTRED** approach the focuses on the human body being central to an experience that is **MEDICAL, SENSORIAL AND SPATIAL**, this is interpreted through the idea of '**SLOW LIFE HEALING SPACES**', an spatial design concept that that promotes a better quality of life not only for patients, but also for families and staff.

The project intends to transform the current disconnect between architecture and landscape through the fusion of brick, concrete and steel with water, soil and vegetation to create a balance, harmony and synergy in design, therefore changing the current relationship present in Trevenna from "building in a landscape" to "building as landscape"; by encapsulating the qualities of nature in order to create a healing habitat that would not only encourage human interaction, rest, reflection and healing but also simultaneously becoming a catalyst for regenerative design, as the return of man back to nature would induces the remediation of a once scared landscape.

The site ties into the larger vision of concept, extending the theory of therapeutic architecture to address and restore the poor ecological conditions predominantly in the west of the capital city. The site therefore becomes a patient.

LE GUERISSEUR

Inspired by the theories, objectives and designs of Margaret Keswick's Maggie Centres, Le Guérisseur becomes an interpretation of the Maggie centre, valuing the therapeutic qualities of nature and specifically water, offering a transformed, refreshed take on cancer medical treatment.

Water and landscapes are the catalyst through which Le Guérisseur establishes refugee, retreat and rehabilitation for those seeking treatment and therapy from the illness. It becomes an escape within the city, a day clinic accommodating up to 100 patients per day.

In choosing an area to work in, it becomes imperative to consider the current locations and designs of cancer treatment centres. Oncology centres are either are usually situated on the periphery of urban cites, or deep with in suburban areas or usually a small added wing or block attached to big hospitals in urban environments, they do not receive enough spatial, autonomy, awareness and recognition and therefore sometimes go unnoticed. Their disconnect to the urban environment not only further impacts the health

of patients, but it has also greatly affected family, visitors, staff and doctors' attitude, capabilities and responses to sensitive and traumatic real life or should I say life and death experiences.

Their dissociation with the urban environment prevents a sense of normalcy, further emphasizing the drastic changes or traumatic realities of one's journey during their cancer treatment. By choosing to work in the dense urban fabric of Trevenna, in Pretoria, would be an appropriate site location as the proposal meets the demand for cancer treatment in the city, adding to the city's medical infrastructure and it has the power to reinstate the idea of "home" by creating a sense of normalcy or familiarity, inducing a sense of order, comfort and calm for all peoples involved, especially patients therefore fulfilling the noble narrative of receiving rehabilitation.

Fig 6.2: Conceptual illustration of Le Guerisseur





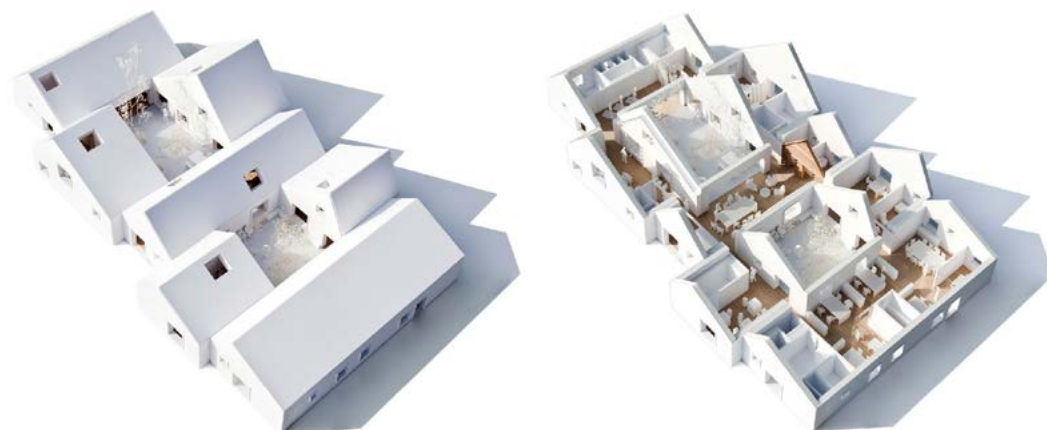
Fig 6.3-6.8: Livsrums (ArchDaily, 2012)



PRECEDENT:

LIVSRUM CANCER COUNSELLING

Livsrums designed by EFFEKT Architects is a winning competition project for a new cancer counselling centre for the Næstved hospital in Denmark. Inspired by the notion of Therapeutic Architecture and by implementing the theory of Biophilic design and Evidence-based design the building was designed as a cluster of seven small houses with varying roofs connected around 2 central green courtyards. Although each house works independently as each has its own specific function, they combine to form one coherent cancer centre. Wellness treatments and spatial functions include a library, kitchen, conversation rooms, lounge, healing gardens, gym and therapy rooms a focus on the users' comfort and wellbeing.



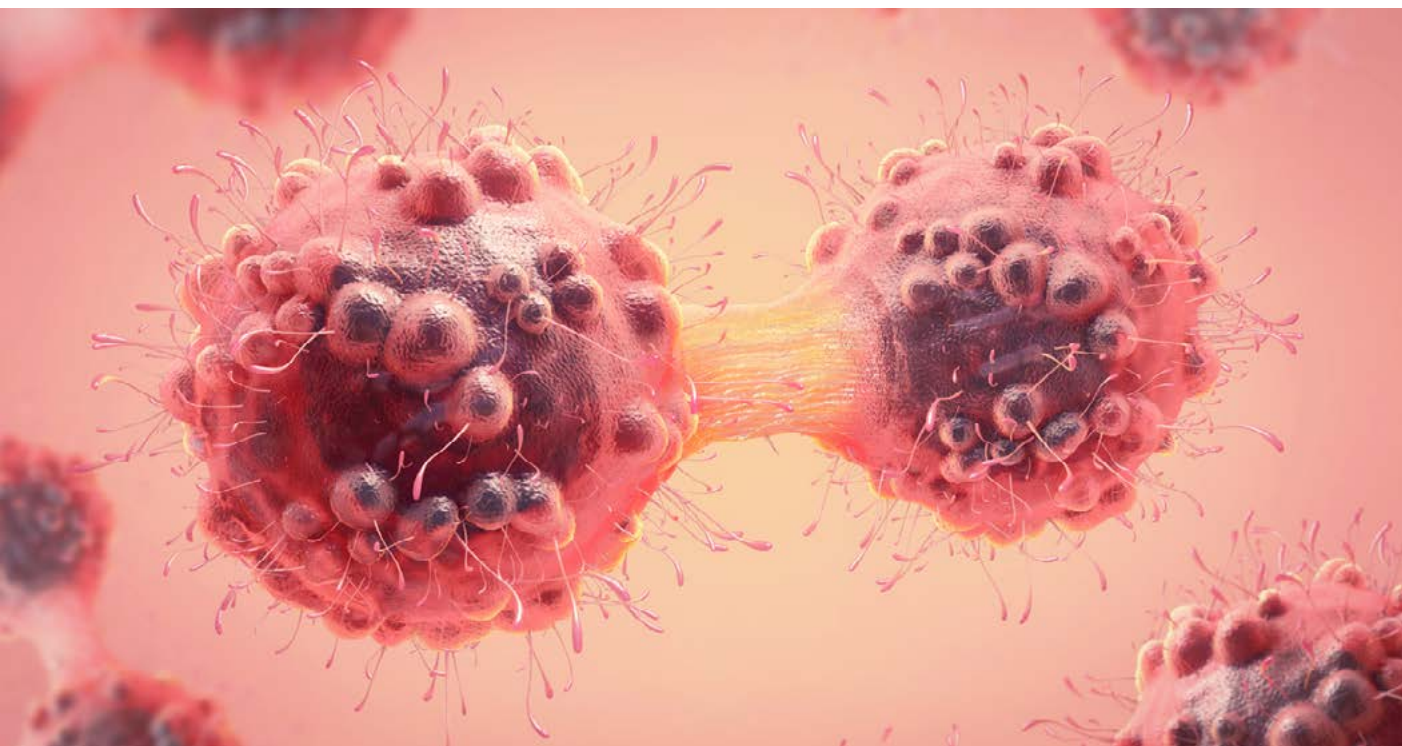


Fig 6.9: Cancer Cells (Cancer Treatment Centers of America, 2019)

CANCER

Cancer, also known as malignancy, is defined as the abnormal growth of biological cells in the body (WebMD, n.d.). Any and all cancerous cells can spread to any part of the body and with or without treatment, it can eventually kill you. (American Cancer Society, 2016).

7.4 million people die of cancer annually, worldwide. It has become the leading cause of death, causing about 13% of the world's mortality. According to the American Cancer Society, at least one in three people will have cancer and one in nine people, if they survive it the first time, are at risk of developing the disease again (Visually, 2011).

When you're diagnosed with cancer, your life completely changes, you embark on an unfamiliar journey that requires strength, hope and perseverance as you take on a new identity as a cancer patient. Through the applied theory of Therapeutic Architecture, it is evident that the architecture and design of medical environments play an integral role in the rehabilitation of patients, as their design can increase recovery time by effectively inducing a successful healing environment. For this reason, it is imperative

that the needs, expectations and desires of the patients are recognised and visually realised in order to provide the proper care, comfort and treatment needed to heal.

CANCER CURING TO THE HEALING CONTINUUM

Due to the complexity and dangerous of the illness, the curing process of the disease occurs over a long duration of time and even so, the healing process might not be successful. Patient lives a reduced to spending extended periods of time in treatment centres and hospital wards, their battle consumes their lives and whether it is successful or not, the design of healthcare facilities barely considers this process. spend extend periods of time in treatment centres and hospitals.

As Samueli (2011, p.3) stated:

“Our inherent healing capacity is the most powerful resource we have for enhancing productivity, preventing disease, accelerating recovery from illness and injury, and maintaining well-being

when disease cannot be cured.”

Therefore, it is important that designers address the current care or lack thereof that patients experience during their treatment. Healthcare facilities inability to cure and heal patients emphasises their inadequacy of the current typology of cancer treatment centres, therefore, the treatment of cancer should be a curing to healing continuum. (Samueli Institute, 2011, p.3).

A JOURNEY WITH CANCER

Angelo Merendino, an American photographer, documented his wife's, Jennifer, journey and battle with cancer. Fig xx, xx and xx show poignant and haunting photographs shot throughout the stages of her disease. These photographs are now the focus of a book, titled "The Battle We Didn't Choose".

"In April of 2010 our biggest fear became our reality. A scan revealed that Jen's cancer had metastasized to her liver and bone. Jen started receiving treatment immediately. After a few months we noticed that many people didn't understand how serious Jen's illness had become and we felt our support group fading away. Our life was a maze filled with doctors appointments, medical procedures, medications, and side-effects. The thought that I might be a widower before I was forty felt like someone was kicking me in my gut. Over and over and over. We didn't expect anyone to have the answers; we just needed our family and friends to be there. Something as simple as sending a text message saying, "I love you," or dropping off dinner after we had spent all day in

the hospital, these things were incredibly helpful."
- (Merendino, 2013)

Words would fail when it came to the explanation what was going on or as they both attempted to share with their family and friends how much help and emotional support they needed.

As a result, with his wife's permission, Angelo started to photograph Jennifer's journey, he decided that if people see what they are going through, then maybe they will start to understand. Photos have a powerful way of depicting an experience.



Fig 6.10: Jennifer Merendino, a cancer patient, photographed by her husband during various stages of her battle with cancer. (Merendino, 2011)



Fig 6.11: Jennifer Merendino, a cancer patient, photographed by her husband during various stages of her battle with cancer. (Merendino, 2011)



Fig 6.12: Jennifer Merendino, a cancer patient, photographed by her husband during various stages of her battle with cancer. (Merendino, 2011)

HEALING RELATIONSHIPS

PATIENTS, THEIR FAMILIES AND MEDICAL STAFF AS FOCUS

Human healing relationships are defined as the social interactions that occur between patients, families, friends and staff in medical environments that intend to induce a sense of belonging, consistency, well-being and healing.

The design of any healthcare facility can either have a positive or negative influences the presence or participation of these interactions as the spatial design can either encourage or deter patient, good communication, participation, work, collaboration and the integration of all parties involved in the journey of improving health and healing. (Steelcase Health, 2015, p.13).

PATIENTS

The dissertations 'Human-Centred' approach to a new healthcare typology intends to see the patient as the core focus of the design, a parallel 'Patient-Centred Care'. The patient's journey becomes the central focal point in the spatial design of the oncology centre, providing them with the independence, personal control and the ability to make choices in their current unfortunate situation, this autonomy significantly and positively influences the outcome of their medical care.

The 'Patient-Centred Care' approach aims to create an environment that is influenced and spatially designed to comprehend, acknowledge and support the patient's condition at any stage of cancer during treatment. This requires a full understanding and provision of specific needs, comfort, information, and therapy that intends to always promote healthy living and a positive outlook on life. A patient's journey and comfort during the several stages of treatment require specific architectural design consideration, which due to the various sensitivities caused by cancer, may be completely different to the design of a typical hospital today.

Designing for cancer sensitivities and conditions become a vital design informant, as the awareness and focus of their altered perception, side effects of their condition or treatment can provide a basic understanding for spatial requirements needed to be applied in order to achieve a successful induced healing environment. An empathetic approach to the patient's condition will guide the different levels of comfort, interaction and healing experienced in the oncology centre, therefore creating a dynamic healing environment.

FAMILY SUPPORT

In the healthcare design, the support of family and friend their presences and interaction has been limited to waiting areas, scheduled visiting hours or the small chair sitting in the corner of the patient's room. A patient-centred design should acknowledge the significance that their familiarity and presence can add to the patients comfort, reduce stress and anxiety.

"The greater strength of the social or maternal instincts than that of any other in or motive."
Charles Darwin.



Fig 6.13: Jennifer Merendino, a cancer patient, photographed by her husband during various stages of her battle with cancer. (Merendino, 2011)

Darwin believed that all empathetic, sympathetic and understanding communities are more successful in the making and raising of healthier offspring to the age of viability, independence and reproduction.

Studies observed and portrayed that simplistic sympathetic touches processed by medical receptors attached to the human skin show a multitude of beneficial physiological and psychological responses that all contribute to the increase in well-being of the patient.

Inspired by Darwin's theory, Dacher Keltner and Matthew Hartenstein, psychology professors at UC Berkeley, conducted a series of studies on emotion and touch to further prove this notion. The professors proved that the human emotions can be conveyed through direct touches, like facial expressions. A study was done on the anxiety of participants sitting and waiting to get an electric shock. The aim was to measure, detect and determine the anxiety, fear and activation of threat-related parts of the brain. Activated regions of the brain were quickly turned off once the participants were comforted by someone close, when a loved one held their hand.

The familiar touches activated the vagus nerves, a bundle of nerves in the chest that calms the fight or flight cardiovascular response and triggers the secretion of oxytocin, the 'happy hormone', which enables feelings of comfort and trust, therefore lowering stress and anxiety.

Therefore it is evident that there is a need for an unrestricted presence of loved ones to ensure that the patients are not going through this journey on their own; furthermore, it puts the family and friends at ease as they gain more knowledge on the disease, various treatments and they are able to indirectly take care of them.



Fig 6.14: Jennifer Merendino, a cancer patient, visited by her family and friends during her chemotherapy treatment. (Merendino, 2011)



Fig 6.15: Jennifer Merendino, a cancer patient, visited by her family and friends during her chemotherapy treatment. (Merendino, 2011)

MEDICAL STAFF

The needs of medical staff in the healthcare environment are often unnoticed, overlooked or under designed. Medical staff are often given small poorly ventilated or lit staffrooms, cramped nurse stations and non-existent amenities. Their lack of design considerations greatly affects the staff's moods, morale, work ethic, communication and how they treat patients which has an immense impact of their interaction, wellness and well-being. There is an opportunity for the design of any healing environment to address and consider

the healthcare of staff as their well-being or lack thereof can be reciprocated or deflected on to the patients that they work with.

This gap in design provides an opportunity to reconsider and address the needs and beneficial working facilities for medical staff, this transformation will result in a change in their physical, cognitive and emotional well-being, which will ultimately boost their morale, positively influence work ethic and ability to provide the proper care to patients.

Staff interrelationships will also be affected, as the proper design of their medical amenities and facilities, where it be through the incorporation of lounges or private gardens, it will encourage staff interaction, better communication and greater job satisfaction, therefore contributing in the design of a balance congenial atmosphere need between patients and staff.

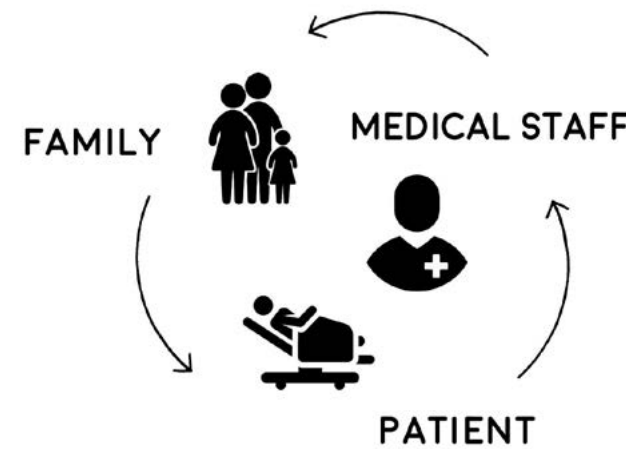


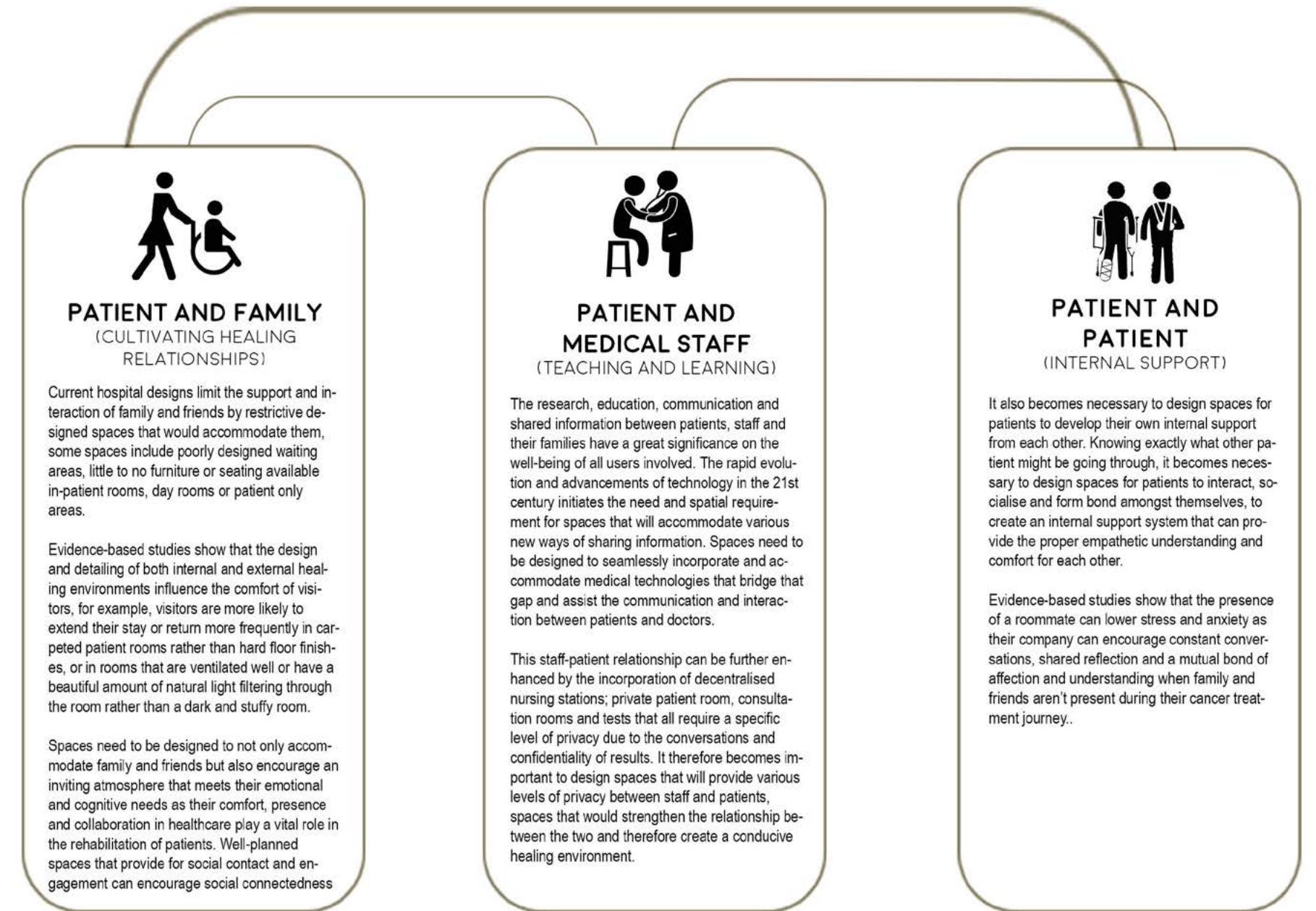
Fig 6.16: Integrative Care Relationships

INTERRELATIONSHIPS

SOCIAL SUPPORT

It is evident that various kinds of social support can lower the stress, anxiety and fear that patients face during their cancer treatment. Not only does social support improve recovery outcome, but it can also increase the rate of rehabilitation, therefore it is important that the oncology centre places a heavy focus on the incorporation of welcoming environments that encourage various user interactions such as meeting, and socialising, an environment that promotes relaxation, reflection, safety and security. Social support can be controlled by the boundaries that lie between public, semi-private and private spaces. One can use spatial sequence and self-autonomy to create the balance between social interaction, the desired privacy or loneliness.

SOCIAL SUPPORT INTERACTIONS



SLOW LIFE HEALING SPACES

Le Guérisseur intends to be a cancer treatment and wellness centre that brings about the idea and sense of place, an alternative space for patients and their families to be at home and cared for while they feel frightened, anxious or stressed, offering coping mechanisms, research, education and comfort to better their journey, develop a sense of confidence, emotional support and boost, a positive outlook on recovering and a better quality of life. What users discover at the Le Guérisseur may encourage and help patients put their lives in perspective and transform their experience living with cancer.

Through the detailed research into both patient and programme in the applied theory of Therapeutic Architecture and the various derived theories, concepts and ideas such as Biophilic Design, Evidence-Based Design, Ecopsychology, Phenomenology and Regenerative Design, the architecture of the Le Guérisseur transgresses the typical typological relationship between patient and medical processes, arriving at a non-institutional typology with a primary concern for quality of patient experience, a HUMAN(PATIENT)-CENTRED APPROACH.

The HUMAN-CENTRED approach focuses on the human body being central to an experience that is MEDICAL, SENSORIAL AND SPATIAL, therefore to control and balance the duality that lies between the medical and the experiential the building takes form in layers, shifting the medical role to one that is subservient allowing the patient realm to take priority.

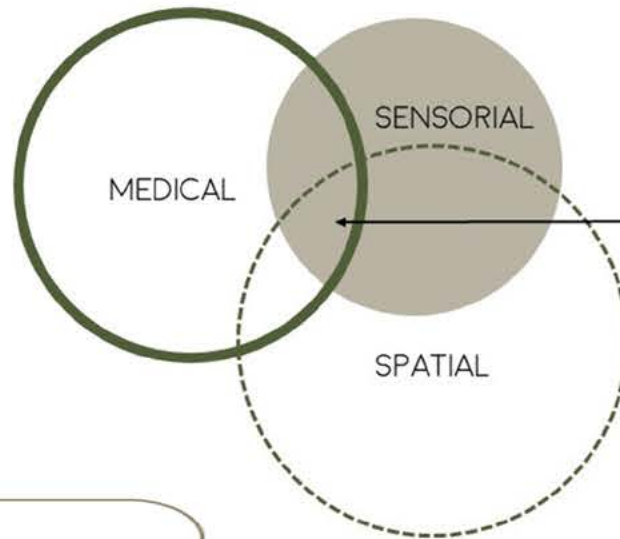
Within this patient realm a healing experiential journey is conceived, where the rhythmic compartmentalisation of palliative complementary therapies converges with the healing potential of atmospheric space.

Furthermore, the proposed programme focuses on the creation and interconnection between architecture and landscape, as their amalgamation promotes the idea of 'SLOW LIFE HEALING SPACES', an idea that investigates an architectural typology that promotes a novel lifestyle which transforms the traditional architectural expression, 'human's vs nature' to 'humans with nature, bridging the gap and re-establishing the interrelationship and duality that lies between the two.

The design of the centre is based on the simple concept of creating a multidimensional, interactive and organic journeys through a series of internal and external environments that reflect the patients narrative experience responding to contextual qualities.

The user experience is designed to be personal and unsupervised as much as possible to specifically give autonomy to patients and create a sense of mystery and discovery to further iterated and reconnect to the outermost form of the design, a series of concrete walls infused within the dense Urban Garden. The building acts as a narrative framework within which the user initiates an interaction of water, architecture and landscape, instituting a sense of wellbeing.

This thesis aims to implement the use of nature and sensory design in a health care setting, in order to create an optimal setting for healing to take place. By integrating a cancer centre with therapeutic facilities, an optimal healing environment can be achieved. Amongst other things, Le Guérisseur aims to:



SLOW LIFE HEALING SPACES

PROGRAMMATIC INTENTIONS OF THE ONCOLOGY CENTRE

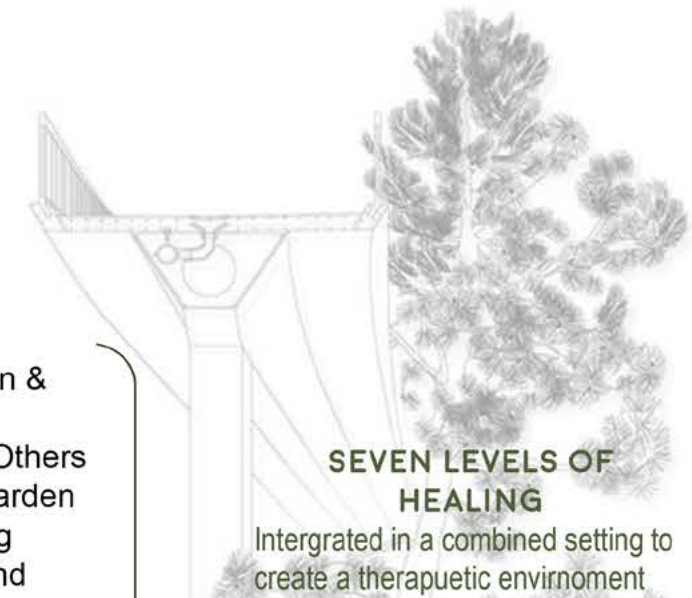
- 1) Provide a drop-in Cancer Centre, which provides a variety of treatment, including radiation and chemotherapy.
- 2) In addition to Cancer focused therapy, the center also provides alternate therapies and recreational programs. Other programs include psychological support and patient and community education peutic environment.
- 3) Design a building composed of both internal and external natural environments combined with a sensory stimulating sense of place and space, which together, create a therapeutic environment.

Programmatic intentions are explored and implemented through the study of the different 'Levels of Healing'

1. Level 1: Education & Information
2. Connection with Others
3. The Body as a Garden
4. Emotional Healing
5. The Nature of Mind
6. Life Assessment
7. The Nature of the Spirit

Due to the presence of water on the site, this disseration incoporates an additional 8th level of healing :

8. THE CONNECTION TO WATER



SEVEN LEVELS OF HEALING

Intergrated in a combined setting to create a therapuetic envirnoment

WATER AS THERAPY

The experiential journey towards healing reveals itself as a sensitive organic composition that connects various therapeutic environments that integrates water throughout. The higher you go up in the building the less amount of water the user interacts with and the more private the experience.

Fig 6.17: Slow Life Healing Spaces

THE PRESENCE OF WATER

Experiences with water in the city, operates between cold and warm, airy and saturated, up and down, intimate and public to artificial and natural. This proposal aims to portray how the architecture of the building can be informed by this shape shifting element and through its spatial manipulation, water in its various states can be explored and exposed to draw contrasts and similarities between itself and the users of the cancer treatment facility, highlighting the various ways in which this natural source can be experienced within an urban environment.

Water will appear as a boundary between public and private spaces through the creation of thresholds, hierarchies, axis, volumes, surfaces and the through its incorporation in the design of the poetics of light, sound, rhythm and movement in the design of space and form. Water used in a wide range of expressions to create a sense of place that will enhance well-being; a healing environment where senses and impressions can run free. The water will appear in the forms of

mist, water drops, light rains, reflection pools and different levels of water, to support the different water activities', characters and atmospheres that will induce a healing environment. The water is used to create atmosphere and that positively affect the human state of mind. It as a tool to alter and control the experience of desired healing spaces (Basson, 2014).

The experiential journey towards healing reveals itself as a sensitive organic composition that connects various therapeutic environments that integrates water throughout. The higher you go up in the building the less amount of water the user interacts with and the more private the experience.

By applying Kellert's developed Biophilic Water-Based Framework, the comprehensive study and understanding for the many ways in which humans are attached to this natural source, water becomes the spatial and physical healer of the programme, as a spatial and physical healer. Users experience, explore and receive healing through various interactions with water such as:

1. Humanistic: the ability to form a bond with water, valuing its existence, its role in creating a sense of place and acknowledging it as a life-giving element
2. Visual Aesthetics: The appeal of water

and perceptive influence on the five human senses.

3. Moralistic: Valuing water as an important natural resource; preserve it and sharing it with all-natural systems
4. Symbolic: Acknowledging it the different rituals and spatial representations of water
5. Scientific: Learning from water; understanding aquatic life, its physical chemistry and learning about its influence in different ecology and biological systems in nature

These interactions come to life through the design of bio pools, infill water wells, cascading water balconies, rain gardens, reflection pools, bio wetlands and most importantly, underground hydrotherapy chambers.

AQUA POETICS

Furthermore, warm sumptuous walnut retreat-like spaces that highlight the cleansing qualities of aqua therapy by inviting patients to bathe in a shallow ankle-pool, receive aroma therapy in stem baths, and reflection pools, the patient moves through these assisted hydrotherapeutic bathes where water transcends tranquillity.

Intrigued by the sensual acoustics of water, a water wheel is designed to create white noise that flows through the entire building adding to the different levels of privacy needed. In final spaces, light dances through ochre leaves taking advantage of the immuno-healing potential of Biophilic design. After traversing a shadowed compressive space, body posture and breathing open in an anthropomorphic response to scale, where towering light overwhelms in a non-denominative spiritual phenomenon.

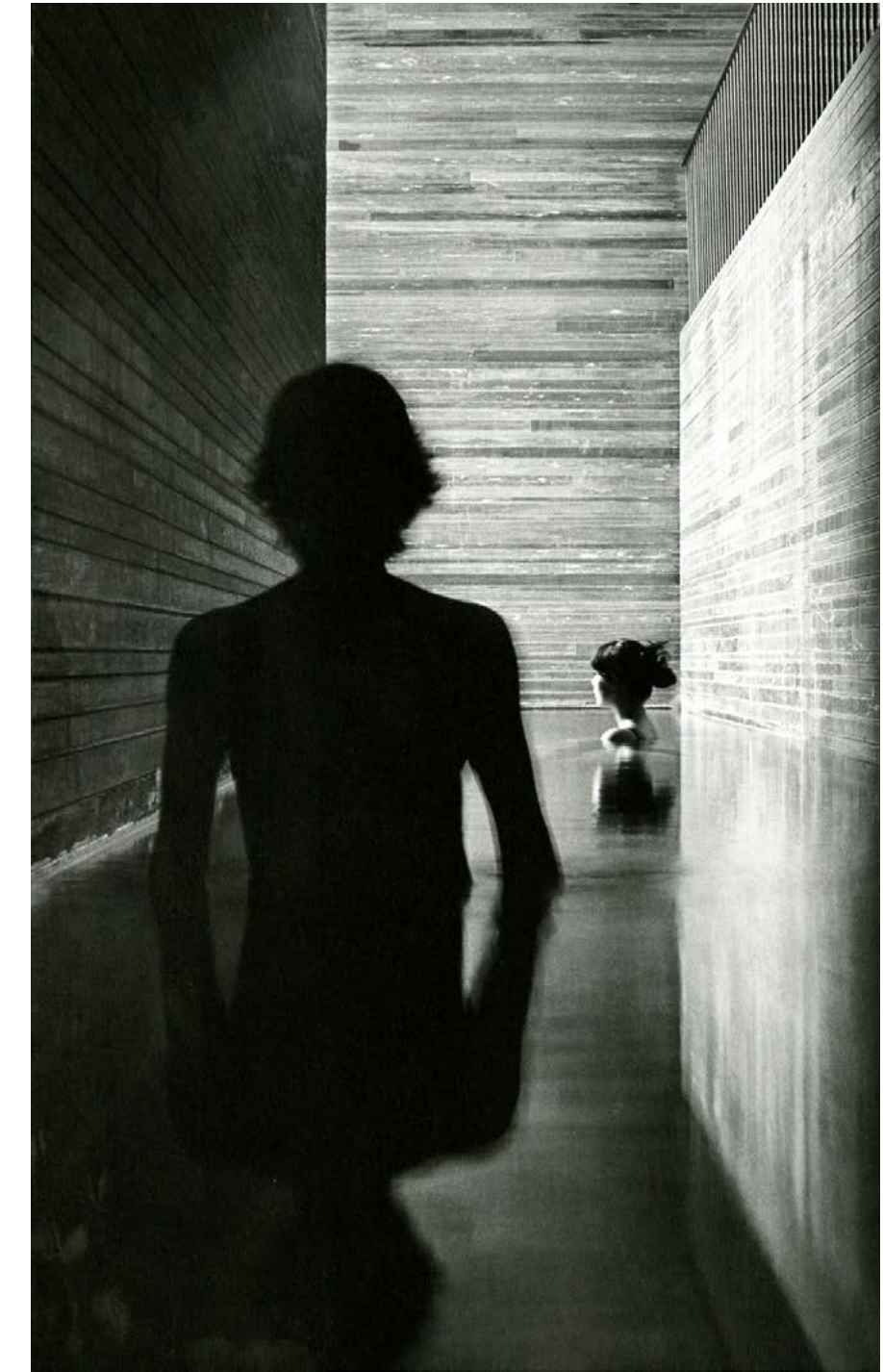
PRECEDENT:

THERMAL VALS. PETER ZUMTHOR

The underlying in formal layout of the internal space is a carefully modelled path of circulation which leads users to certain predetermined points but lets them explore other areas for themselves. The perspective is always controlled, framing view along their journey. The meander is a designed negative space between the blocks, a space that connects everything as it flows throughout the entire building, creating a peacefully pulsating rhythm. The combinations of light and shade, open and enclosed spaces and linear elements make for a highly sensuous and restorative experience.

The fascination for the mystic qualities of a world of stone within the mountain, for darkness and light, for light reflections on the water or in the steam saturated air, pleasure in the unique acoustics of the bubbling water in a world of stone, a feeling of warm stones and naked skin, the ritual of bathing these notions guided the architect. The intention was to work with these elements, to implement them consciously and to lead the to a special form from the outset. The stone rooms were but to flatter the human form.

Fig 6.18: Thermal Vals (ArchDaily, 2013)



SEVEN LEVELS OF HEALING

THESE LEVELS REPRESENT A MAP, OR TOPOGRAPHY, OF HOW HUMAN BEINGS INSTINCTIVELY SEEK HEALING AND WHOLENESS IN THE FACE OF ANY ILLNESS OR CRISIS.

CANCER EXPERIENCE MAP

Level 1: Education and Information Level 2: Connections with Others Level 3: Body as Garden Level 4: Emotional Healing Level 5: The Nature of Mind Level 6: Life Assessment

DIAGNOSIS	TREATMENT DECISION	ACTIVE TREATMENT	END OF TREATMENT	RECURRENCE
PAIN POINTS				
<ul style="list-style-type: none"> - Shock & Crisis - Feeling betrayed by your own body - Fears of incapacitation and death - How do I tell people? 	<ul style="list-style-type: none"> - Conflicting recommendations - Overwhelmed with frightening information - Fear of treatment not working - Difficult to find relevant information 	<ul style="list-style-type: none"> - Is treatment working - Anxiety about side effects - Physical pain, fatigue and nausea - Expensive care 	<ul style="list-style-type: none"> - Will the treatment be successful - Are you getting the proper care - Physical, emotional and medical challenges - Change in psychological thinking 	<ul style="list-style-type: none"> - Time frame; How much time do you have to live - Would you go through treatment again
STRATEGIES				
<ul style="list-style-type: none"> - Get all information on how to tackle stress and unexpected circumstances - Important to sympathise and empathise any emotional battles - Talk directly about cancer, do not avoid the topic or the reality of the disease - Use personal stories 	<ul style="list-style-type: none"> - Encourage patient to patient interaction and connections - When informing patients about their condition, be sensitive, "soften the blow" <p>Level 1: Education and Information</p>	<ul style="list-style-type: none"> - Recognise and acknowledge the physical symptoms of treatment - Use basic physical and psychological coping mechanisms during treatment - Be honest when talking about cancer. <p>Level 2: Connections with Others</p>	<ul style="list-style-type: none"> - Include strategies and coping mechanisms for living with uncertainties or surety - Acknowledge new life as a cancer patient and the transition - Encourage connecting with cancer survivors 	<ul style="list-style-type: none"> - What decision would work for the patient - Make sure you go through an assessment treatment based on your current condition - Decisions may be based on will to live, and personal future accomplishments
BEHAVIOURAL FACTORS				
<ul style="list-style-type: none"> - Accepting the diagnosis - Validate all emotions and focus on what you can control 	<ul style="list-style-type: none"> - Make sure you get all the information and build the support you will need - Know how to ask for the proper help 	<ul style="list-style-type: none"> - Selfcare is important - Positive look on life and promote physical comfort and emotional wellbeing within yourself 	<ul style="list-style-type: none"> - Adjusting to a new life as a cancer patient 	<ul style="list-style-type: none"> - Re-engaging - Know the options available

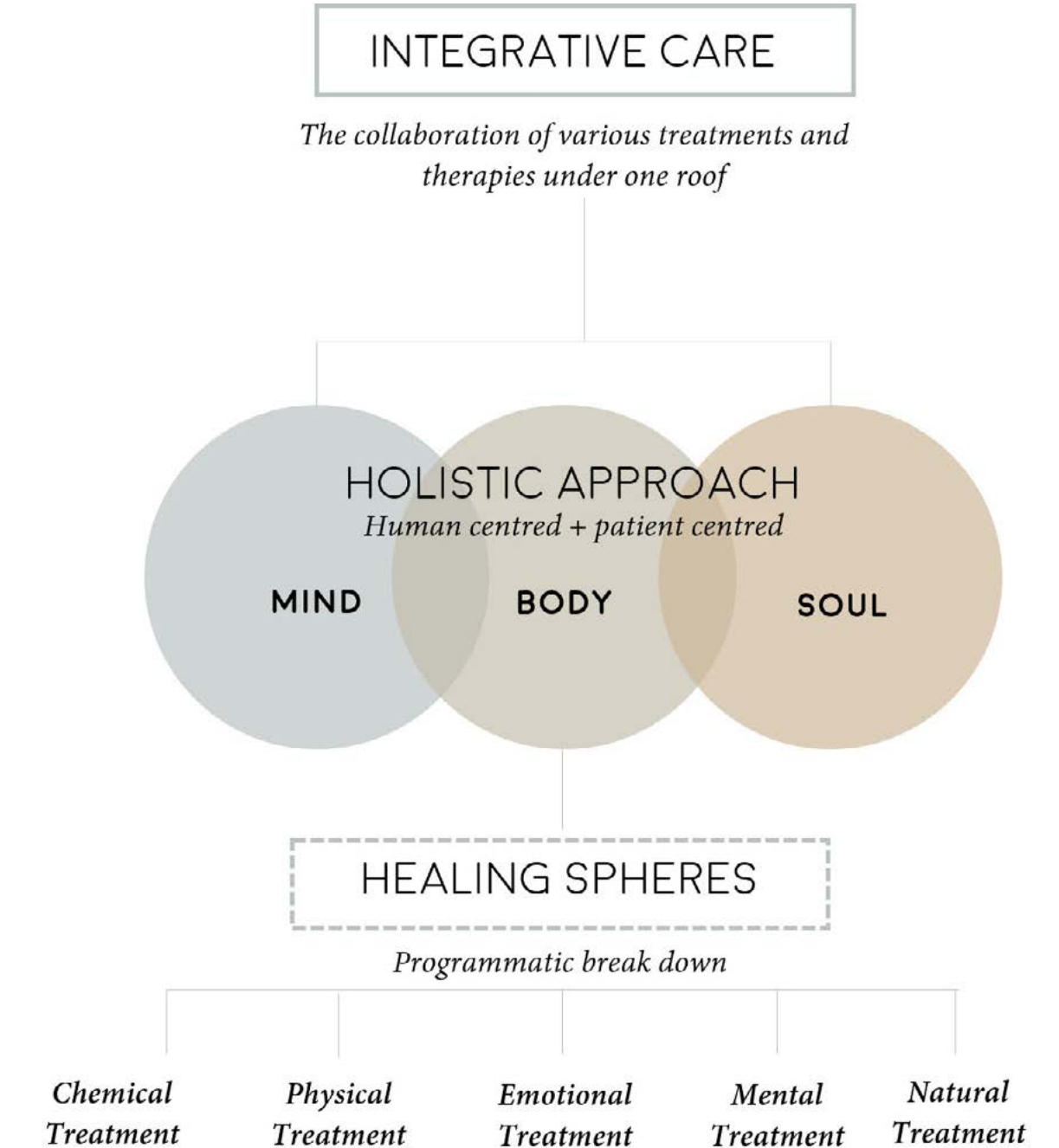
Fig 6.19: Seven Levels of Healing (Geffen, 2002)

PROGRAMMATIC REQUIREMENTS

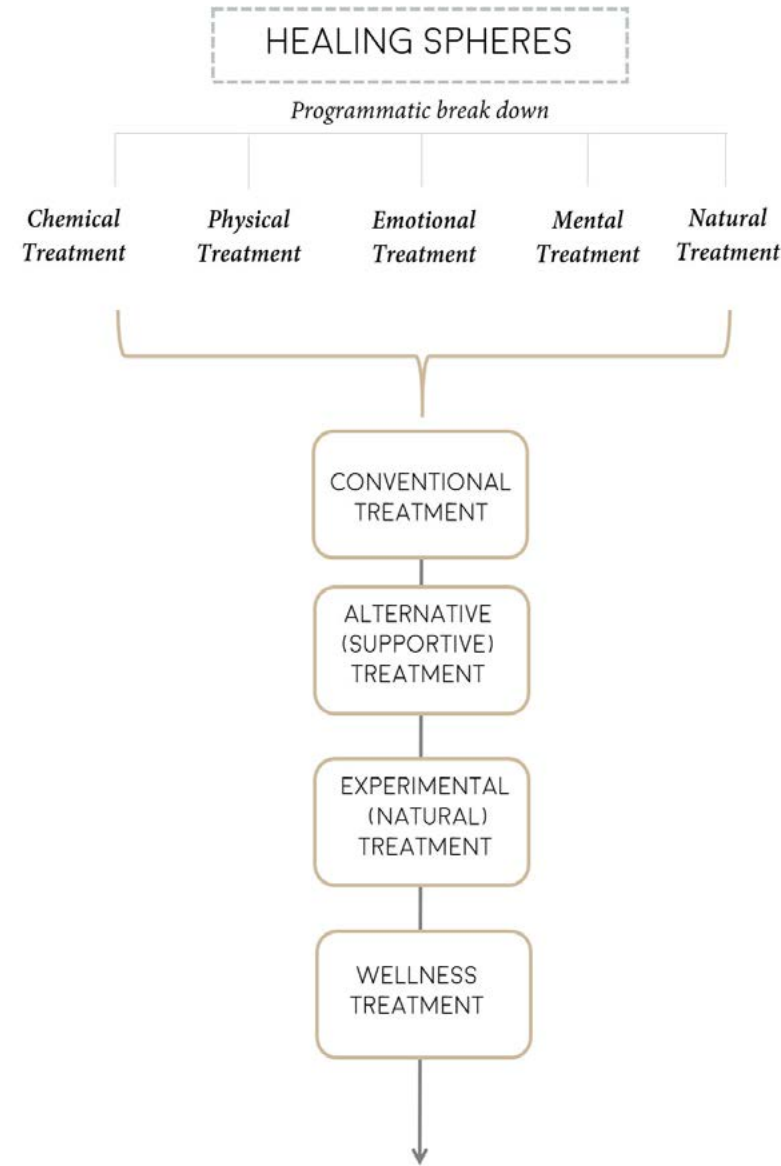
The complementary therapies, collectively fulfilling a biopsychosocial-spiritual model of healing, are broken down into programmatic experiential criteria; patients move through choice and self-empowerment internal landscapes, external corridors, semi private healing garden, internal dry landscape below, workshop areas and chemotherapy rooms, private and public therapy rooms, herbal gardens and roof top terraces which all incorporate different human scaled levels of privacy and are organised and designed to open up to a key threshold on site, a bio wetland, therefore allowing the a constant view of nature, direct and indirect interactions with water and a sense of immersion with the natural landscape.

By doing so the architectural spaces anthropomorphically materialise in scale and proportion merging with the play of light, materials nature, water, textures and olfactory stimulation, therefore all the applied theories are transformed into form, function and sense of place.

Fig 6.20: Integrative Care



SPATIAL REQUIREMENTS



CONVENTIONAL TREATMENT			
TREATMENT	SPATIAL REQUIREMENTS	USERS	LEVEL OF HEALING
Radiation Therapy	Infusion Treatment Spaces: 1. Individual private treatment room 2. Medical Storage 3. Nurse Station 4. Medical Services	Patients Staff	Level 6: Life Assessment
Immunotherapy	Infusion Treatment Spaces: 1. Semi-private treatment area 2. Individual, group & family treatment rooms 3. Communal treatment area 4. Medical Storage 5. Medical Services	Patients Staff Family	Level 6: Life Assessment
Chemotherapy	Infusion Treatment Spaces: 1. Semi-private treatment area 2. Individual, group & family treatment rooms 3. Communal treatment area 4. Medical Storage 5. Nurse Station 6. Medical Services	Patients Staff Family	Level 6: Life Assessment

ALTERNATIVE (SUPPORTIVE) TREATMENT			
TREATMENT	SPATIAL REQUIREMENTS	USERS	LEVEL OF HEALING
Naturopathic Medicine: 1. Dietary Supplements 2. Homeopathic Remedies	1. Training Kitchens 2. Herbal Garden 3. Herb drying room 4. Roof Garden 5. Green House 6. Nursery	Patients Staff Family	Level 1: Education and Information Level 2: Connections with Others Level 3: Body as Garden
Physiotherapy, Exercise, Acupuncture, Occupational therapy	Gym, Yoga and Therapy studios: 1. Semi-private studio 2. Individual, group & family Therapy studios rooms 3. Indoor & open air gym	Patients Staff	Level 3: Body as Garden
Speech therapy, Auriculotherapy and Multisensory therapy	1. Semi-private treatment area 2. Individual, group & family treatment rooms 3. Communal treatment area	Patients Staff Family	Level 3: Body as Garden Level 5: The Nature of Mind

EXPERIMENTAL (NATURAL) TREATMENT			
TREATMENT	SPATIAL REQUIREMENTS	USERS	LEVEL OF HEALING
Aromatherapy:	1. Stem baths 2. Herbal gardens 3. Herbal baths	Patients Staff	Level 3: Body as Garden Level 4: Emotional Healing Level 5: The Nature of Mind
Hydrotherapy:	Hydro chambers: 1. Light bath 2. Herbal baths 3. Watsu 4. Plunge cold pool 5. Sauna 6. Change rooms	Patients Staff	Level 3: Body as Garden Level 4: Emotional Healing
Green Care	1. Healing Garden 2. Green House 3. Internal And External self empowerment and reflective 4. Heliotherapy terrace	Patients Staff Family	Level 3: Body as Garden Level 4: Emotional Healing Level 5: The Nature of Mind Level 6: Life Assessment

WELLNESS TREATMENT			
ACTIVITIES	SPATIAL REQUIREMENTS	USERS	LEVEL OF HEALING
Rest, relaxation, leisure	1. Library, 2. Reading room 3. Music room	Patients Staff Family	Level 4: Emotional Healing Level 5: The Nature of Mind Level 6: Life Assessment
Information and research	1. Workshop studios 2. Conference rooms 3. Counselling rooms (individual, group and family)	Patients Staff	Level 4: Emotional Healing Level 5: The Nature of Mind Level 6: Life Assessment
Other Spaces	1. Reception 2. Cafe 3. Ablutions 4. Circulation 5. Staff Rooms 6. Waiting Areas 7. Inhouse pharmacy 8. Medical services	Patients Staff Family	Level 6: Life Assessment

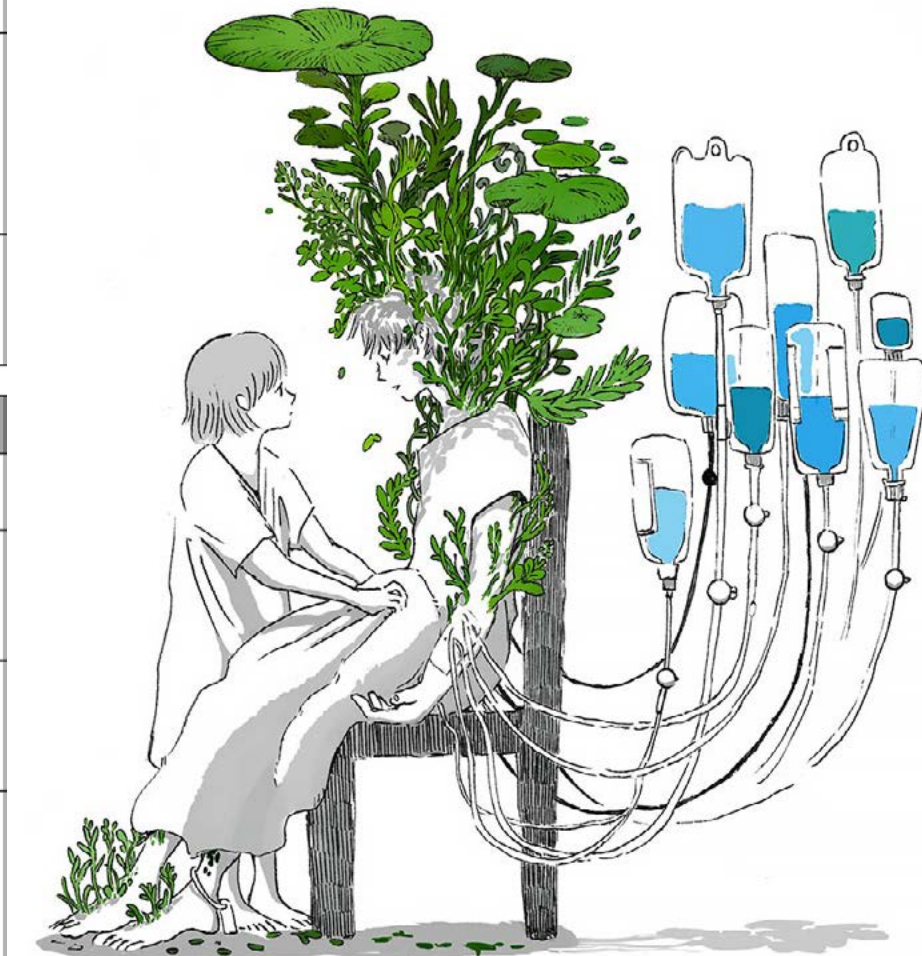


Fig 6.21: Spatial requirements

Fig 6.22: "Nature the Healer" (Marumichi, 2013)



Fig 7.1: "The Hand and Pen" (Knapp, 2013)

CONCEPT & DESIGN DEVELOPEMNT

The proposed program is an Urban Oncology Wellness Centre that would focus on the creation and interconnection between architecture and landscape, as their amalgamation promotes the idea of 'SLOW LIFE HEALING SPACES', an idea that promotes a better quality of life not only for patients, but also for families and staff.

Therefore, the dissertation intention aims to explore Therapeutic Architecture; how its application in a clinical setting can induce a healing environment for its users. This will be explored and derived from the qualities of nature, specifically water and the element can be reinterpreted into spatial forms. During the year, various design iterations took place in order to fully understand and explore all possible design outcomes that would apply the principles of Therapeutic Architecture to produce the appropriate design for an Urban Oncology Centre. These principles were explored and applied on plan, section, details and in the spatial function, form and experience of the building.

CONCEPT

THEORETICAL PREMISE

THERAPEUTIC ARCHITECTURE

Therapeutic Architecture intends to repair the broken relationship between man and nature as a consequence of the industrialisation and institutionalisation of medical healthcare. For this to be done, the combination of a biophilic, regenerative and phenomenological approach need to be applied. This approach allows for the immersion of man back into nature, allowing the two to reconnect, benefit from their respective nurturing and therapeutic qualities, therefore mending the broken bond, reintroducing a natural healing environment and developing a secular interdependent ecosystem.

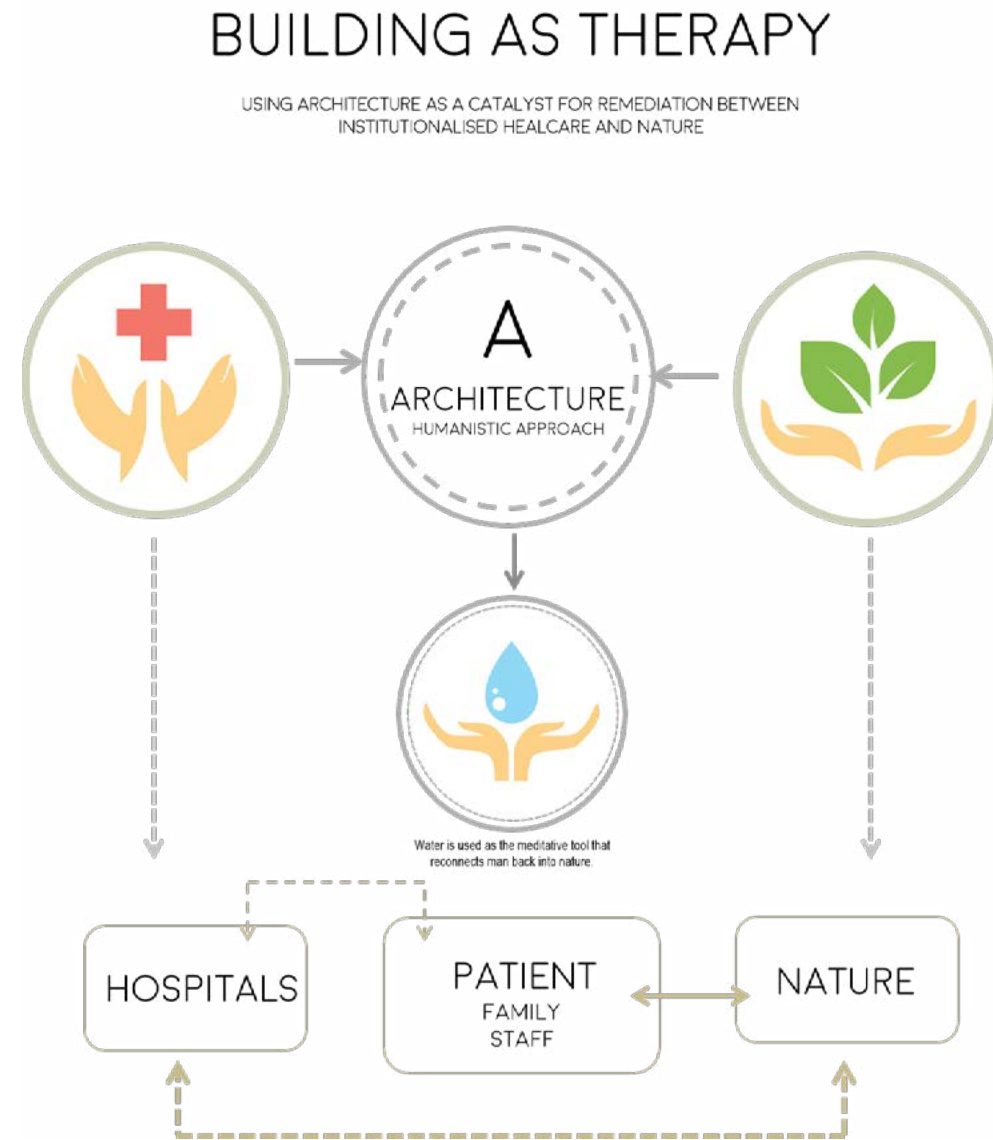


Fig 7.2: Therapeutic Concept diagram

ARCHITECTURAL CONCEPT

WATER AS A SPATIAL BOUNDARY

The architecture aims to portray WATER as a form of healing as well as a spatial element, specifically relating back to the idea of spatial practice by becoming the "boundary" between public vs. private and the "connection" between building and nature space therefore setting the site into transients by encouraging users to interact with water, architecture and landscape therefore establishing different levels of healing along a constructed landscape. Water is used as the meditative tool that reconnects man back into nature.

The Architecture aims to sequentially create and establish a relationship between users and water, it is used as their escape from their illness, immersing them into the hydrotherapeutic qualities of the element, valuing the sensory experience by manipulating sound, light, fluidity and

temperature of the spaces. The oncology centre challenges the interpretation of 'taking the water' while emphasising the social, spiritual, therapeutic and leisurely aspects of engaging with the natural element.

Therefore, by simultaneously reintroducing the ancient Greek medical typology used in the Asclepius that were designed to immerse patients in nature showcasing the healing qualities of the natural environment the architecture of the oncology centre reintroduces the symbiotic relationship between nature and medical health creating a brand new 21st century healing typology that focuses on holistic treatment; the chemical, physical, spiritual, emotional and mental healing interface.

CONCEPTUAL DIAGRAMS

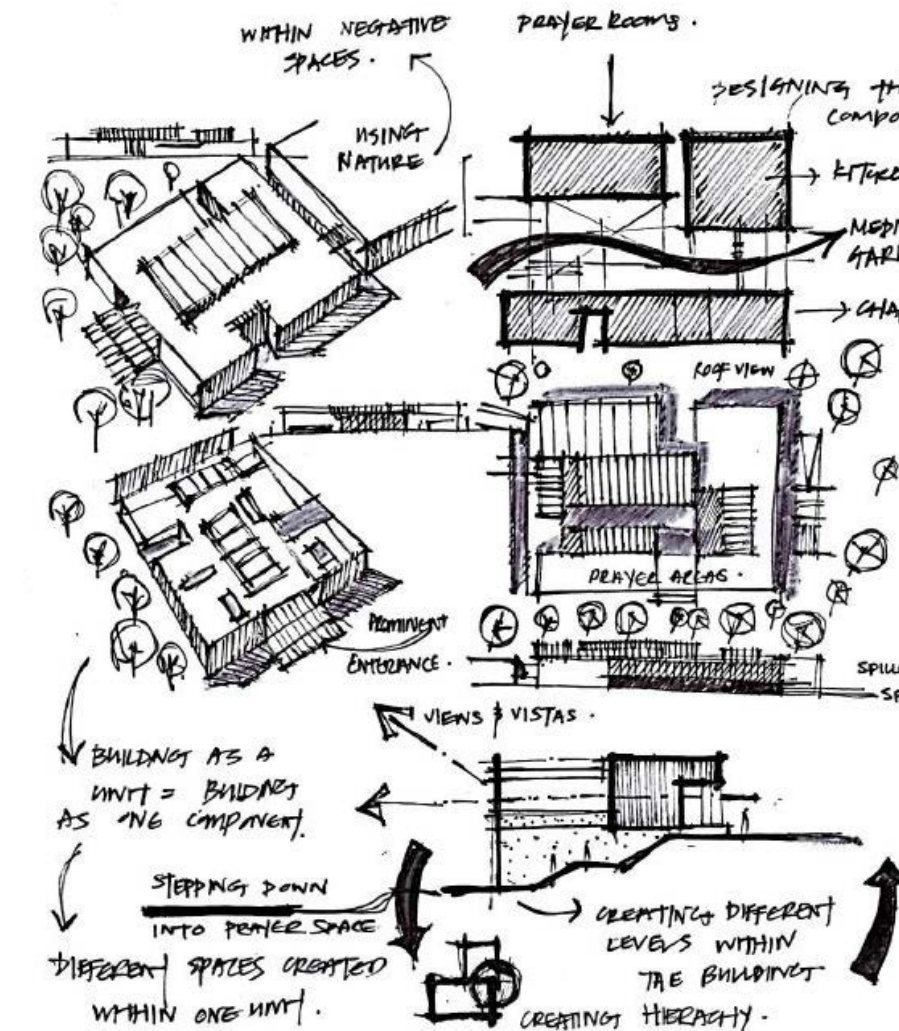


Fig 7.3: Conceptual Diagrams



CURRENT CONDITIONS ON SITE

The current fragmentation, dilapidation and scarring found on site highlights the need for a design intervention that will successfully remediate the landscape by becoming an 'Urban Garden' and forming part of the urban visions 'Green Link'.

It is important to note the site's transformation and growth; over time, the landscape has spontaneously (passively) and naturally regenerated itself to the point where new ecological systems and biodiversity have grown and developed, therefore it is imperative to introduce a design approach with a more sensitive architectural response to the landscape in order to preserve the current self-sustaining natural environment, simultaneously healing the landscape.

Regeneration will be achieved through the implementation of conventional low-level technology that includes the plantation of new fauna and flora greening and environmental and sustainable design technologies that incorporate water conservation and preservation, applied to further rehabilitate the new growing ecological conditions and introduce new biodiversity on the site.

Fig 7.4: Site location

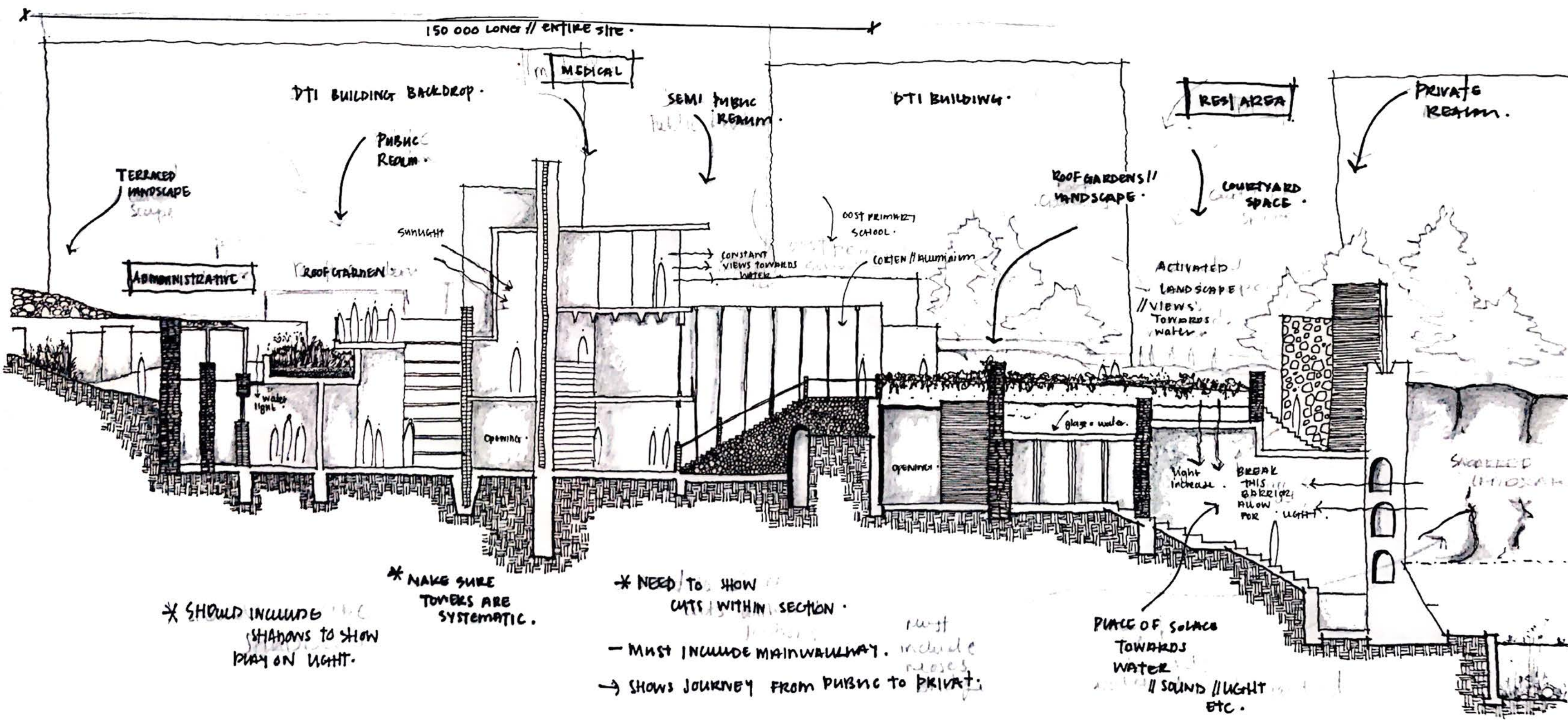
PROGRAMMATIC DRIVERS

Le Guérisseur aims to push the potential of medical science and modern healthcare architecture by offering an efficient yet therapeutic typology; the oncology centre is designed to be poetic, accommodating and welcoming to patients, family and staff.

To achieve efficiency, organisation and proper care, the oncology centre offers PATIENT-CENTRED CARE where patients and their families have direct contact with all staff and specialists. The patient becomes central to the design, their need and their experience become the focal point of the design. The day care centre provides space for the doctor to come to the patient instead of vice versa.

Fig 7.5: Patient Centred Care diagram





* SHOULD INCLUDE SHADOWS TO SHOW PLAY ON LIGHT.

* MAKE SURE TOWERS ARE SYSTEMATIC.

* NEED TO SHOW CUTS WITHIN SECTION.

- MUST INCLUDE MAINWALKWAY. include roses.
 → SHOWS JOURNEY FROM PUBLIC TO PRIVATE.

DESIGN DEVELOPMENT

The design development went through four distinctive iterations throughout the year.

Fig 7.6: Design Development Section

PRECEDENT:

FREEDOM PARK

Freedom Park, designed by Mashabane Rose in 2004, is a prime example of how the natural qualities and analogues of nature can be translated into architectural form to create a sense of place and a healing environment. The park was designed to become a national symbol for reparation, a symbol of healing, a symbol of cleansing and freedom for South Africa. This mediation was portrayed through the design and integration of architecture and landscape; the building sits romantically on Salvokop's hilly landscape with undulating rock walls, boulders and water gardens used to establish an architectural language (Crous, 2016).

"The boulders are planted at the base of the Salvokop hill like a rock outcrop. With walls and roof all clad in copper sheeting, the 'outcrop' will, with time, rust to green and merge with the natural landscape... The interior spaces of the museum are designed with a cave-like quality with natural light used to dramatize the large volumes and 'outcrop' forms of the buildings" (ArchDaily, 2019).

The design sought to not only create symbolic representations of nature through the architecture, but also used the duality that exists between the two to highlight their aesthetics, therapeutic qualities respectively and combined to create a new sense of place.



Fig 7.7: Freedom Park

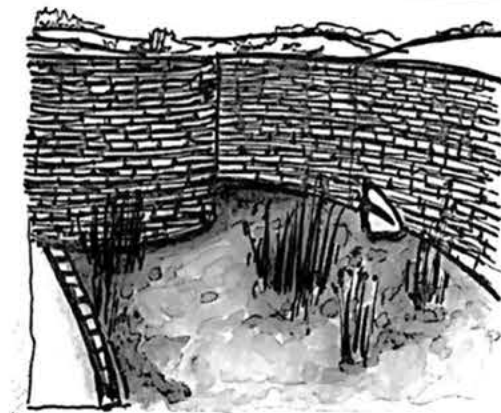
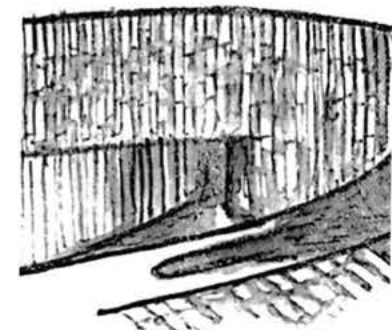
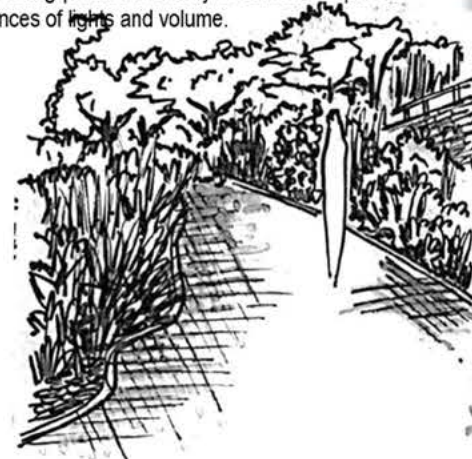
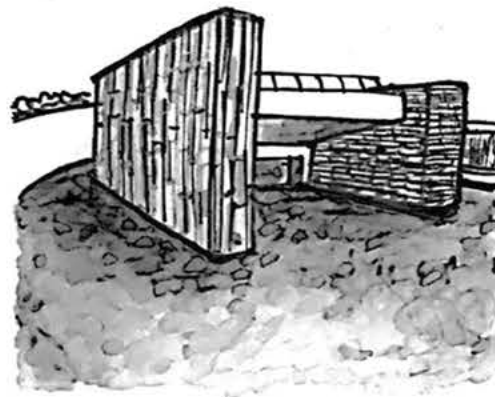
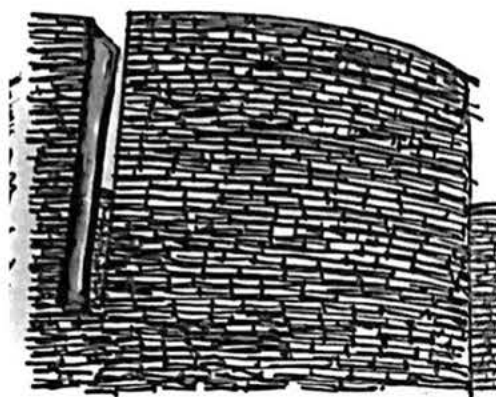
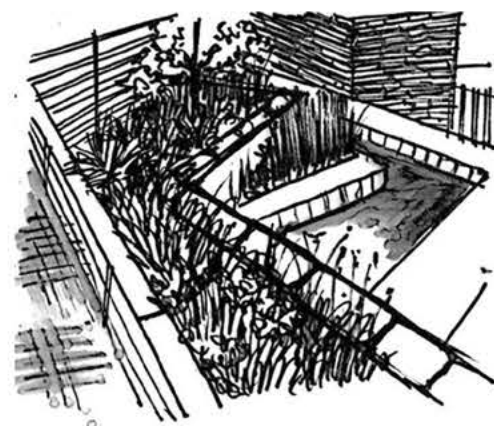
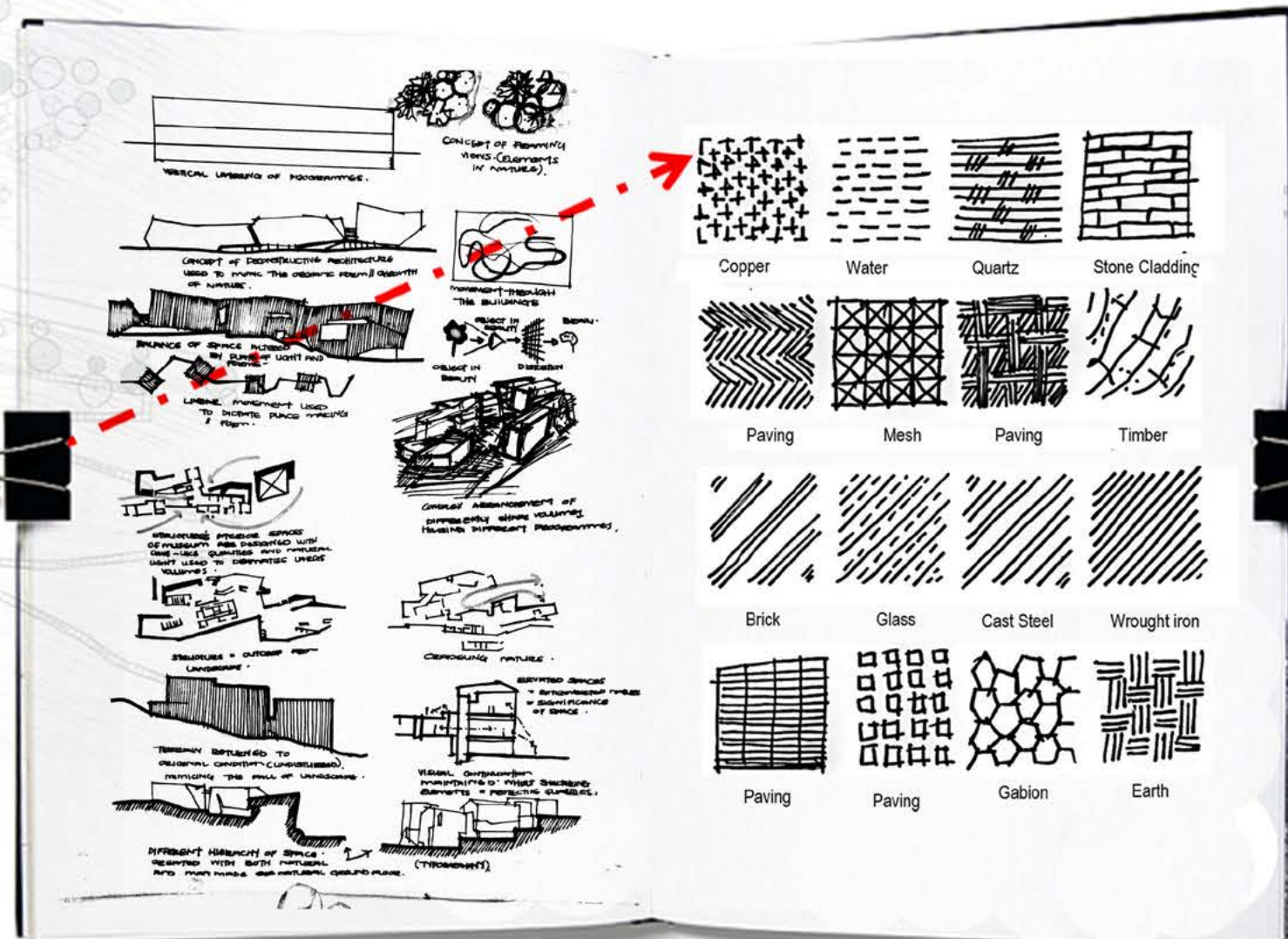
copper cladding was selected in spite of it being a complicated, expensive material.

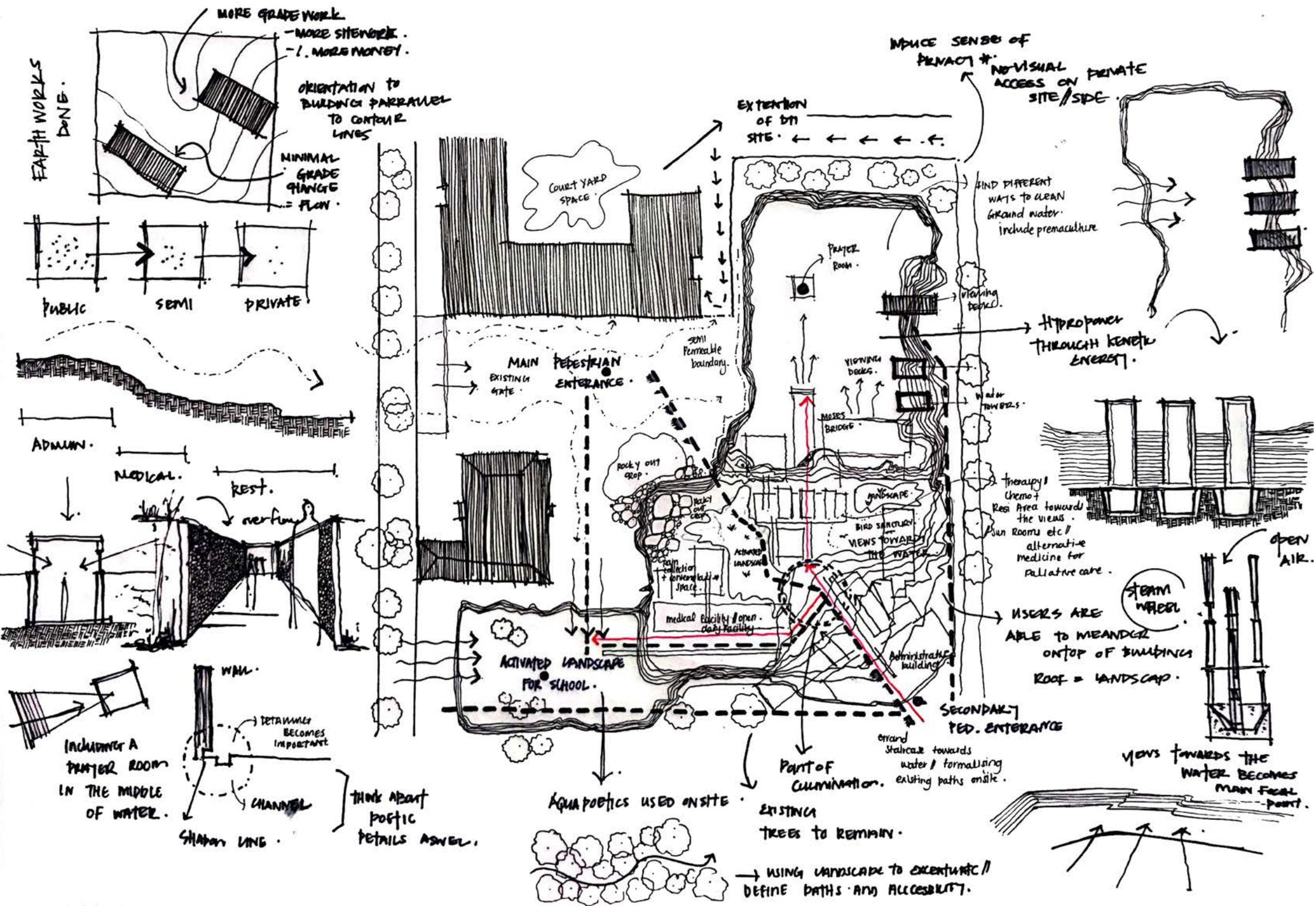
The //Hapo Museum building components were designed as a series of abstract 'boulders' clad in copper. The copper clad blocks mimic the ancient boulders that completed the hillsides and are arranged in an organic cluster across the landscape

Building does not compete with the landscape, rather it sits romantically within it.

Over time the surface will develop a transformative and earthbound patina.

Spatially the series of abstracted boulders rise out of a gently landscaped plaza, breach, break, curve and fold into deep, dim fissures. These complex irregularities mimic an ancient landscape and in so doing provide a variety of exhibition spaces delineated by differences of light and volume.





ITERATION 1.1

APRIL

The building is designed at the top of the site on ground level and organically moves with the landscape, terracing with the contours towards the water at the end of the site. The Architecture of the oncology centre is designed in human-scaled building clusters that are designed and informed by the natural qualities found on site; the organisation and form of the buildings are designed around existing natural conditions and existing vegetation, therefore having minimal damage or further extraction of the site. Furthermore, existing foot paths are formalised and used to create walkways that connect the organic building clusters together.

Fig 7.11: Iteration 1.1 schematic design development and conceptual diagrams.

MAQUETTE EXPLORATION

Iteration 1.1 explored the spatial organisation, formation, hierarchy and movement of the building clusters by creating and a new architectural language that physically merged building and nature, therefore creating a balance between the stereotomic and tectonic design development.

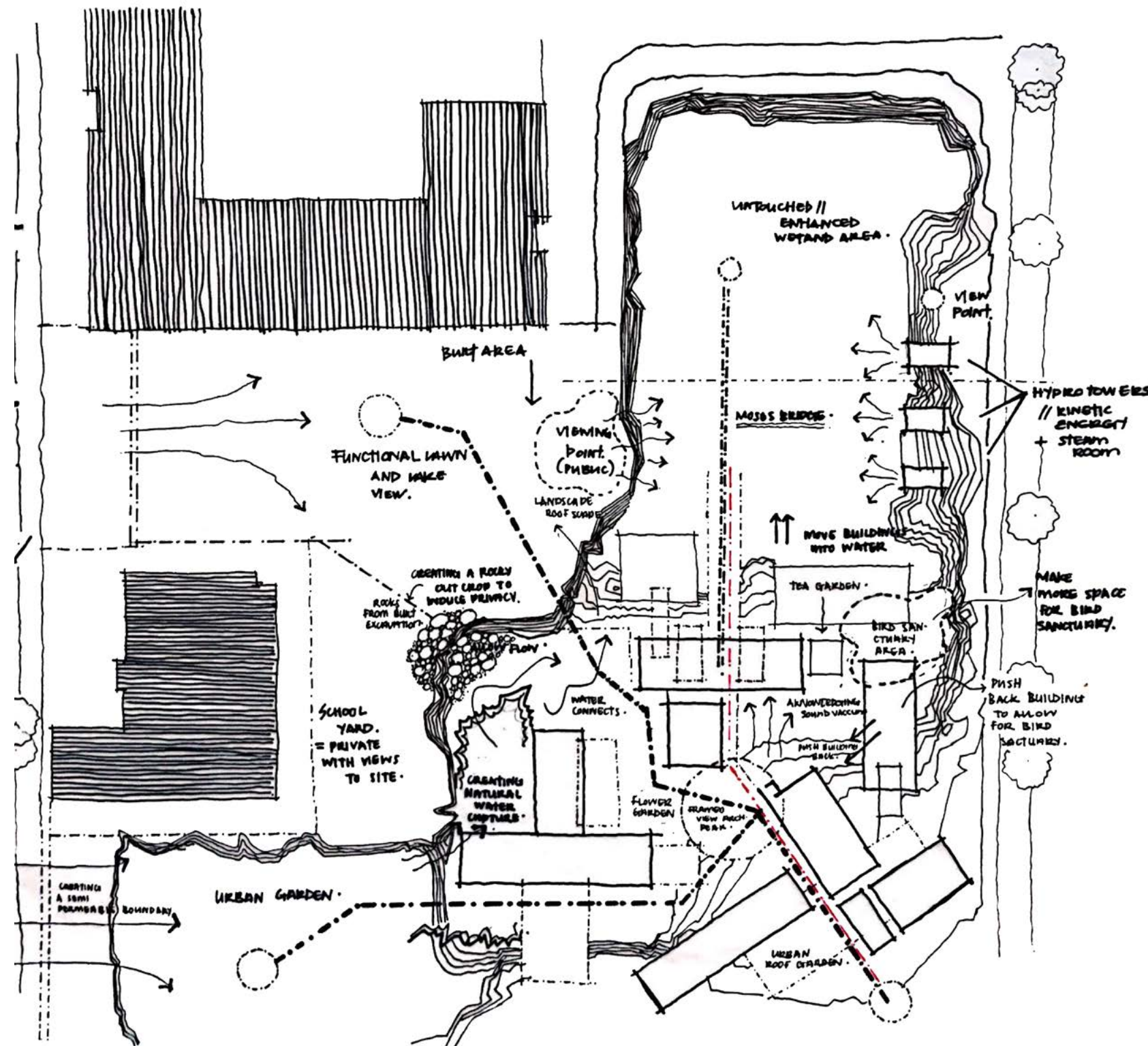
Critique: The building takes up a lot of the landscape. There should be more unbuilt than built to preserve the natural essence of the site.



Fig 7.12: Iteration 1.1 Maquette view A



Fig 7.13: Iteration 1.1 Maquette view B



ITERATION 1.2

MAY 2019

Due to the steep terracing of the site, the design intends to connect the buildings on the ground floor by introducing "Sky walks"; users can meander along rooftop terraces with views towards the water.

Different levels of privacy are created through the programmatic zoning of the facility;

Public administrative buildings are at the top of the site, welcoming patients and providing them with the necessary information before they are ushered to a semiprivate medical block, located in the south western edge of the site, where day visitors can receive treatment. In-patients are then led to the bottom of the site to their private patient housing area with facing the man-made wetland.

The 3 clusters are designed around interactive landscape environments such as a bird sanctuary, healing gardens, contemplative rest spaces and herbal gardens. These interactive landscapes are designed to encourage patients, visitors and staff member to immerse themselves with the natural environment, therefore benefitting from the healing qualities of nature.

Fig 7.14: Iteration 1.2 schematic design development

CONCEPTUAL DIAGRAMS

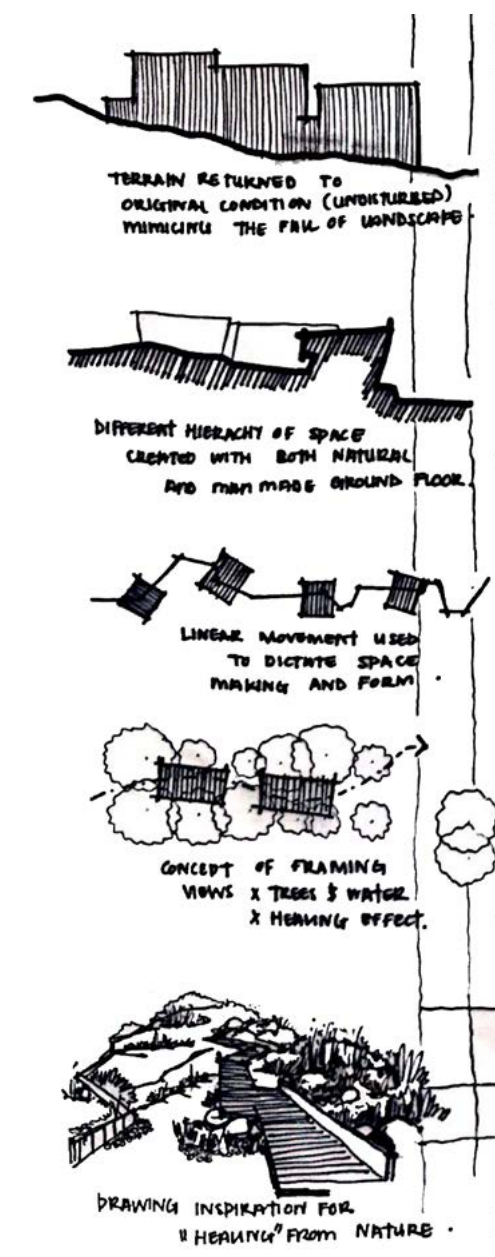


Fig 7.15: Iteration 1.2 conceptual diagram

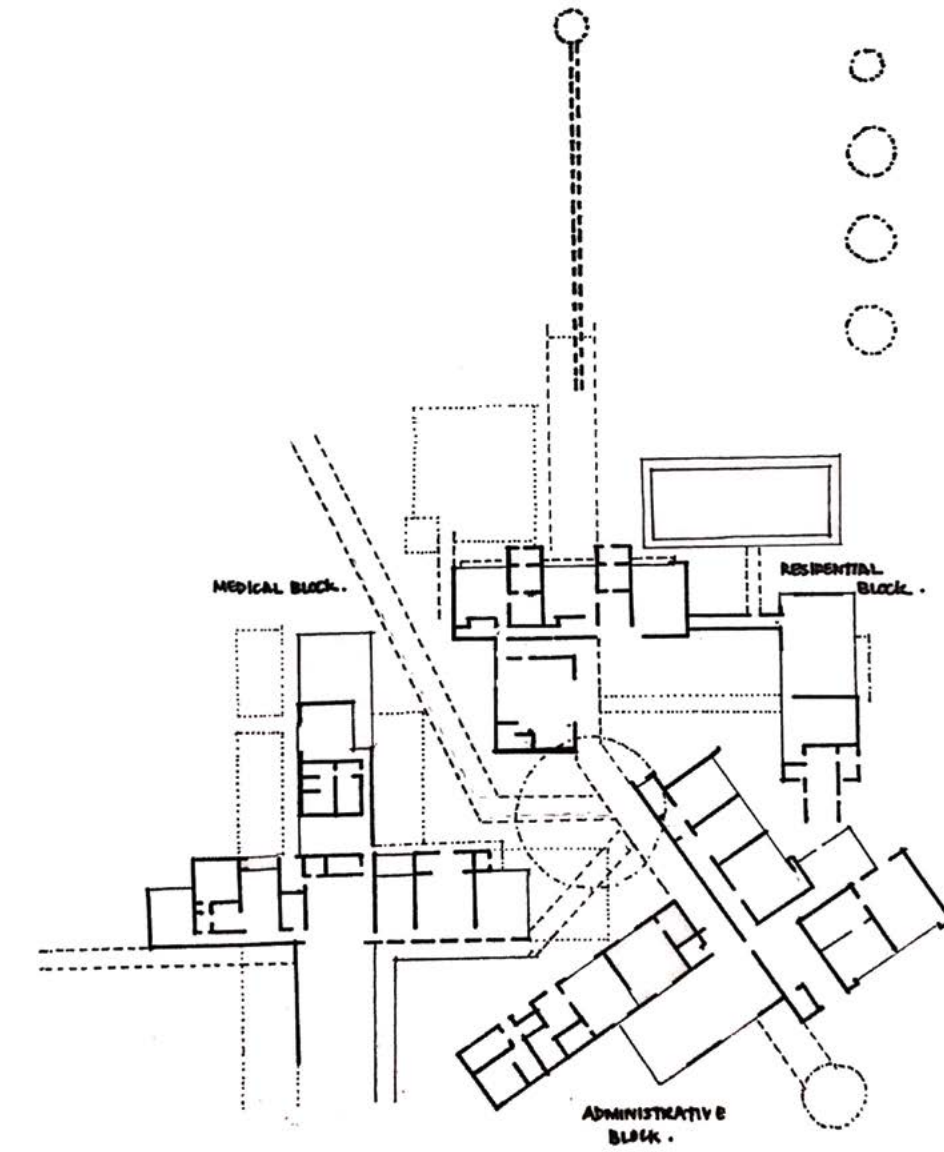


Fig 7.16: Iteration 1.2 floor plan development

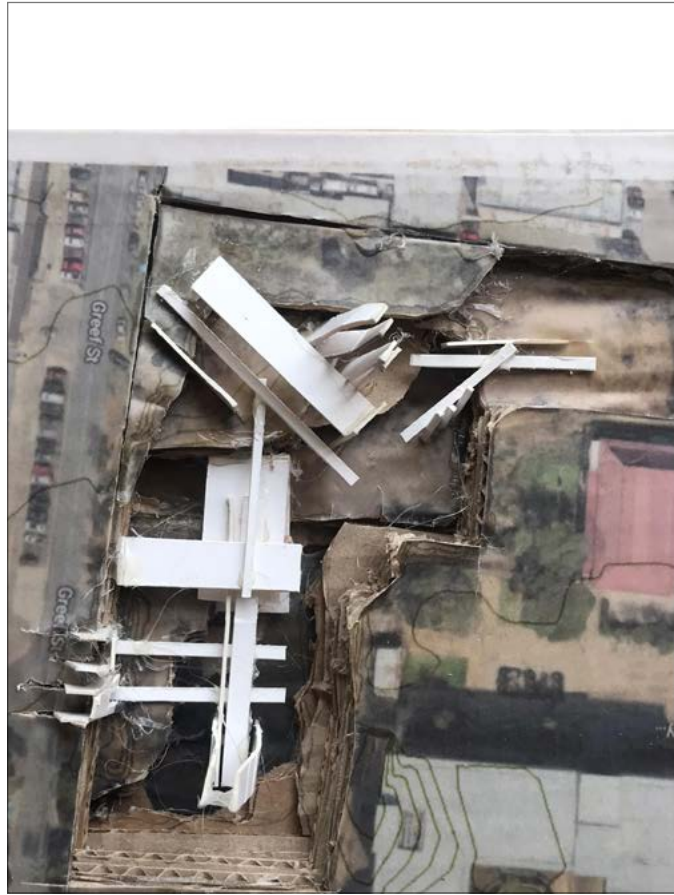


Fig 7.17: Iteration 1.6 Maquette exploration

MAQUETTE EXPLORATION

Iteration 1.2 explored building heights as the appropriate response to the surrounding buildings fabric and context. Due to the terracing of the site, the building starts to submerge itself below ground level and therefore cannot properly create visual links or physical connections to the adjacent buildings. Therefore, through the design of programmatic towers, the form of the oncology centre was manipulated in height to respond to the context.

Critique:

The addition of towers lacked the significant and necessary contextual response. Importance should be placed on the bulk of the clustered buildings, the need to be elevated. Landscape is still too big for the design, a block study needs to properly be developed. However, stronger architectural language created; there's a balance established between the stereotomic mass of the landscape and the tectonic design of the architecture.

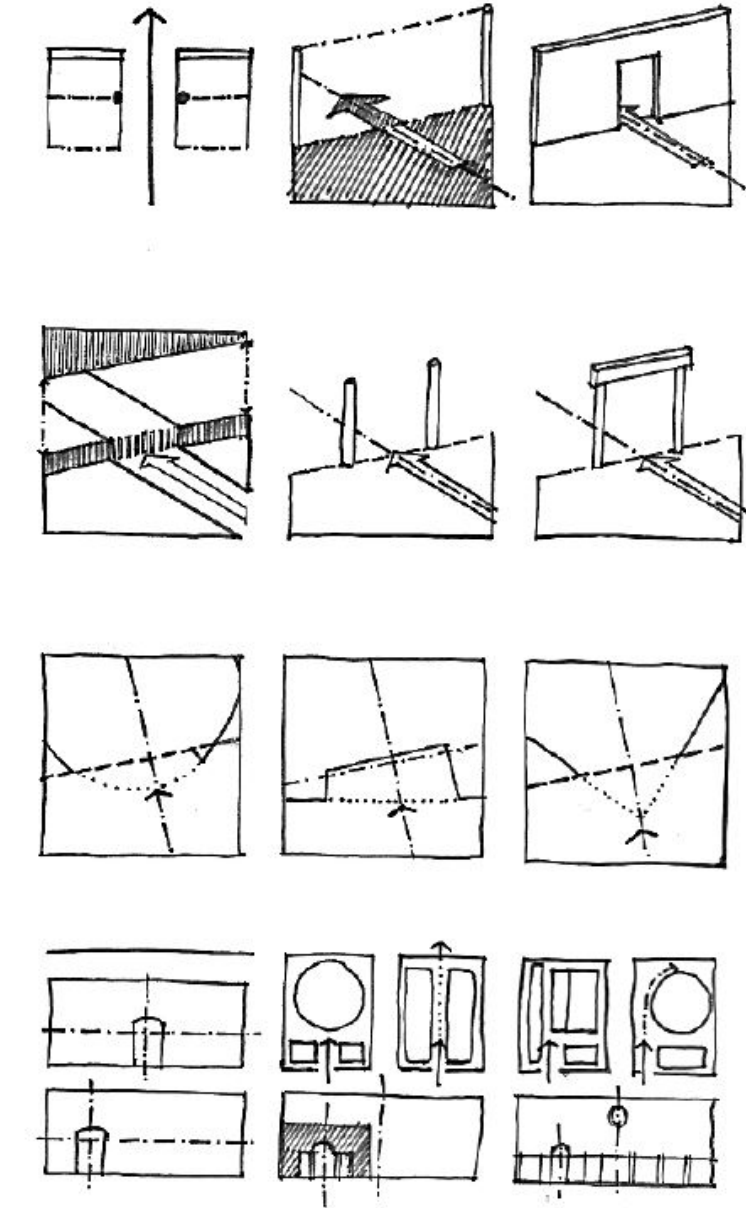


Fig 7.18: Ching Diagrams exploring spatial movement and threshold (Ching, 1979)

ITERATION 1.3

JUNE 2019

Iteration 1.3 focused on formalising the spatial arrangement of programmes and creating the tangible and intangible links to the landscape. The building was designed to extend as far out to be nestled in all parts of the site.

Critique:

The building is too big, lacks sense of control. There are too many programmes, they should be narrowed down to essential necessities.

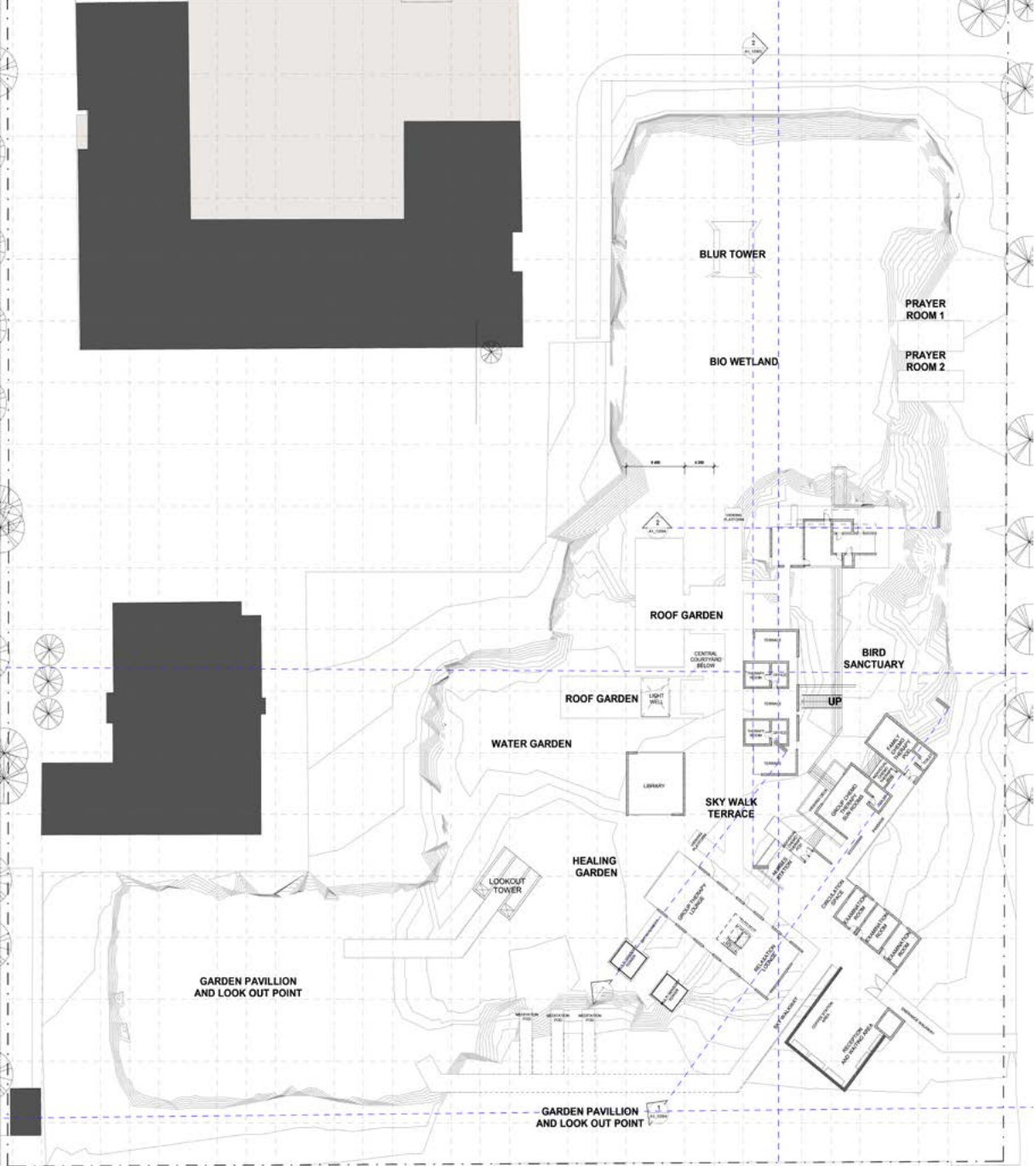
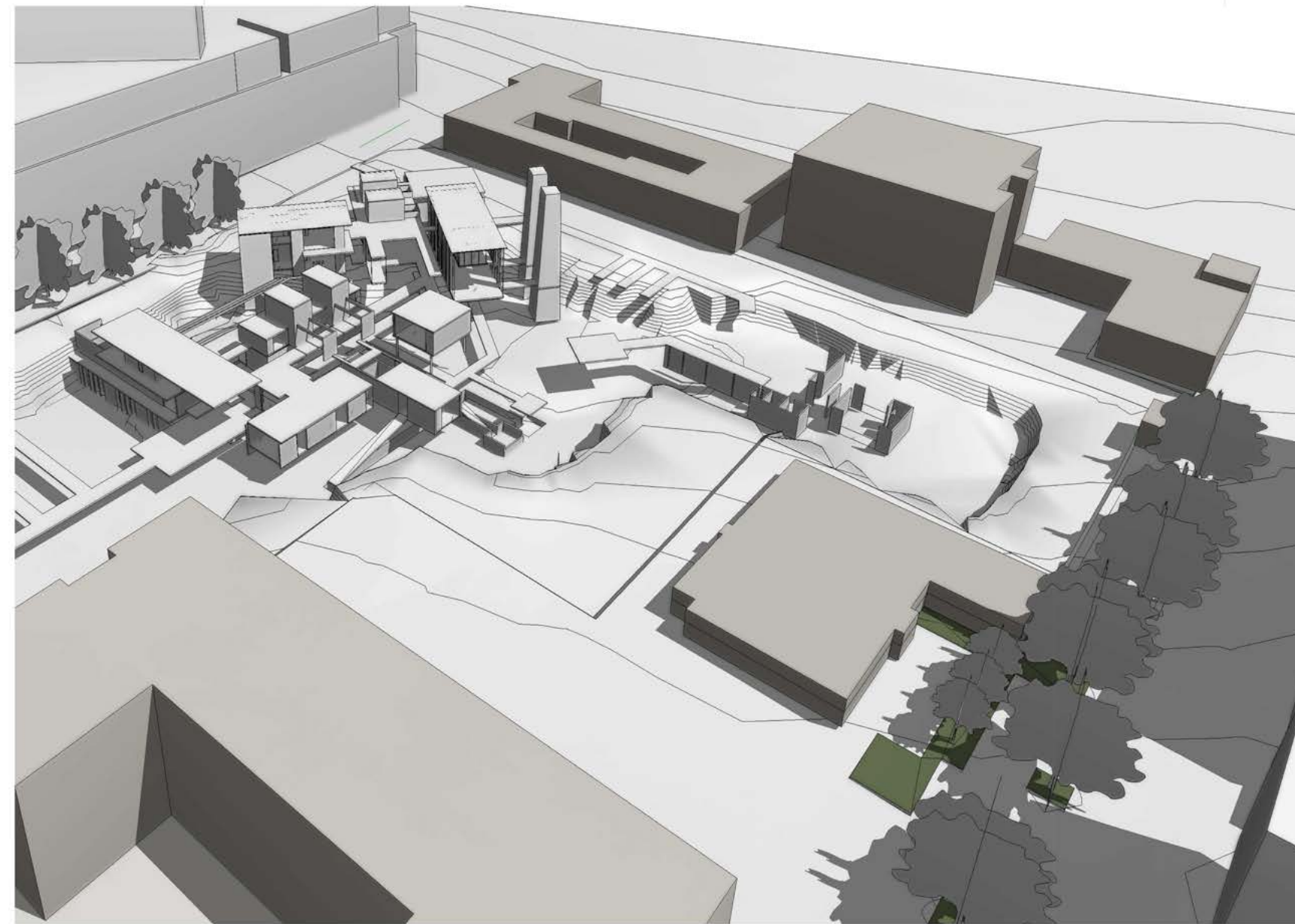


Fig 7.18: Iteration 1.3 Ground floor plan



Fig 7.19: Iteration 1.3 First floor plan



REVIT MODEL EXPLORATIONS Fig 7.20: Iteration 1.3 Maquettes explorations

ITERATION 1.3

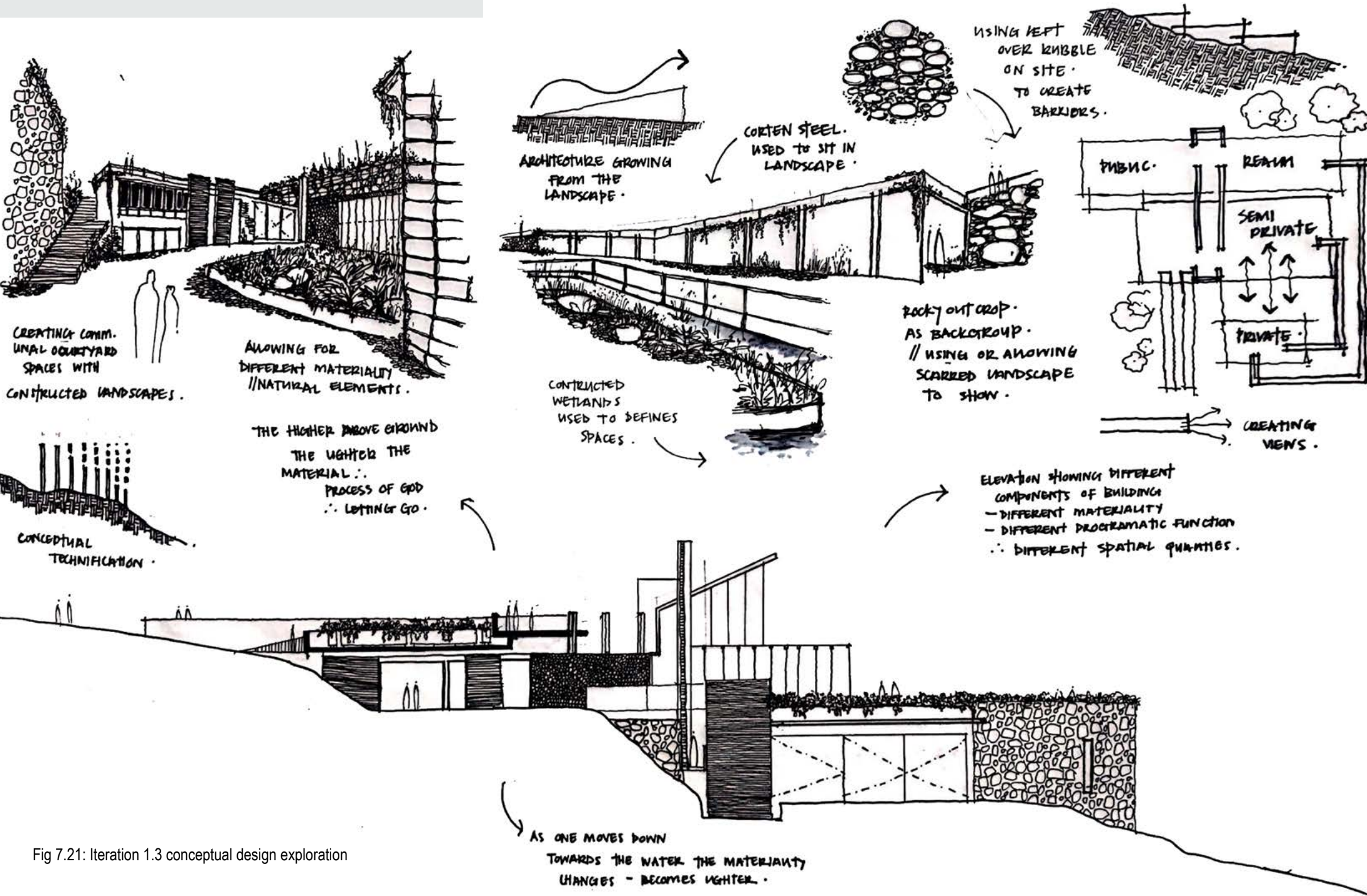
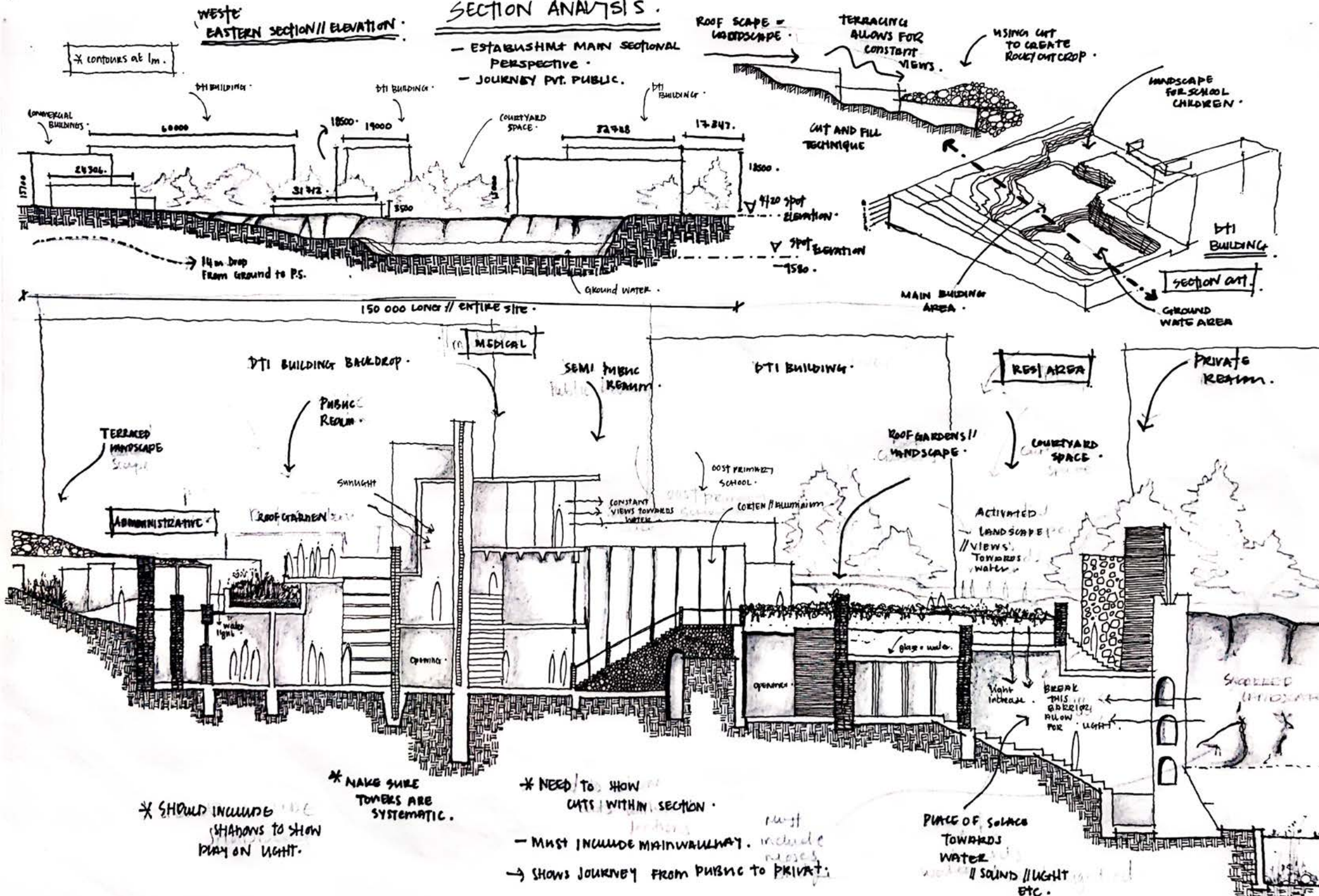


Fig 7.21: Iteration 1.3 conceptual design exploration



ITERATION 2. FLOATING ON THE WATER

The oncology centre was designed and positioned to sit romantically in the middle of the landscape, responding to the terracing of the site, seamlessly integrating with the surroundings and creating a fluid transition between architecture and landscape. The new building was designed much smaller with the intent to create a private and linear perceptive journey towards the water. The building sits on the edge of the landscape and cantilevers over the water.

Fig 7.22: Iteration 2.1



MODEL EXPLORATIONS

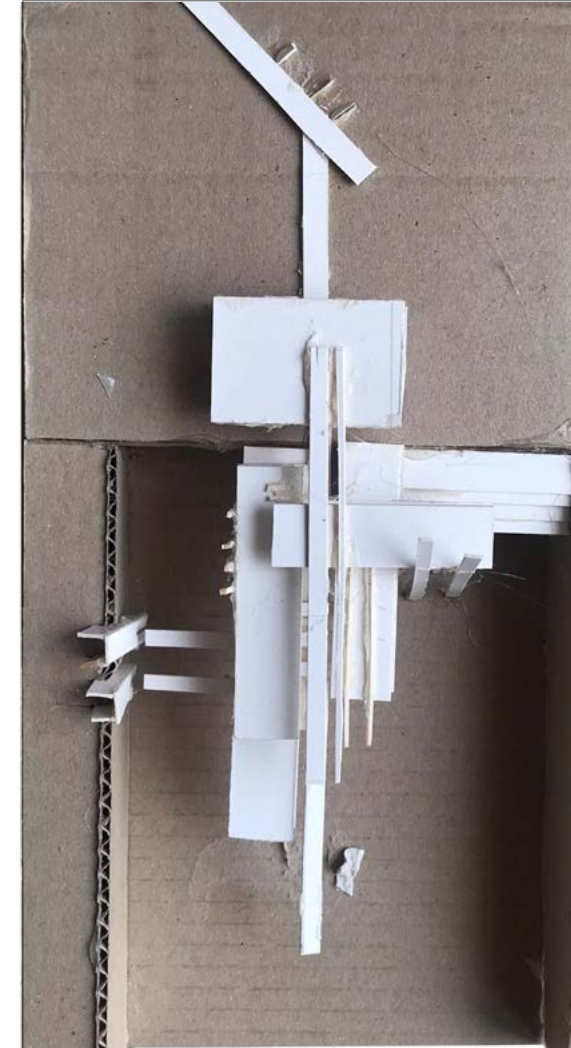
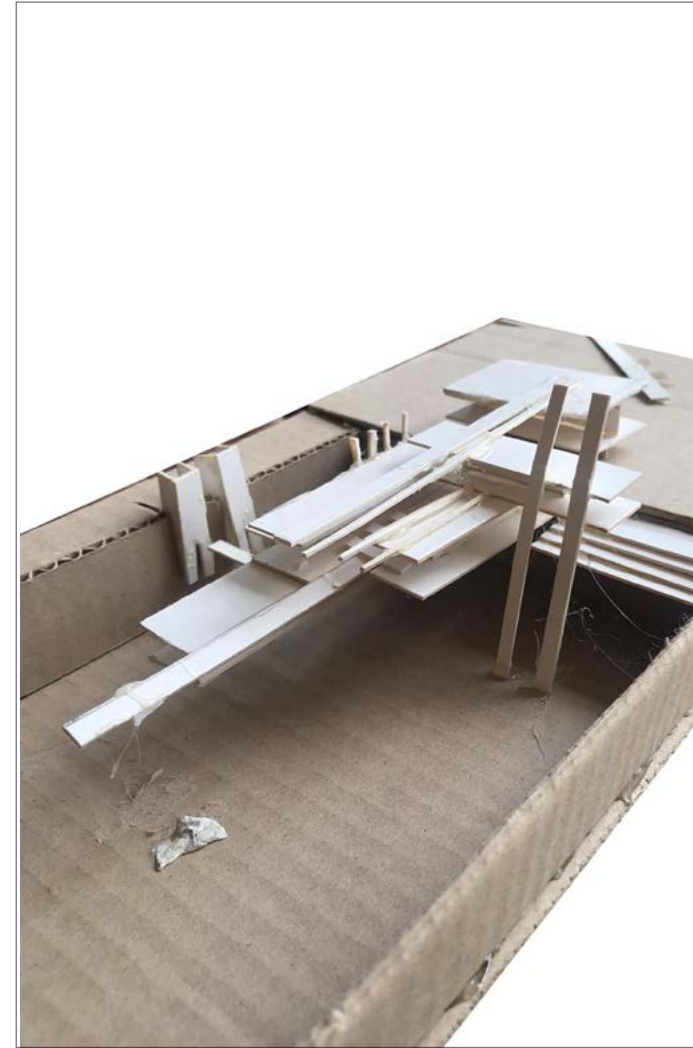


Fig 7.23: Iteration 2.1. Model Exploration

CONCEPTUAL DESIGN EXPLORATION

MAQUETTE EXPLORATION

Iteration 2.1 focused on creating a seamless building that would house all the functions of the oncology centre and sit romantically not only in the landscape but also on the water. The intent was to create an architectural language that would reinforce the tectonics of the building allowing it to become the central focus of the site creating a strong liner form that contrasts but also compliments the existing natural surroundings.

Critique: The building seems to be detached from the landscape; spaces are designed functionally therefore influencing a form that lacked the necessary connection with the landscape.

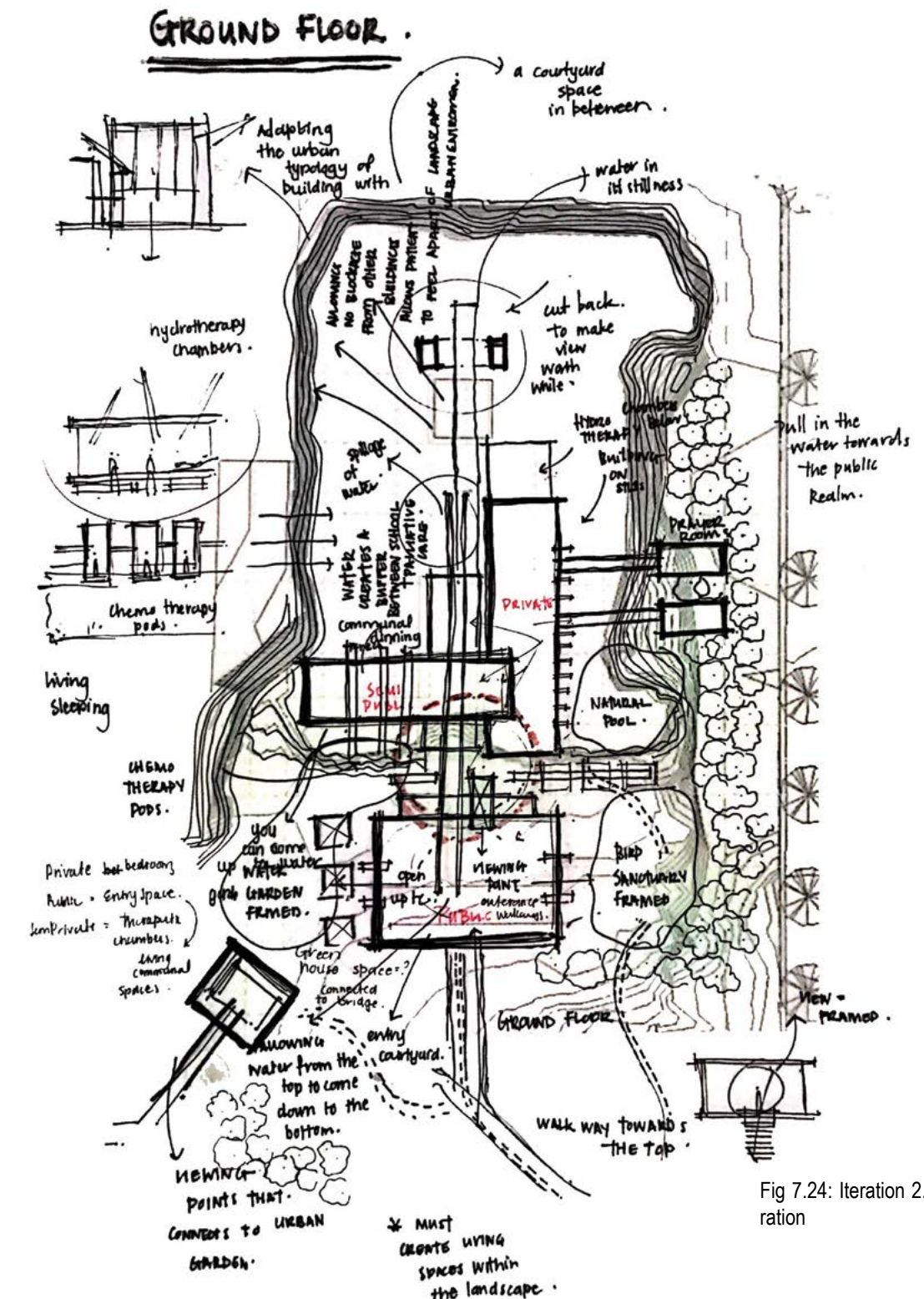


Fig 7.24: Iteration 2.1. Conceptual spatial exploration

BASEMENT FLOOR



Fig 7.26: Iteration 2.1 Basement Floor.

GROUND FLOOR



Fig 7.27 Iteration 2.1 Ground Floor.

FIRST FLOOR

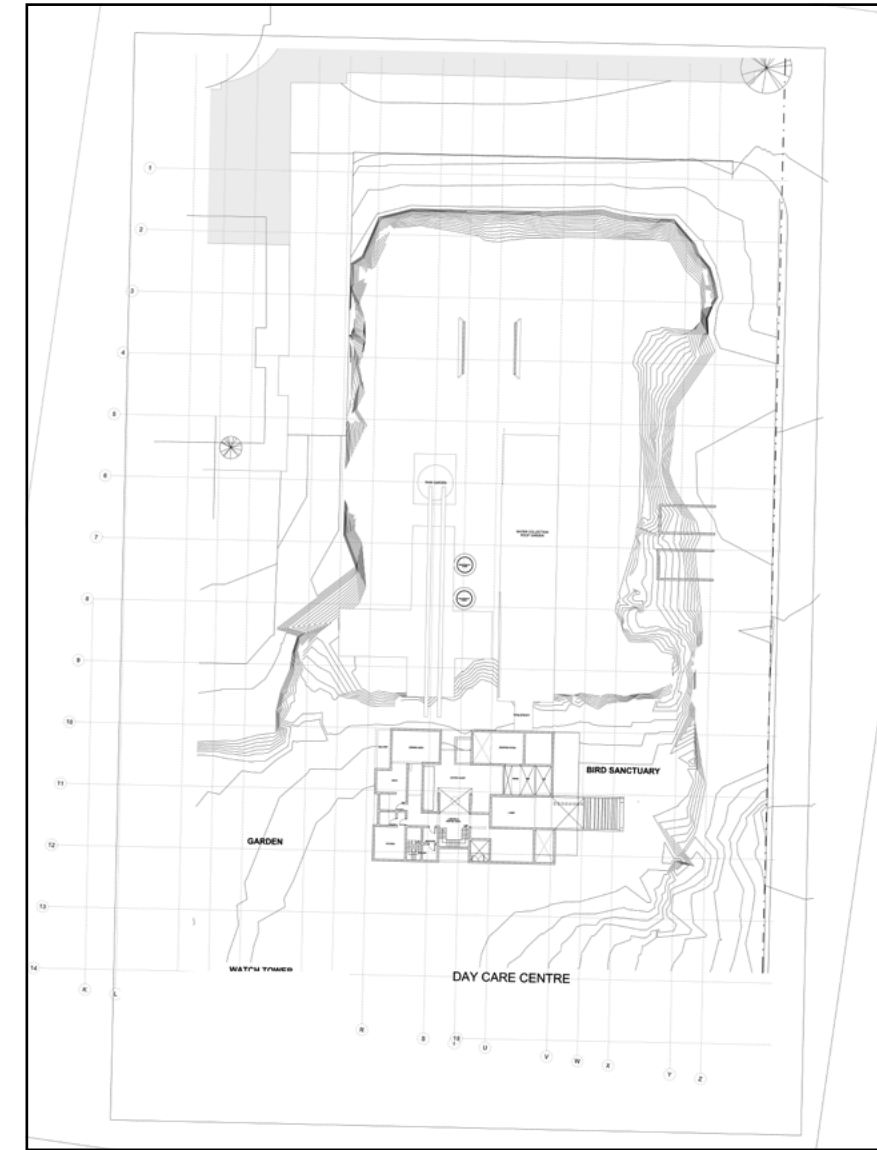


Fig 7.28: Iteration 2.1 First Floor.

There was an attempt to articulate the design more clearly by removing the idea of clusters and integrating all the administration, treatments and in-patient suites into one building. The administrative building sits as a public building block from which the semi-private medical treatment day care facility and the private in-patient bedroom suites could stem from.

There was an attempt to articulate the design more clearly by removing the idea of clusters and integrating all the administration, treatments and in-patient suites into one building. The administrative building sits as a public building block from which the semi-private medical treatment day care facility and the private in-patient bedroom suites could stem from.

The ground floor was designed as a public interface that would accommodate and allow day and in-patients to socialise amongst themselves and with their families. The first floor was designed as a private healing spaces that accommodated various healing typologies, conservative, alternate and experimental. Furthermore, the basement was designed not only to accommodate building services such as water conservation, filtration and preservation but also because it was submerged in the water, it was designed to introduce

hydrotherapy as an alternative treatment in the oncology centre.

These three building were connected by a pedestrian bridge that extended further out onto the water and led patients to two private prayer rooms, located on the eastern edge of the site and a fog tower that pulled the users into the middle of the wetland to experience an independent sensorial journey of reflection and contemplation through isolation. The medical treatment rooms were placed on the western edge of the site with the in-patient suites on the eastern edge. Patient suites were designed with shared balcony terraces that would allow for the eastern light to filtrate into their bedrooms with a direct link to the prayer rooms.

Critique: The building does not interact enough with the site. By separating the buildings into three compartments not enough integration and fluid movement required for the programmatic intention of the project. Not enough attention and consideration is placed on the patient.

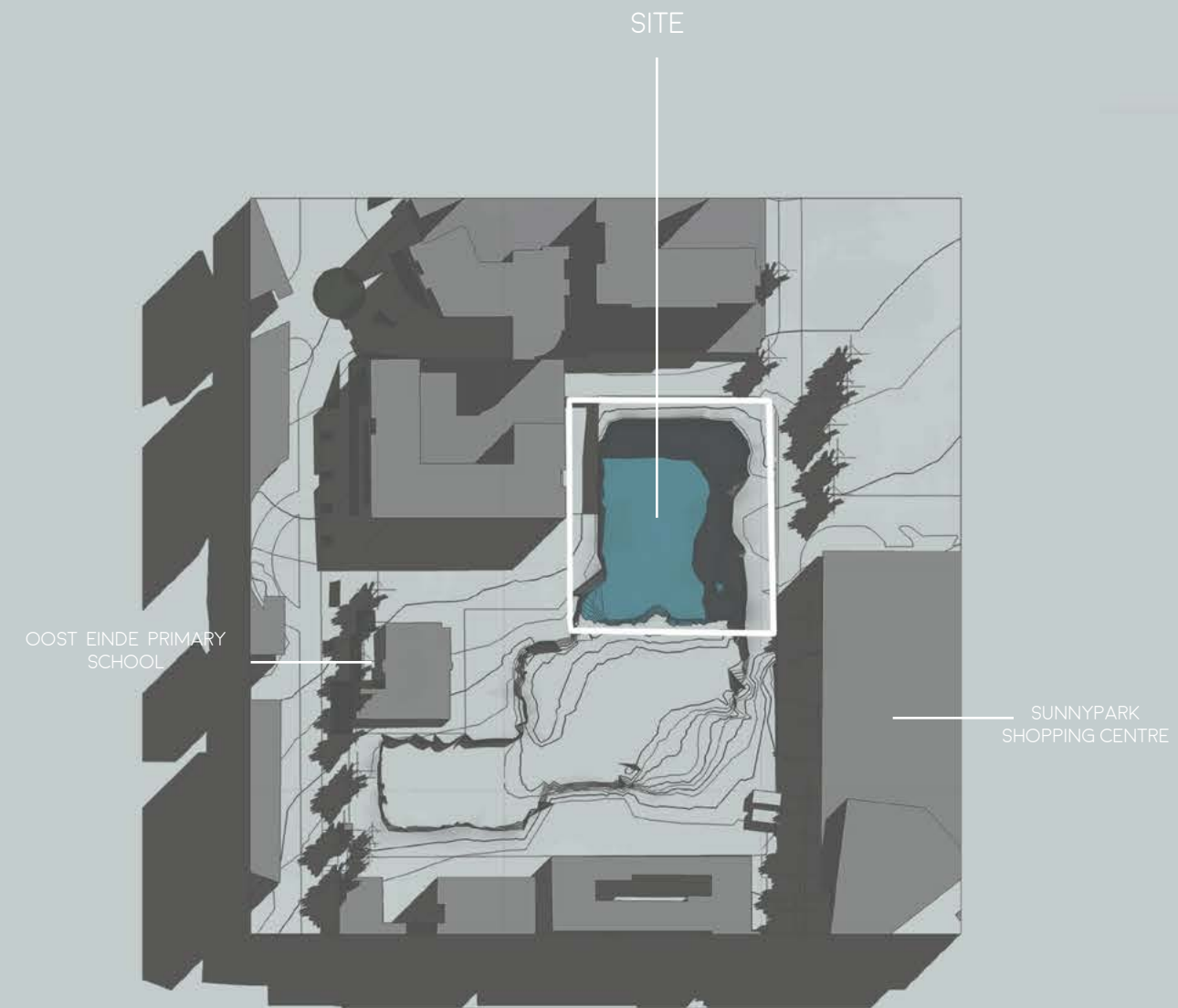
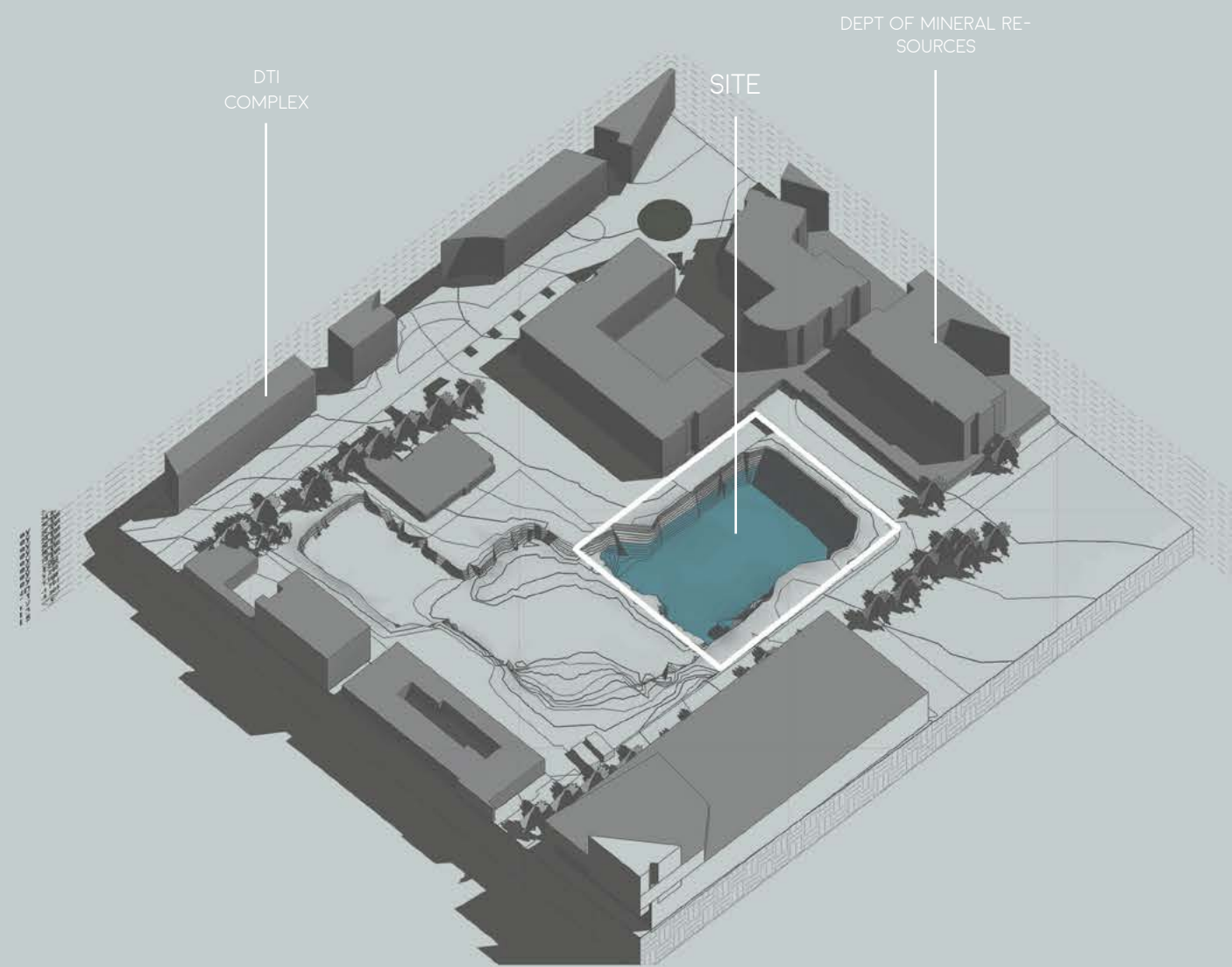
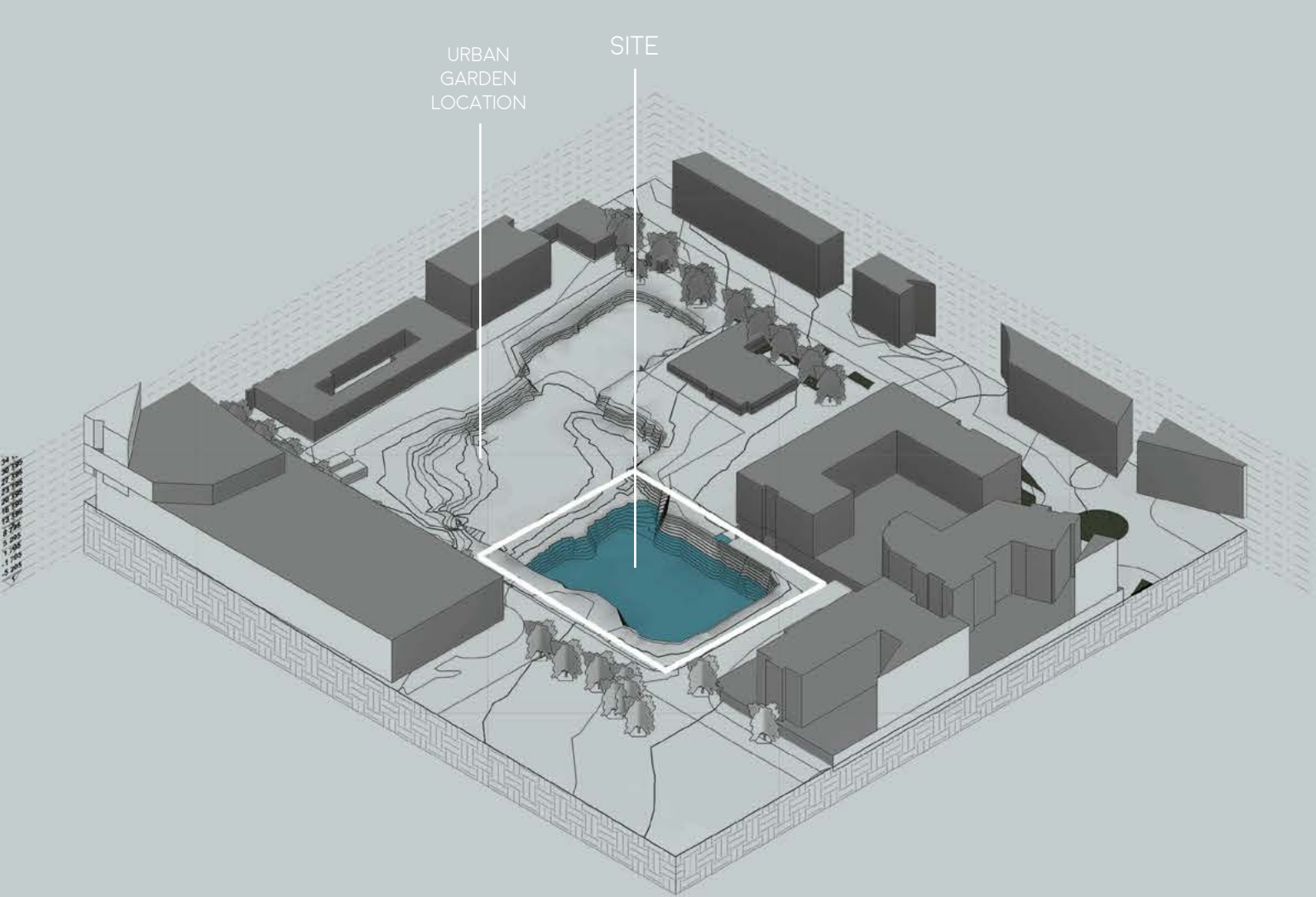


Fig 7.30: Iteration 3.1 New building location .

ITERATION 3.1

Through Iteration 3.1 the shift and focus of the design becomes the ground water and how it can be used to define the architecture form, function and spatial qualities and treatment of the oncology centre. Therefore, the centre is designed and positioned on the northern part of the site, around the edges of the water body caressing it and protecting it and facing the urban garden.

This change in the design aimed at creating visual, physical and emotional links between architecture and landscape with water acting as the mediator between the two, creating a fluid transition between architecture and landscape and therefore seamlessly integrating the patients back into the natural environment where they can inherently and spontaneously benefit from the healing qualities of nature.

The new building is informed by the natural qualities found on site;

1. The architecture of the project aims to preserve the existing natural elements such as

trees, prominent fauna and flora and specifically the man-made wetland found on site, because of this, the building is designed around the edge of the water body, preserving it and allowing it to become the focal point of the design, therefore emphasising the healing qualities of water.

2. Due to the steep terracing of the site, as one descends towards the water, the landscape starts to create a sound vacuum; urban noises, such as traffic, slowly diminishes till it is no longer heard at the edge of the water. This natural sound vacuum spontaneously aids in the acoustic design of the oncology centre; as users' journey through the landscape of the Urban Garden and move through the centre, they will be engulfed with the peaceful sounds of the natural environment i.e. birds chirping, crickets stridulating and the tranquil sound of water movement.

3. Existing pathways towards the bottom of the site are formalised to create walkways that lead to a pedestrian bridge that connects the oncology centre with the rest of the Urban Garden.

4. Birds flock towards the north eastern edge of the site therefore a bird sanctuary is designed around this area to protect their ecological biodiversity. The bird sanctuary is located along the pedestrian bridge with a viewing deck that allows for bird watching before entering the centre.

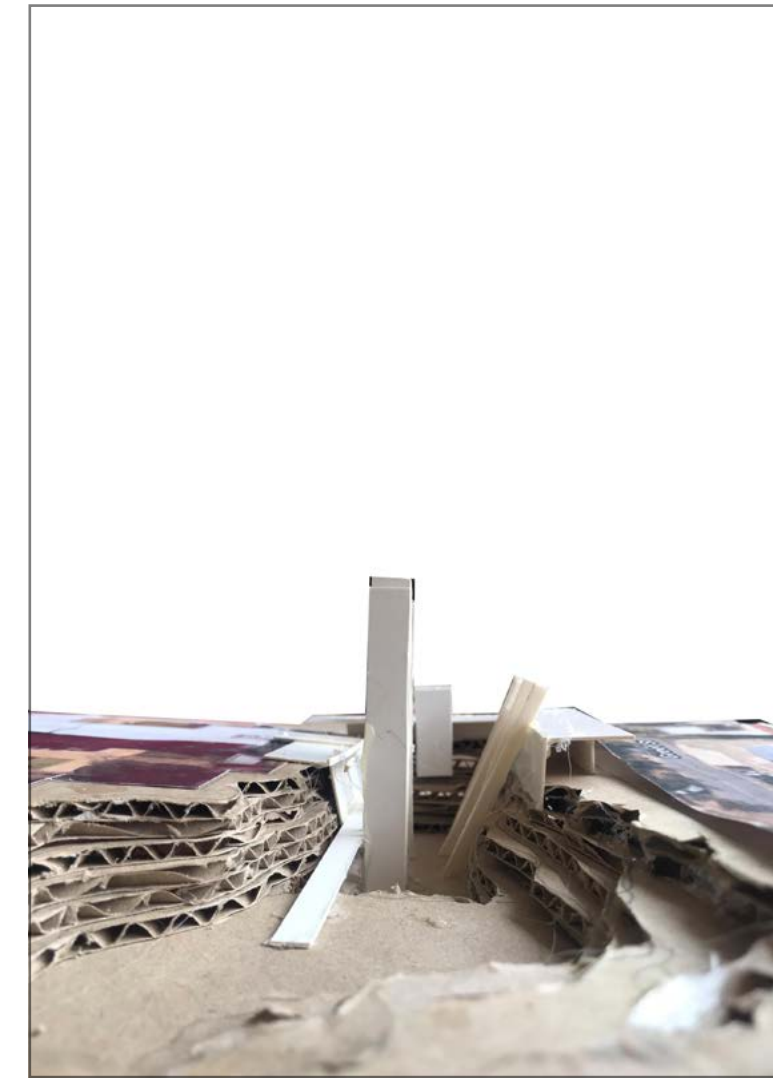


Fig 7.31: Iteration 3.1 Maquette exploration

ITERATION 3.2.1



Fig 7.33: Iteration 3.2.1 Ground Floor

ITERATION 3.2.2

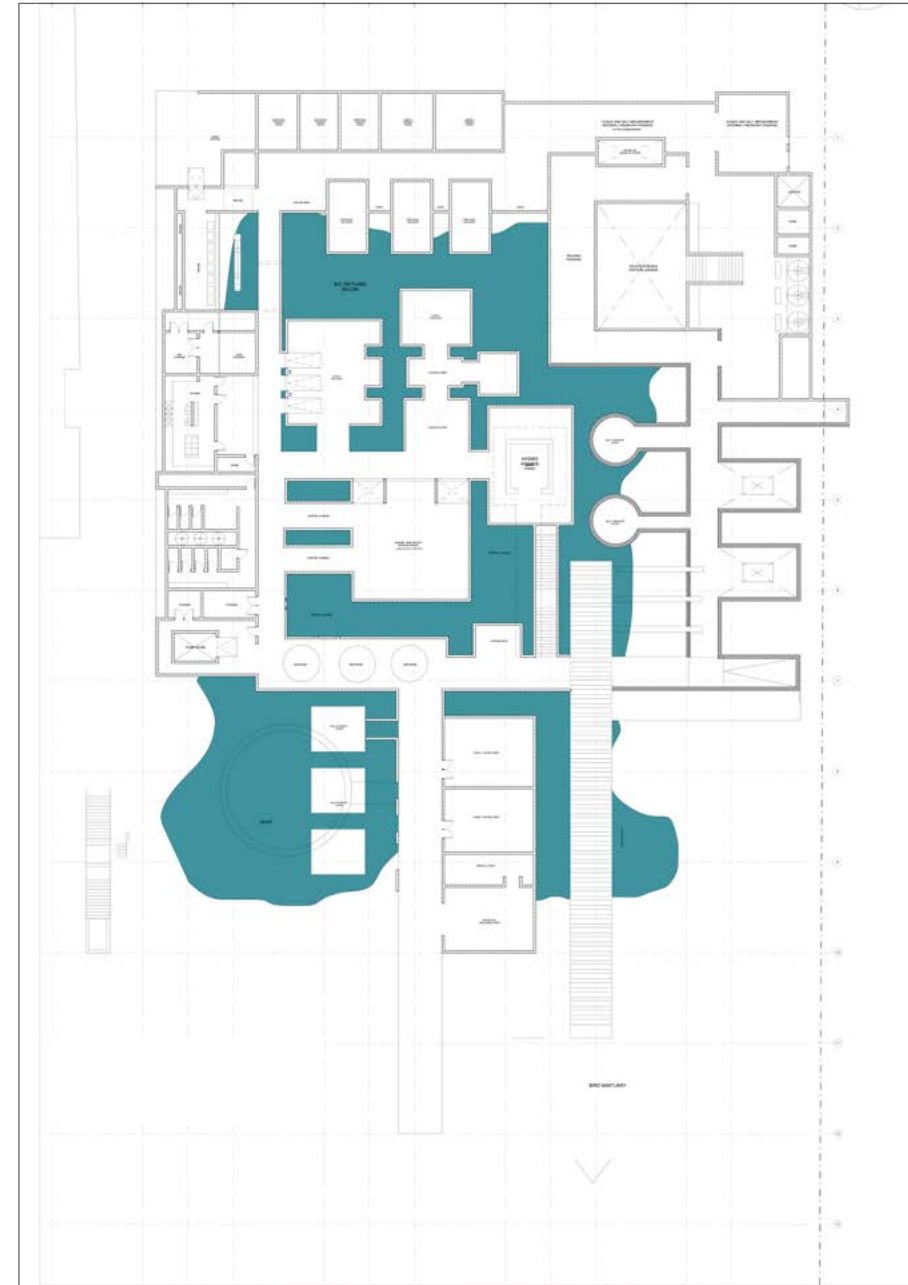


Fig 7.34: Iteration 3.2.2 Ground Floor

ITERATION 3.2.3

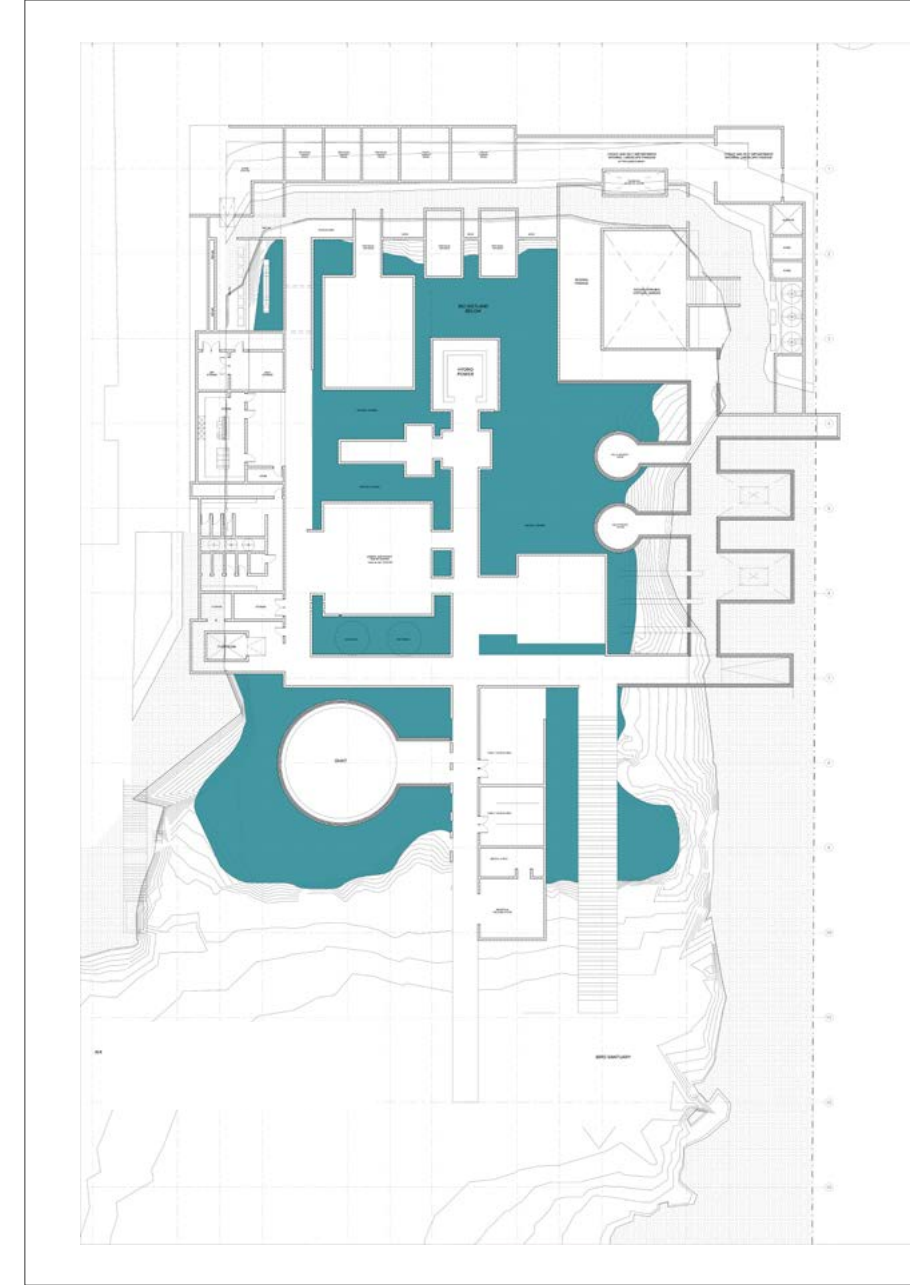


Fig 7.35: Iteration 3.2.3 Ground Floor

ITERATION 3.2

Iterations 3.2.1, 3.2.2 and 3.2.3 explored the spatial organisation and implications of a closed loop design with one entrance and exist to the oncology centre on the southern edge of the site. Patients, visitors and staff journey from the Urban Garden along the walkway that connects them to a reception area and family waiting room where consultation, medical checks and blood work rooms are located. The walkway is also linked to heliotherapy towers on the left-hand side.

A café, ablutions, staff room and other medical services are placed on the western edge of the site and all linked to a service street that is easily accessible for deliveries and ambulance. Semiprivate healing garden, nurse stations and various treatment rooms, whether it be conservative, alternative or experimental treatments, were all placed in the middle of the design, connected by 'floating' walkways.

Private individual, group and family therapy rooms were placed on the northern edge of

the site with framed views and vistas of both the water and external landscape, facing the southern sun. The library, reading rooms, music rooms, wellness facilities and research and information workshops were designed on the eastern side of the site, benefiting from the eastern sun and linking back to the street edge as public functions.

All three designs were iterated to find the proper spatial organisation of the programmatic functions on the oncology centre and to find the most suitable balance between building, water and landscape.

Critique: Better spatial and programmatic connections were made. Relationship between water, building and landscape is balanced and allows for an integrative, interactive and sensorial experience for all users. The building is starting to take form, however, the central water body needs to be freed up and framed better by the internal building leaf.

MAQUETTES EXPLORATION



Fig 7.32: Iteration 3.1.2 Maquette exploration

ITERATION 3.3

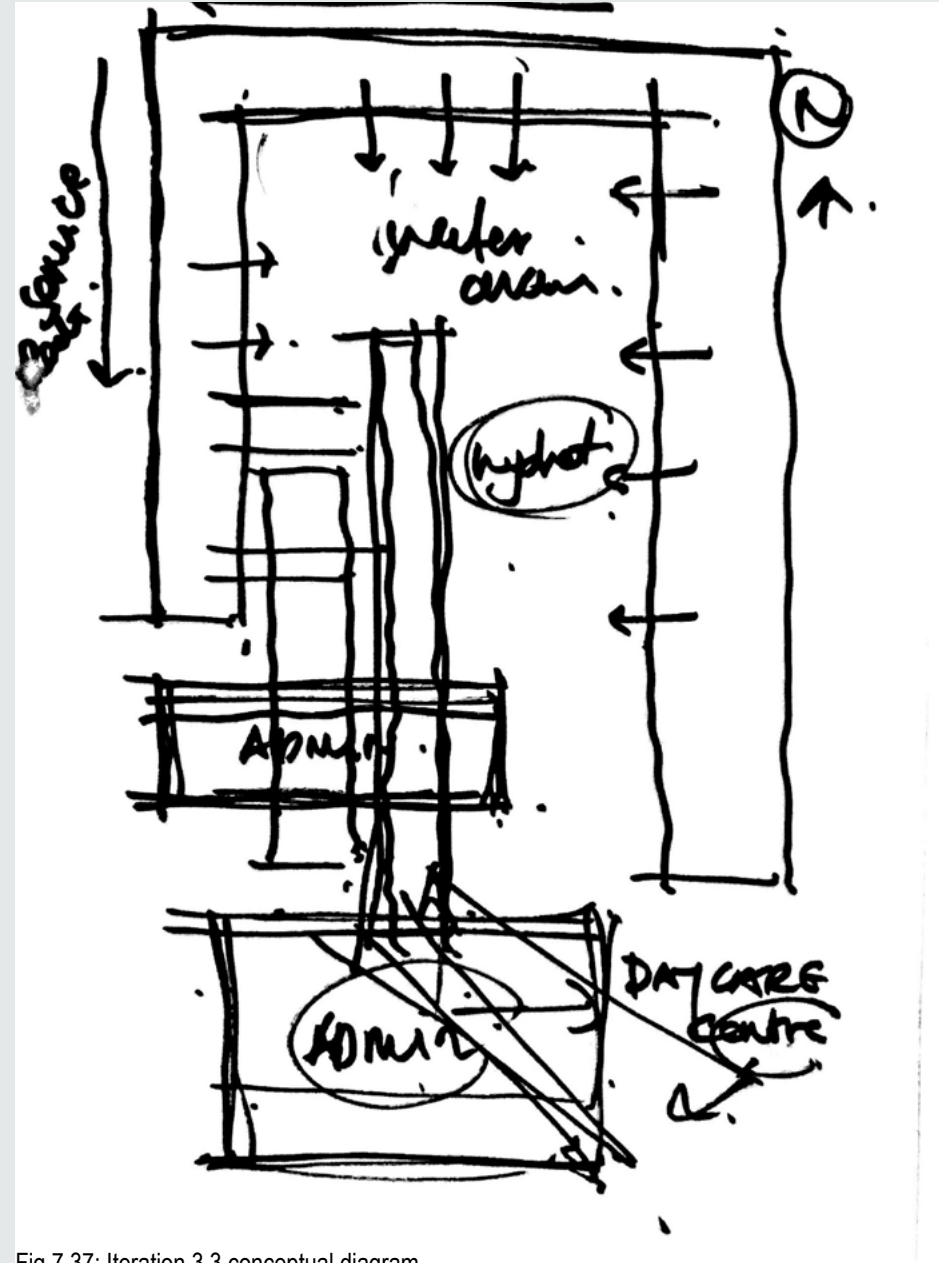


Fig 7.37: Iteration 3.3 conceptual diagram

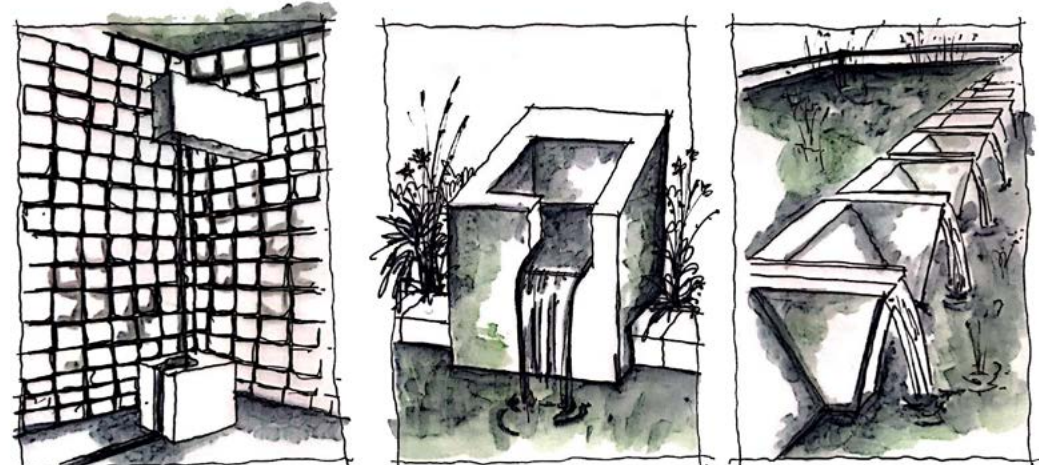


Fig 7.35: Iteration 3.2 aqua poetics explored

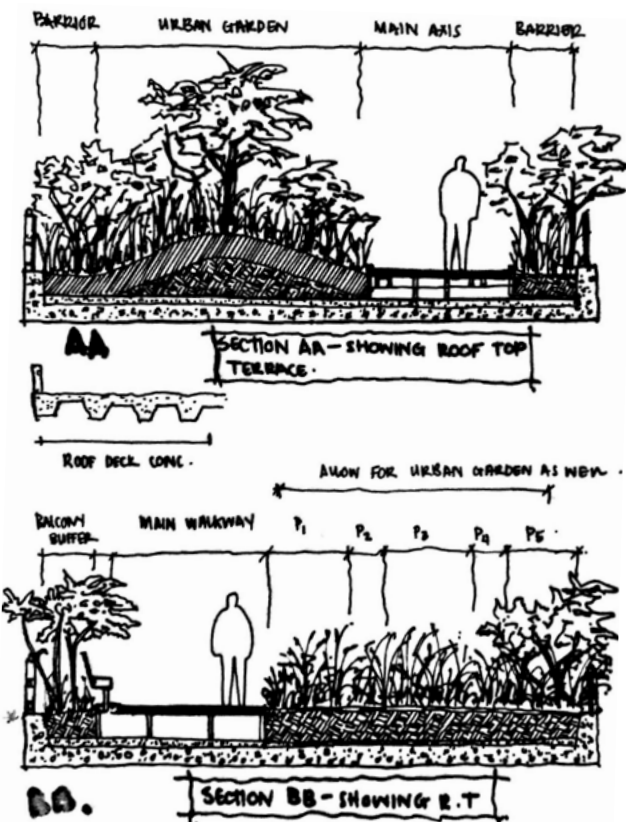


Fig 7.38: Iteration 3.3 rooftop terrace section explored

Fig 7.39: Iteration 3.3 internal walkways and gardens section explored

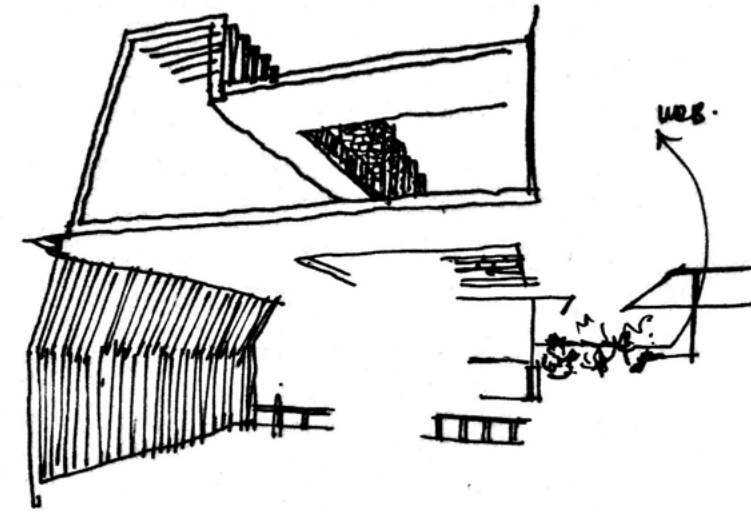


Fig 7.40: Iteration 3.3 green house form explored

Iteration 3.3 focused on simplifying the form of the building, freeing the internal wetland, grouping similar programmes together and articulating the external edge of the building.

This iteration further defined the main entrance, a pedestrian bridge that links the oncology centre and the Urban Garden, allowing it to become a pedestrian promenade that incorporates a plant nursery, frames the approach towards the building and highlights the bird sanctuary and viewing deck as prominent features on site. The linearity of the pedestrian bridge is defined by three tall hydrotherapy towers.

An additional entrance on the eastern side of the building is designed to allow the ease of access to users that do not come from the Urban Garden; users now have direct access from the street edge. This entrance is also connected to the in house pharmacy that can be accessed by anyone. The café that was on ground floor has now been moved to the rooftop terrace, freeing up the ground floor, allowing for more wellness facilities.

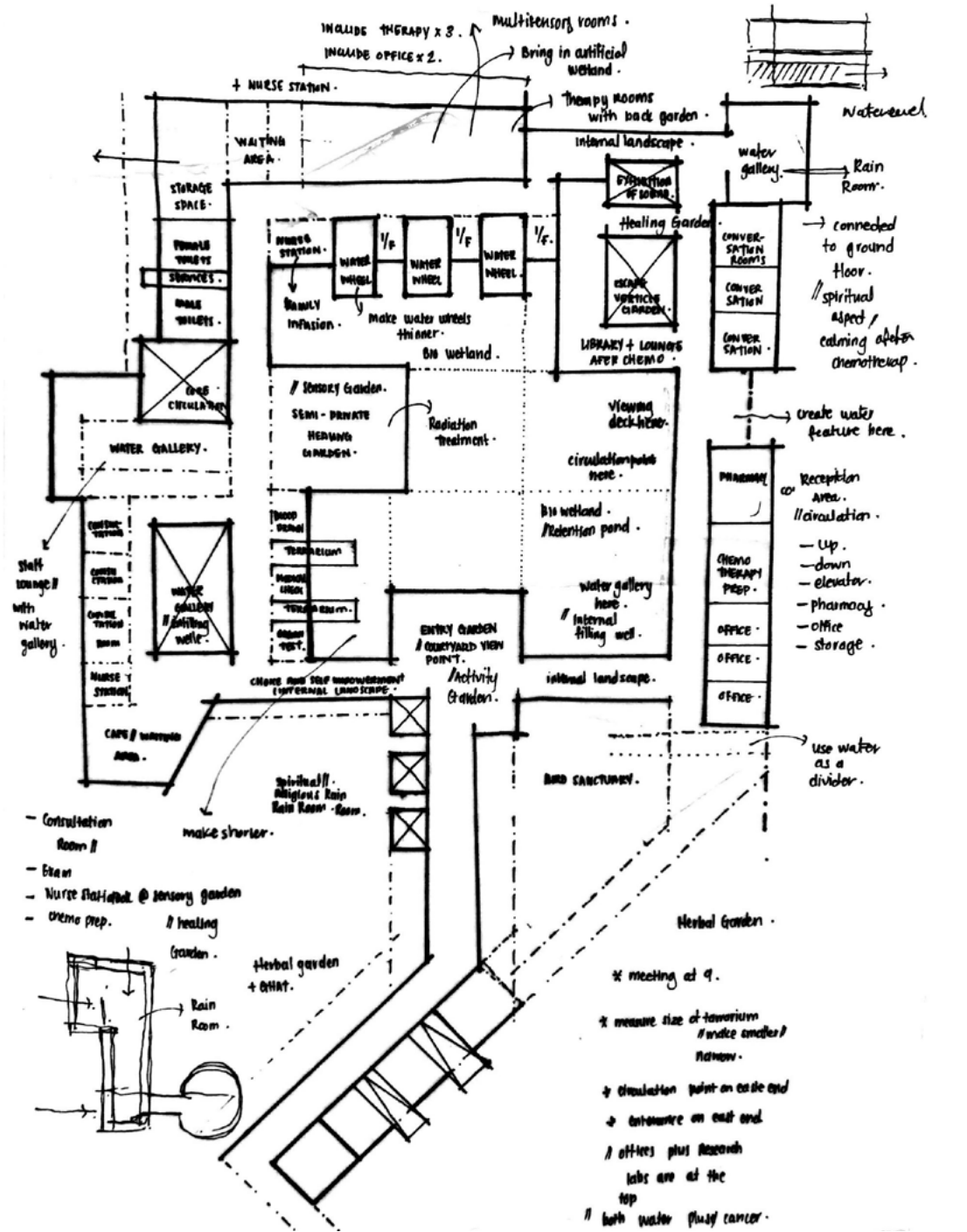


Fig 7.41: Iteration 3.3 programmatic layout explored

Physical remnants of the scarred landscape were also integrated into the design to create internal filling wells and dry landscapes, therefore voids are designed around the old landscape; this exposure emphasises and celebrates the importance and healing qualities of the natural environment.

Internal and external walkways and courtyards are used to define the different levels of privacy. Semi-private healing garden and green house is placed off centre in the middle of the building, with views towards the water and eastern light filtering through it.

Critique:

By moving the café to the roof top, it becomes inaccessible to the public. Allow the water to start seeping into the building, creating more spatial definition, Relook at the building contextual response on the street edge.

Fig 7.42: Pedestrian bridge is defined by three tall hydrotherapy towers.

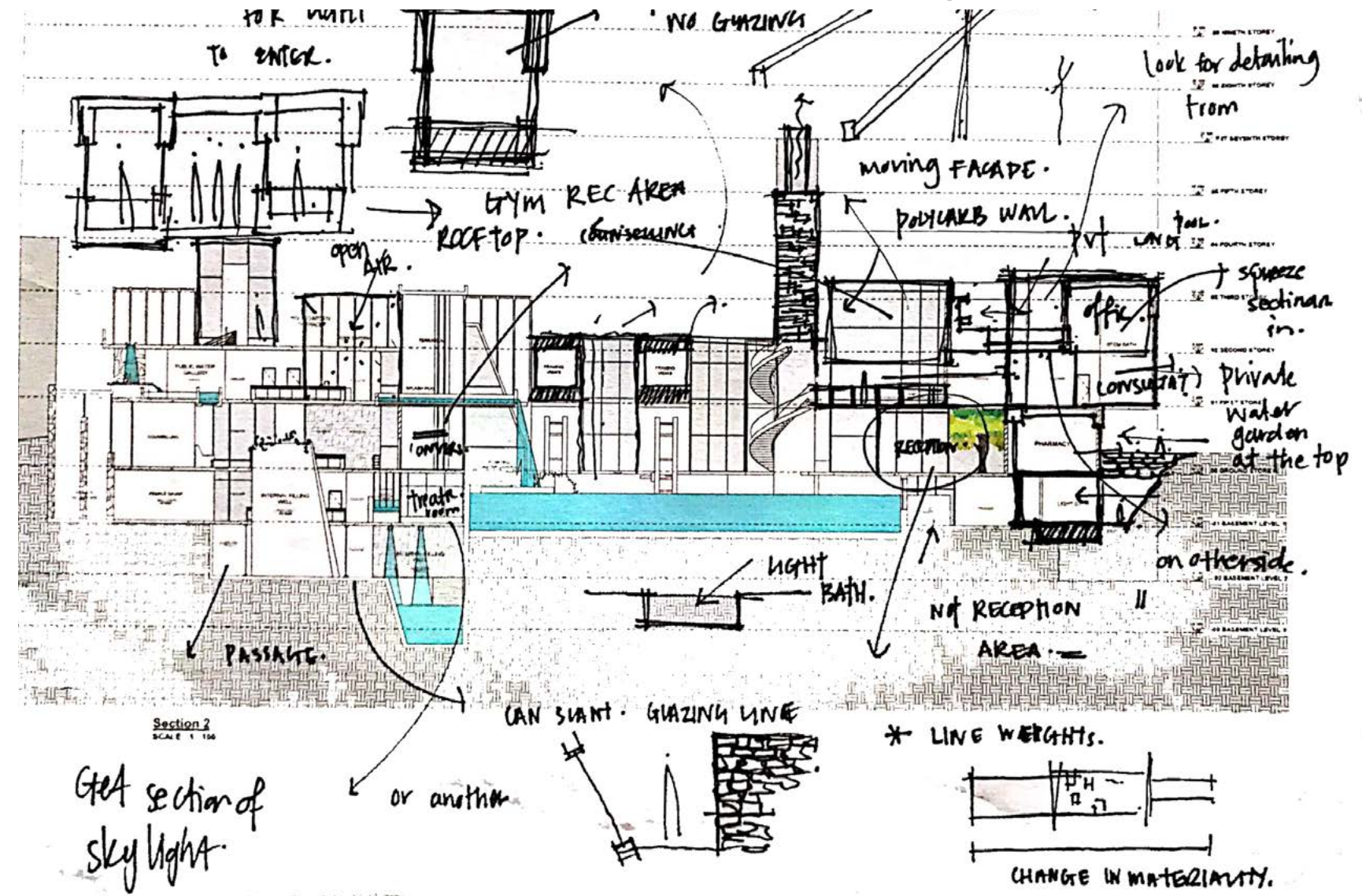
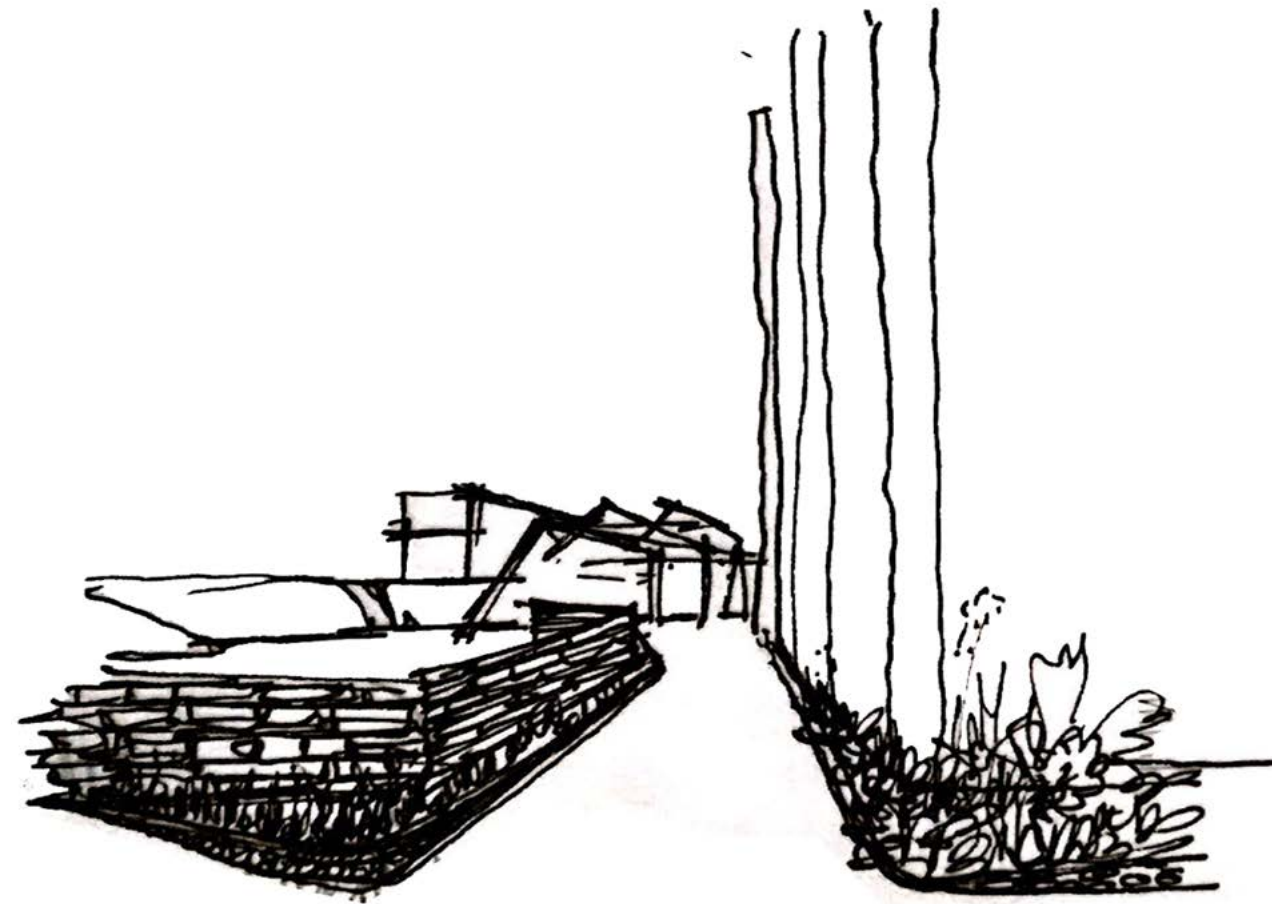


Fig 7.43: Iteration 3.3 short section

SECTION EXPLORATION

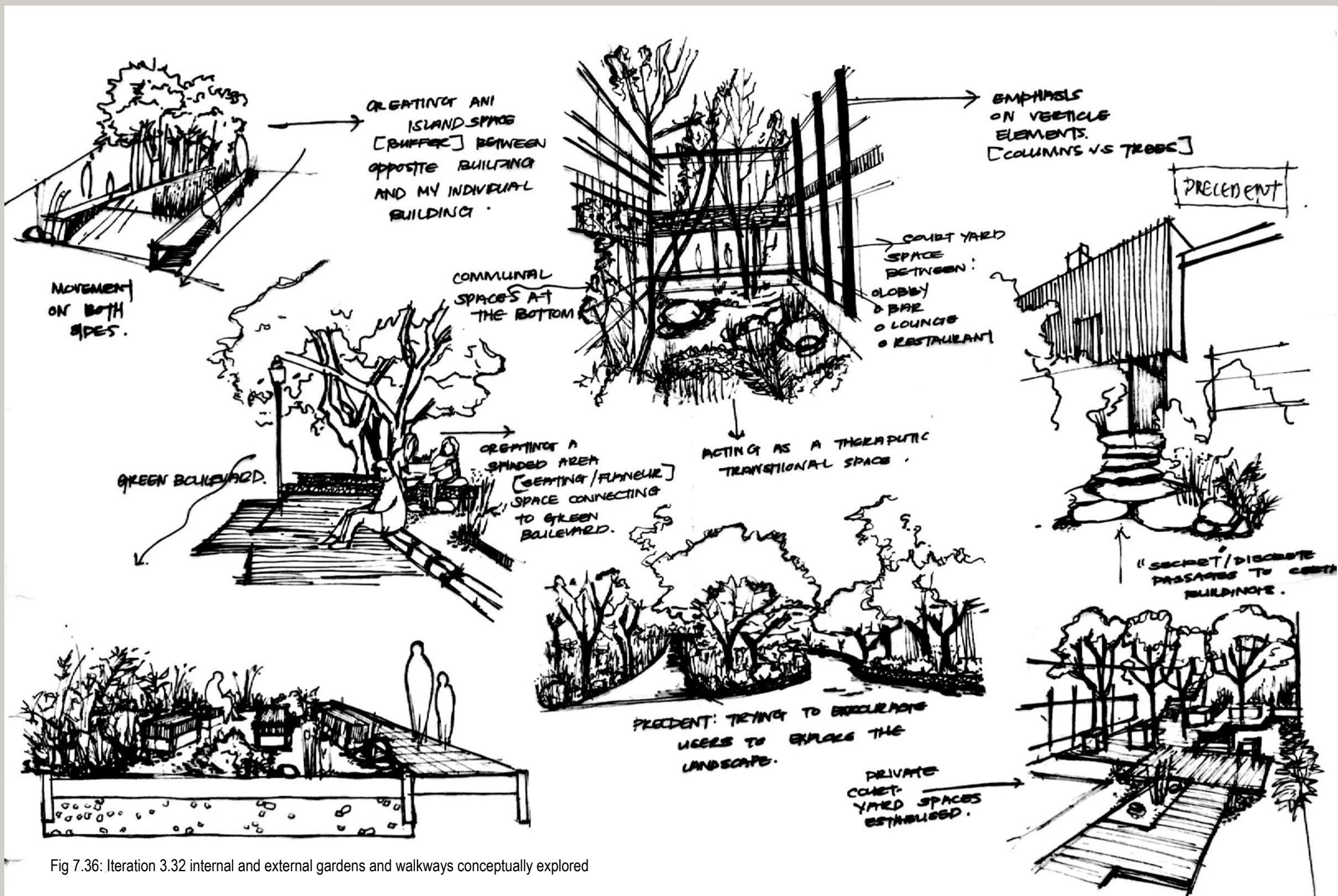
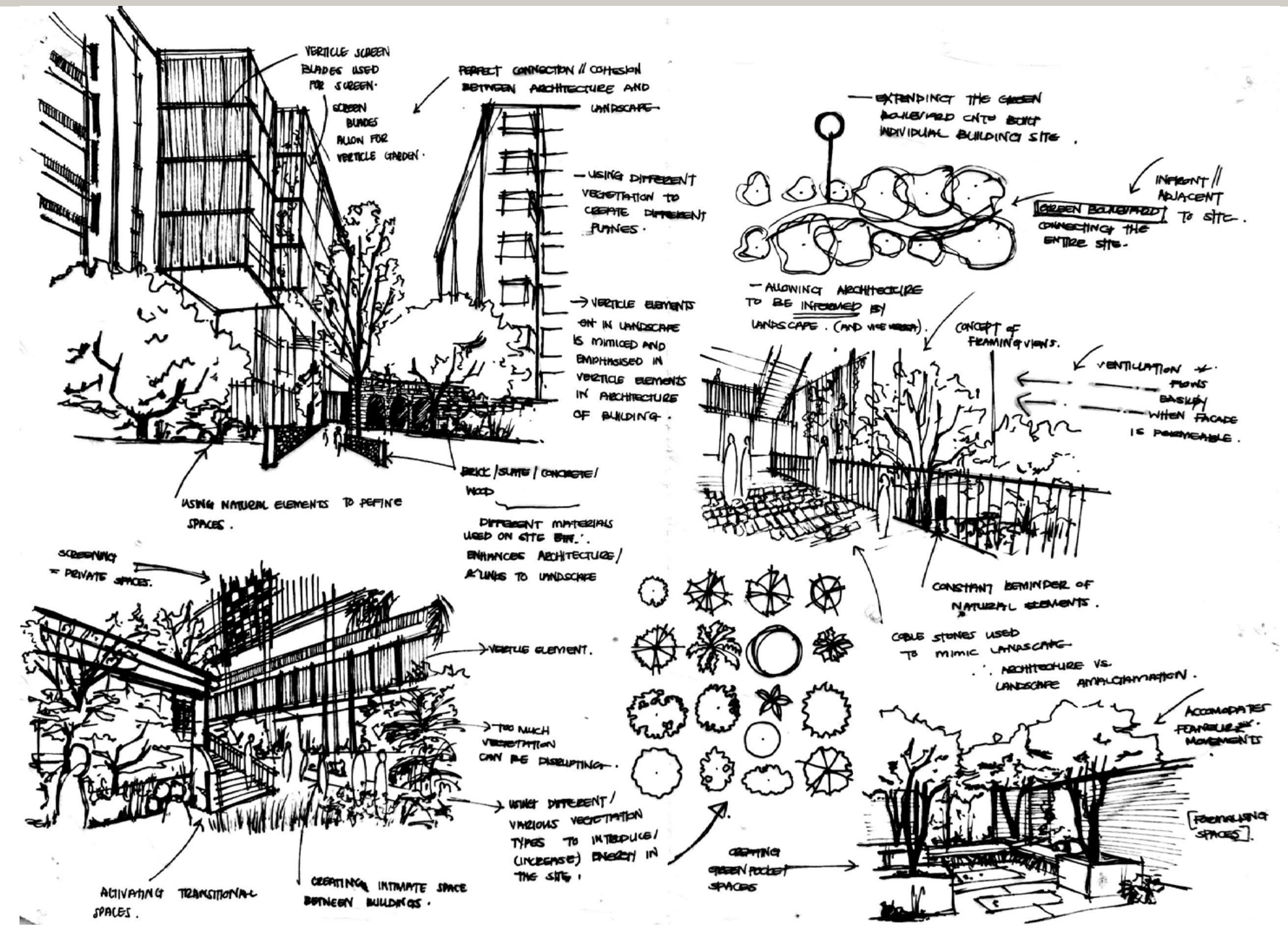


Fig 7.36: Iteration 3.32 internal and external gardens and walkways conceptually explored



ITERATION 3.4

ARCHITECTURE VS NATURE

The design of the treatment centre is based on a simple concept that reconstructs the standard healthcare typology design and principles by creating a journey through a series of both internal and external environments, that reflect the narrative experience of the patient, leading up to a key threshold on site, where the user feels a sense of immersion prompted by the amalgamation between architecture and landscape.

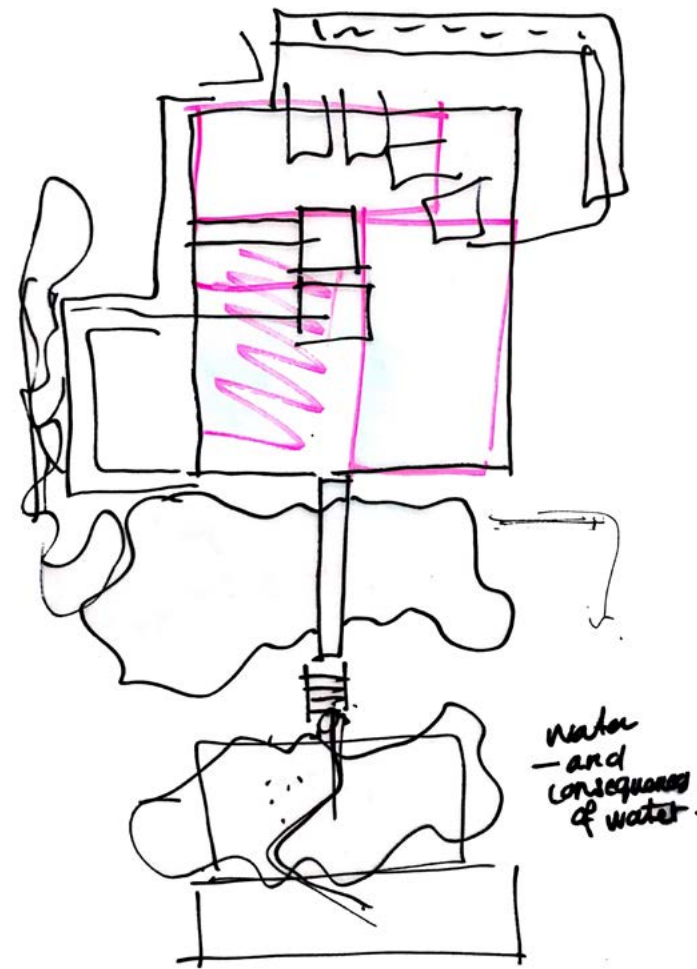


Fig 7.45 Iteration 3.4. Architecture vs Nature conceptual diagram

STEREOTOMIC VS. TECTONIC

The Building itself explores the idea of stereotomic vs. tectonic mass by drawing parallels between different levels of privacy; stone and brick walls are used to define private areas such as consultation rooms, blood work, individual chemotherapy, all hydrotherapy rooms and medical services. Whereas polycarbonate walls, steel screens and partition walls are used to define semi-private spaces such as the library, reading rooms, conversation rooms, workshop areas, boardrooms, group therapy rooms, physiotherapy rooms and the gym. Public areas such as walkways, the green house, internal gardens, and communal spaces are either open air or defined by glass.

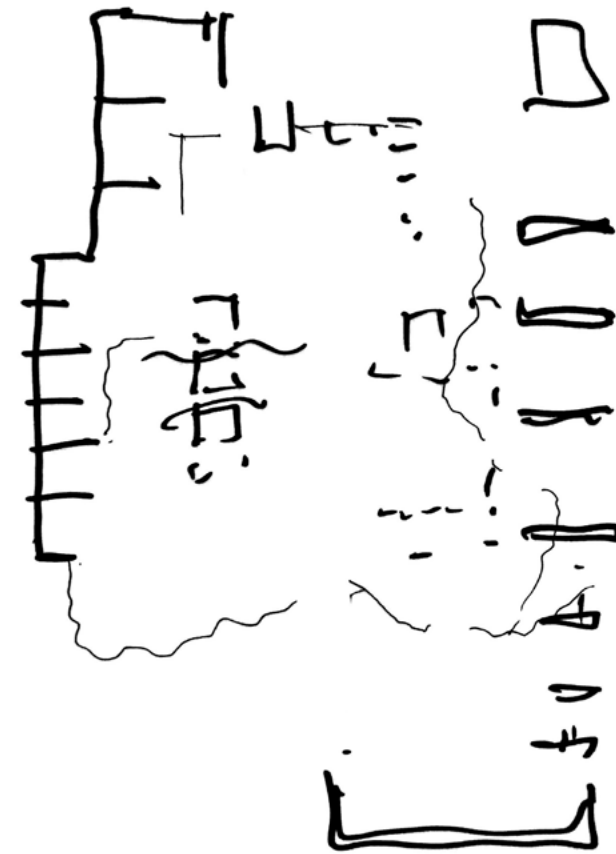


Fig 7.46: Iteration 3.4. Stereotomic vs. Tectonic conceptual diagram

SOLID VS. VOID.

Due to the building being designed around the water creating a balanced between solid versus void. Prominent walkways are designed around the internal end of the building defining a public interactive edge and allowing constant access, interaction and views towards the tranquility of the water. The void filled by the water induces evaporative cooling, therefore ventilating the entire building.

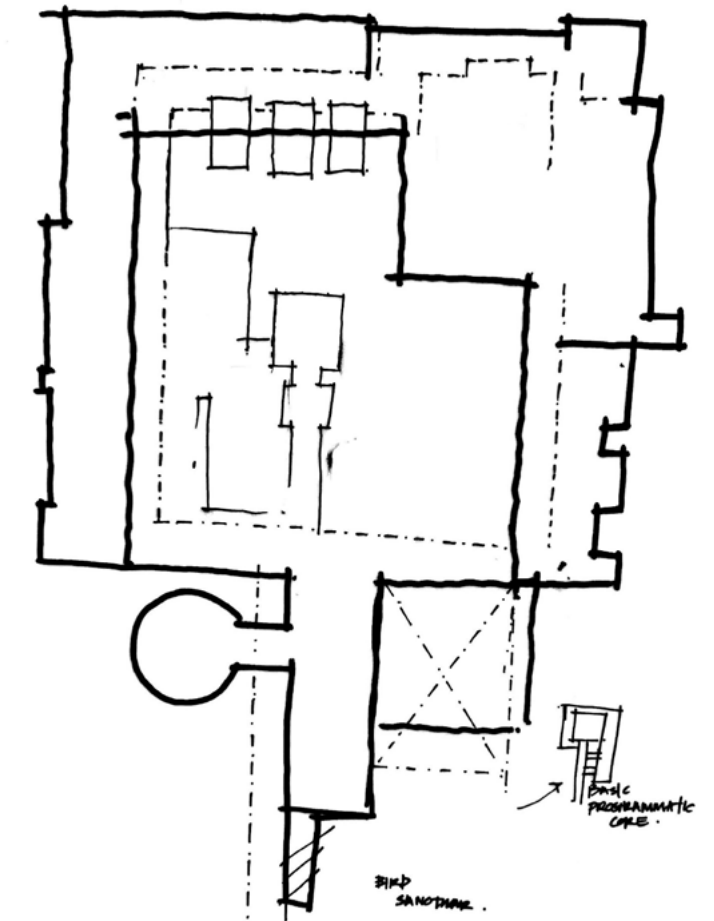


Fig 7.47: Iteration 3.4. Solid vs. Void conceptual diagram

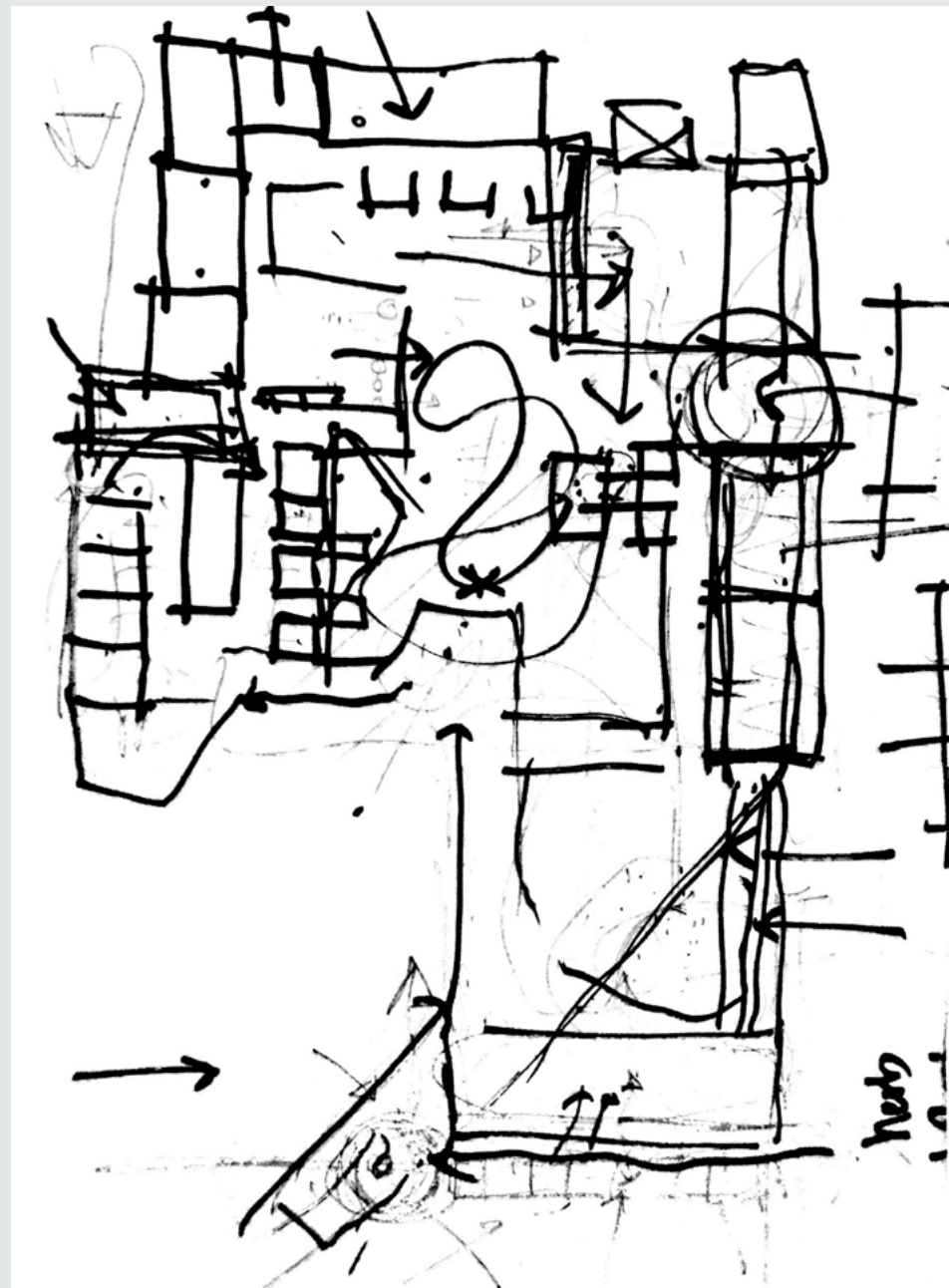


Fig 7.44: Iteration 3.4. Conceptual diagram

BASEMENT

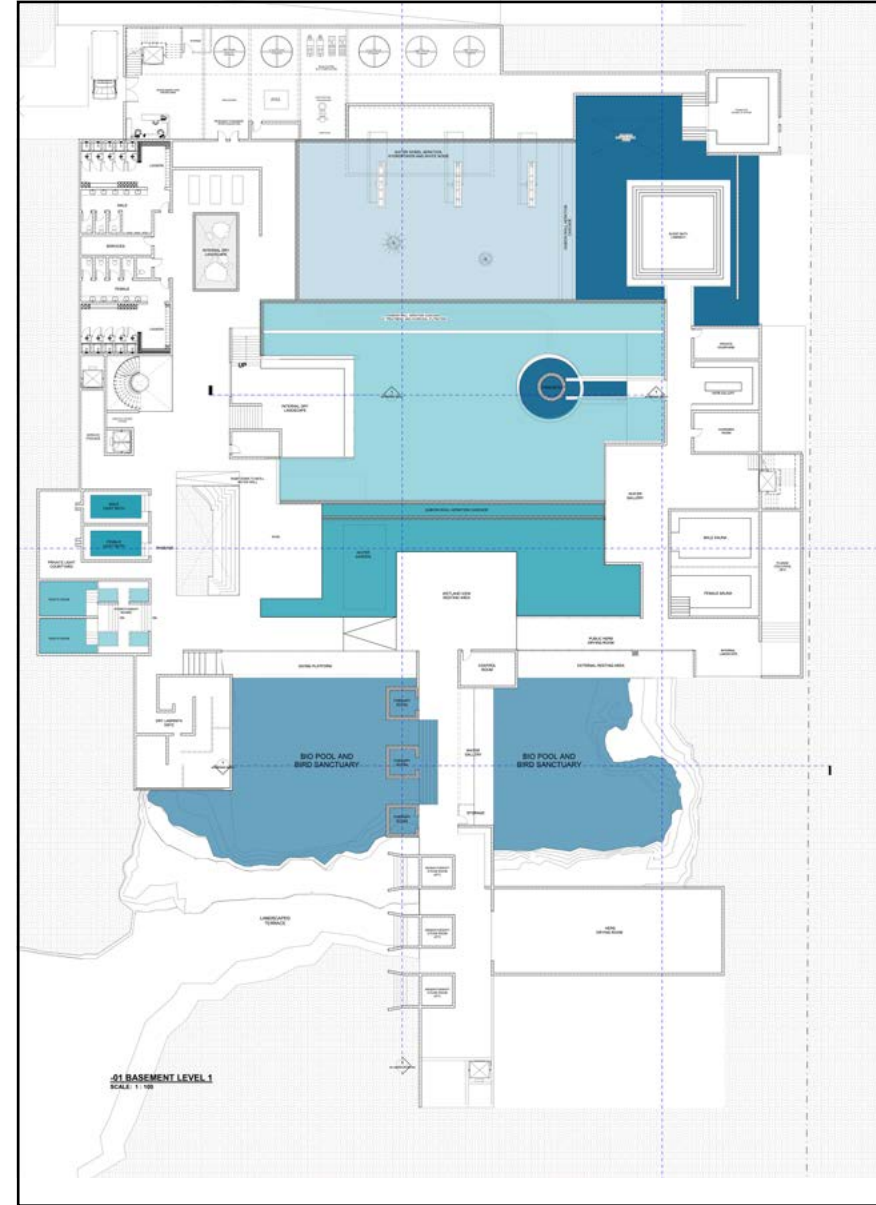


Fig 7.48: Iteration 3.5. Basement Floor

GROUND FLOOR

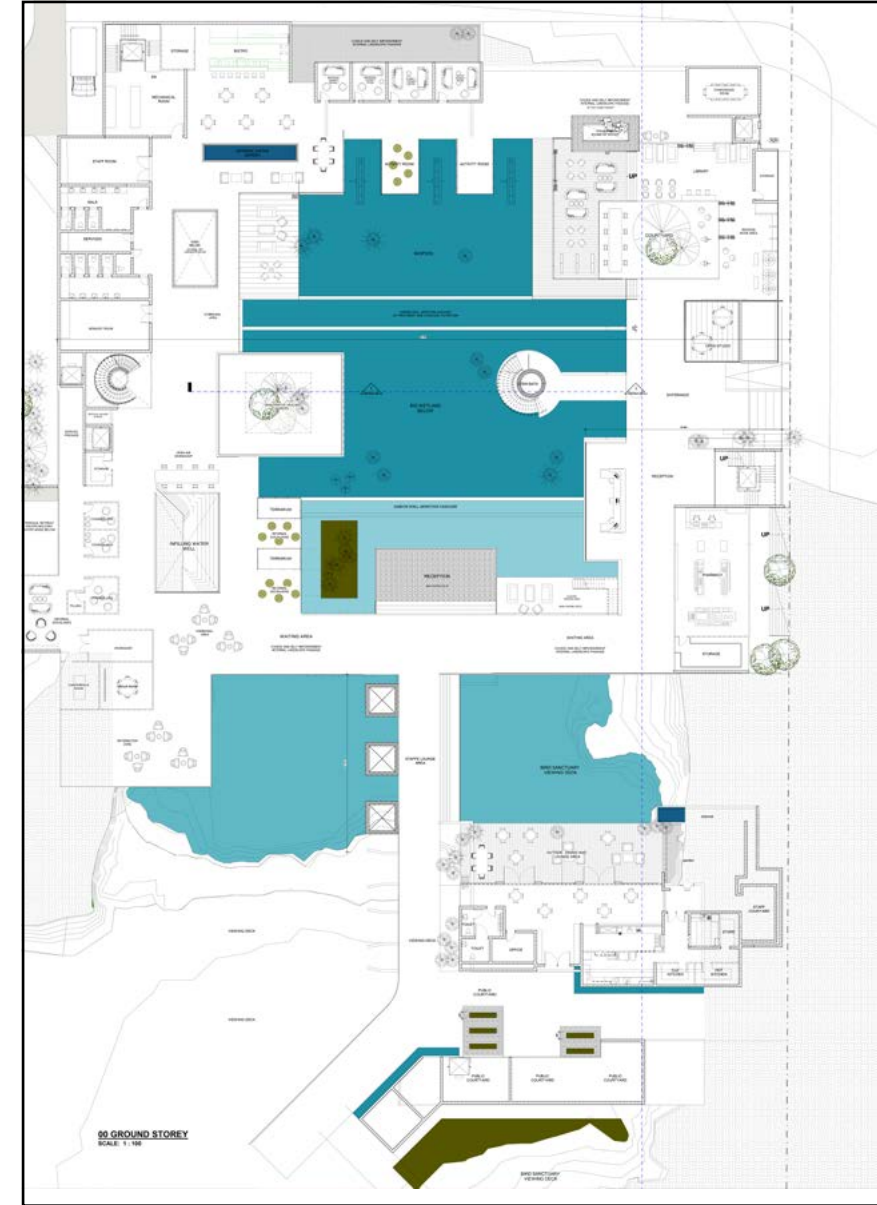


Fig 7.49: Iteration 3.5. Ground Floor

FIRST FLOOR

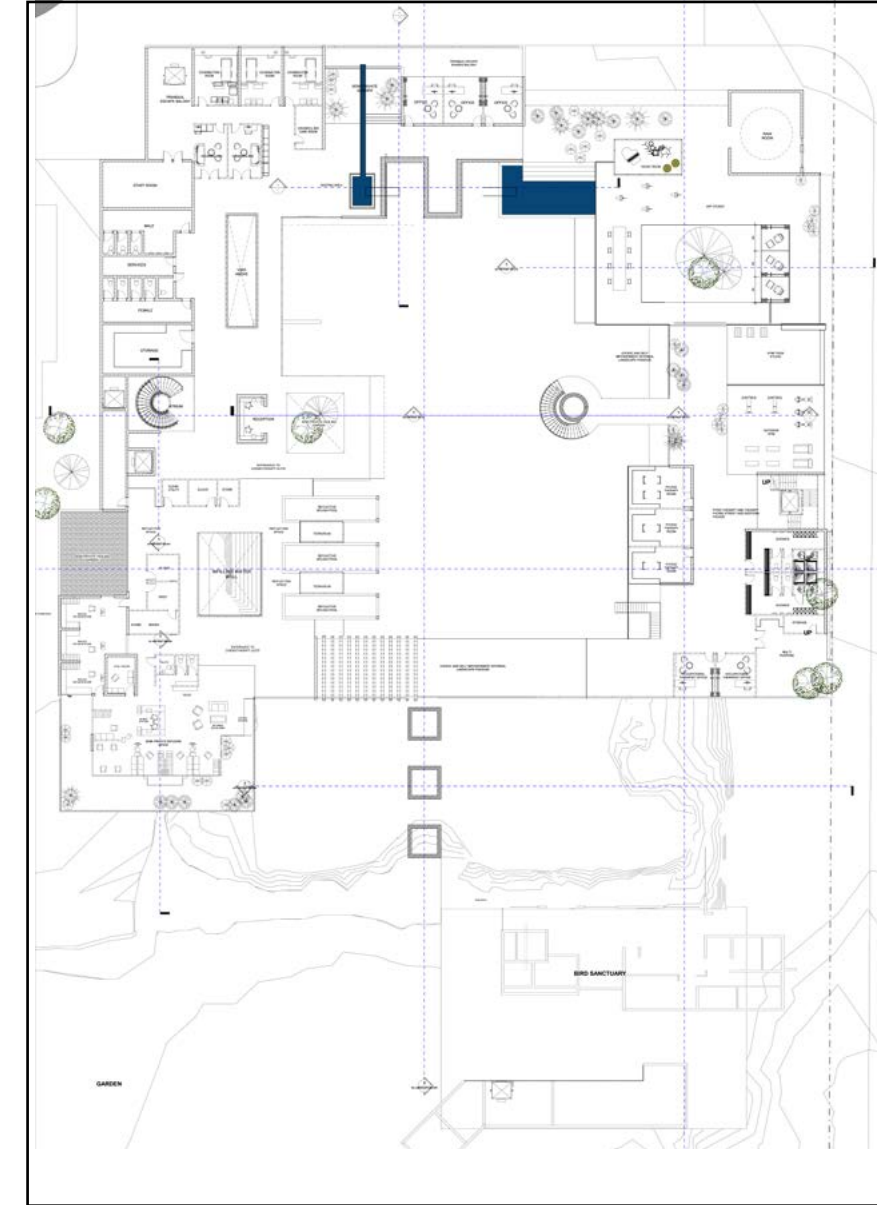


Fig 7.50: Iteration 3.5. First Floor

ITERATION 3.4

Iteration 3.4 explores a carefully and simplified plan that incorporates interlocking rooms that wrap around the cascading wetland. The effect is calming, contemplative, sensitive, sensorial and independent therefore reflecting a design that intends to promote the idea of therapeutic architecture.

Hydrotherapy and aromatherapy towers are designed as alternative treatments on the basement floor. These therapies explore the ideas of herbal baths with varying temperatures to alleviate patients from any chronic physical pain that they feel.

The café was redesigned on the ground floor and the entrance of the oncology centre. Its connection to the pedestrian bridge and plant nursery and bird sanctuary establishes a public square and introduces a third entrance to the site from the street edge.

The first floor was designed to accommodate conservative treatments such as chemotherapy and radiation.

THE SECTION

The human scale of the building places focuses on the design qualities and benefits of open spaces, light, privacy and constant views and access to the external environment. The intent of the section is to show the nurturing spaces and reveal various ways in which patients, visitors and staff interact with water. The section also illustrates how technology of the design, how the building sits on the edge of the landscape and tanked to hold all the water.

Variation in heights also highlights the contextual response to the adjacent buildings.

Critique:

The section needs to be further developed to show the different materials used, an exploration of different roof typologies and lighting and ventilation control.

MAQUETTES EXPLORATION

SPATIAL BOUNDARIES OF WATER

The building is designed to allow water to run freely through its users can always hear, feel, smell, and be in the presences of water, therefore creating a sense of place for the patients and a new identity for the oncology centre.

Ones journey through the building is always signaled and guided by the flowing of water. The water is harvested from the urban garden runoff, ground water and rainwater harvest and filtered through a cascading wetland, sand, and UV filters before it enters the building for human use.

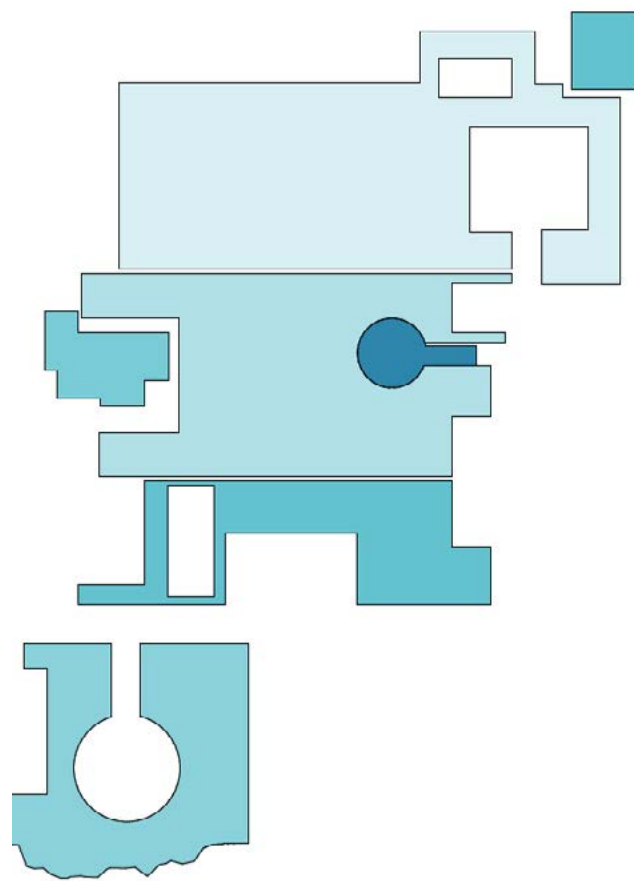


Fig 7.51: Spatial boundaries of water on plan

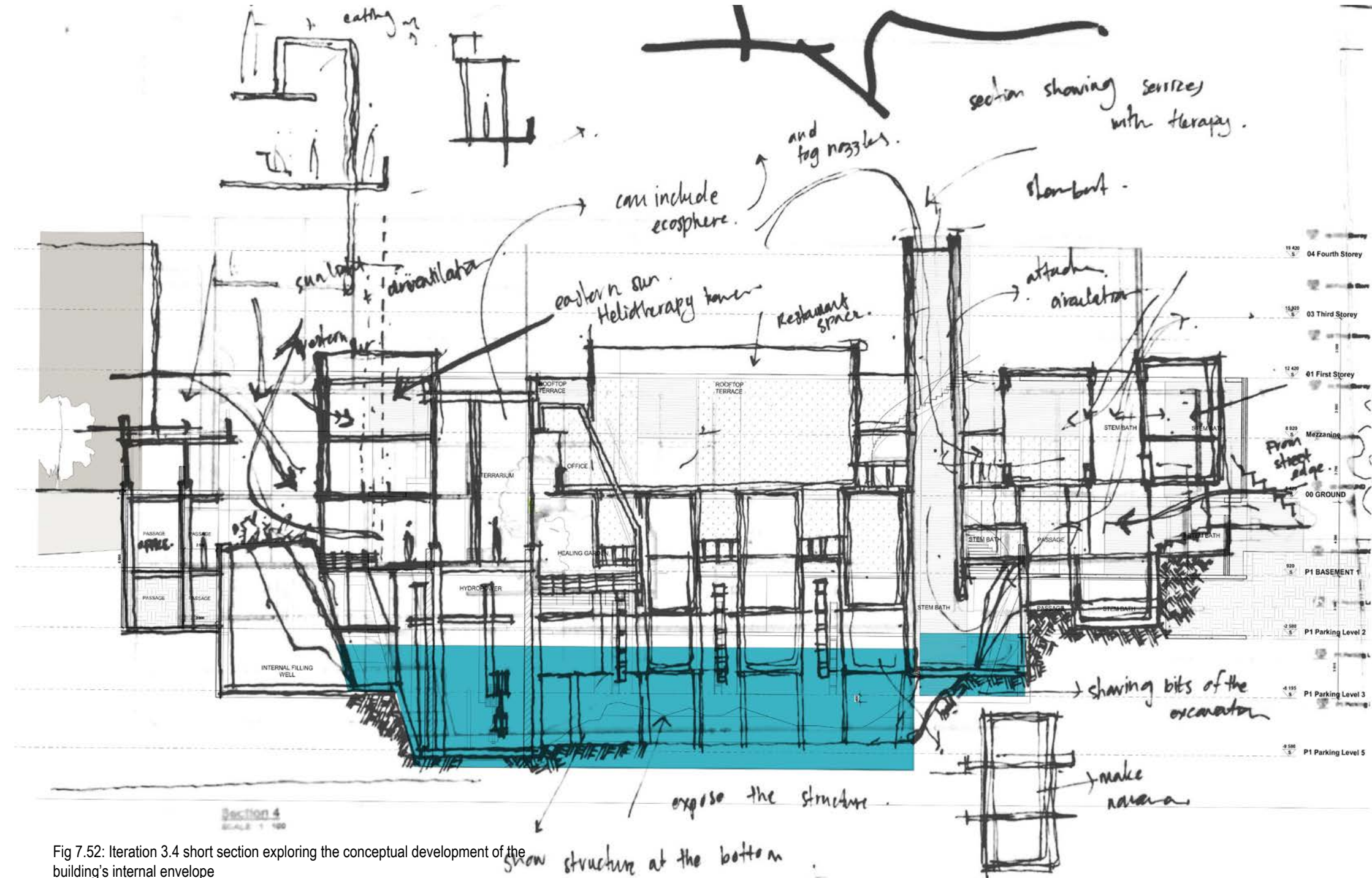


Fig 7.52: Iteration 3.4 short section exploring the conceptual development of the building's internal envelope

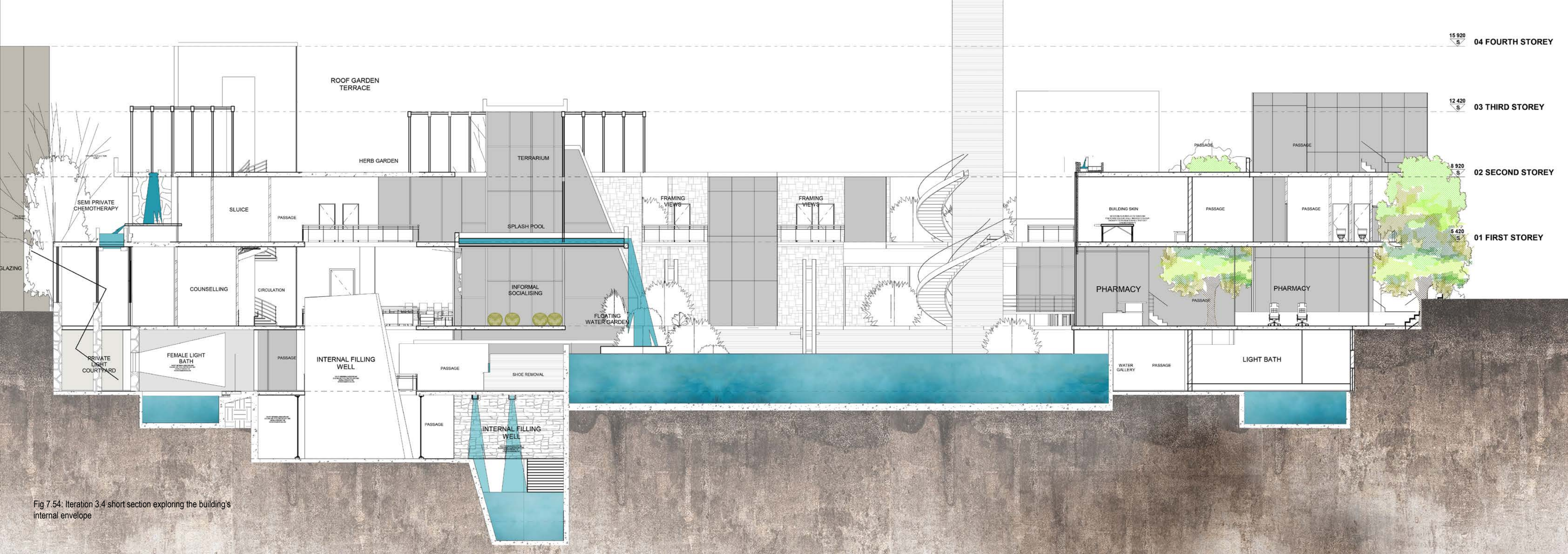


Fig 7.54: Iteration 3.4 short section exploring the building's internal envelope

MAQUETTES EXPLORATION

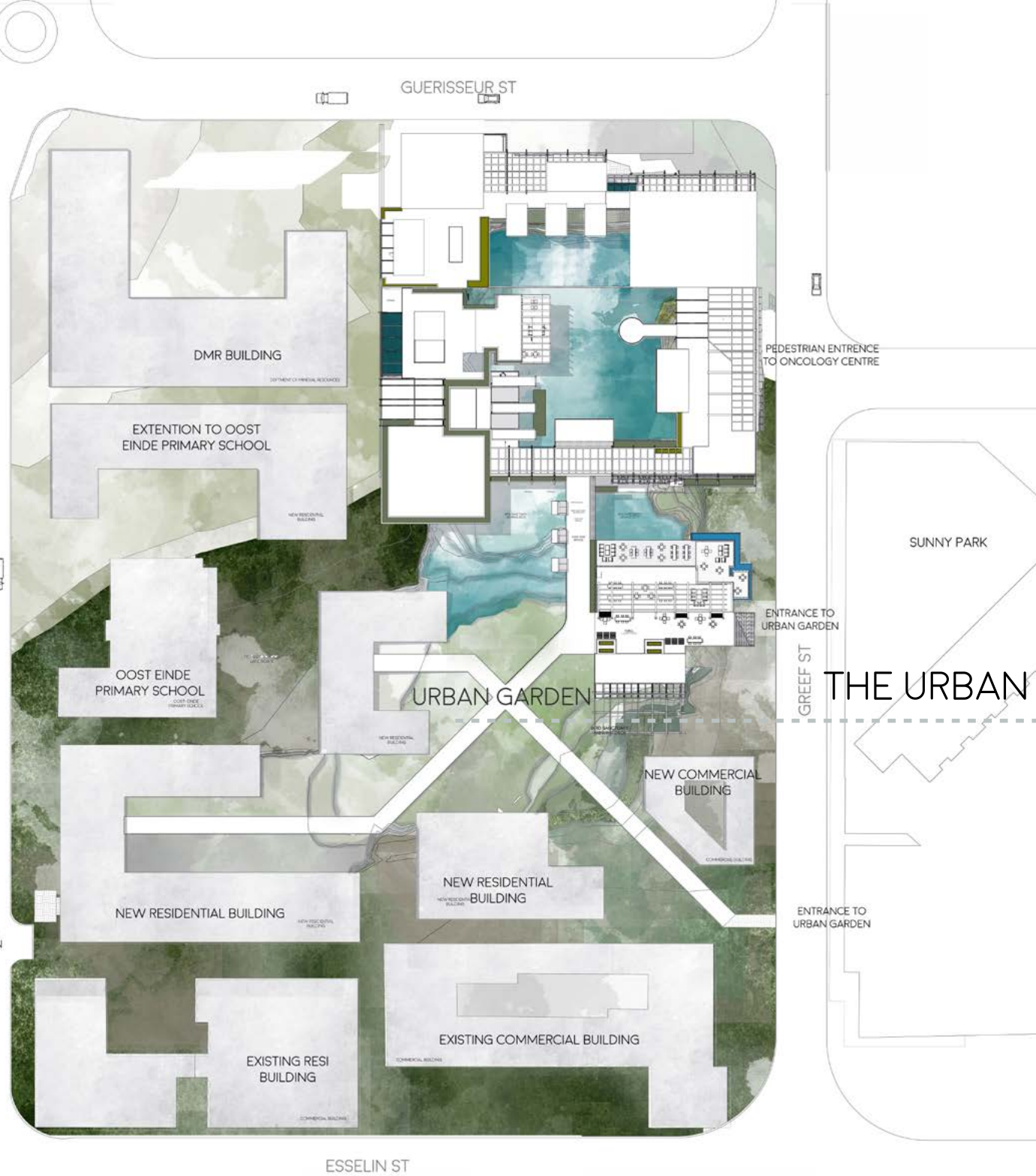


Fig 7.53: Iteration 3.4

FINAL DESIGN SITE PLAN

DTI BUILDING

ENTRANCE TO URBAN GARDEN



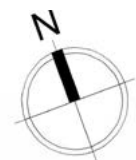
SITE PLAN
1:500



THE URBAN GARDEN



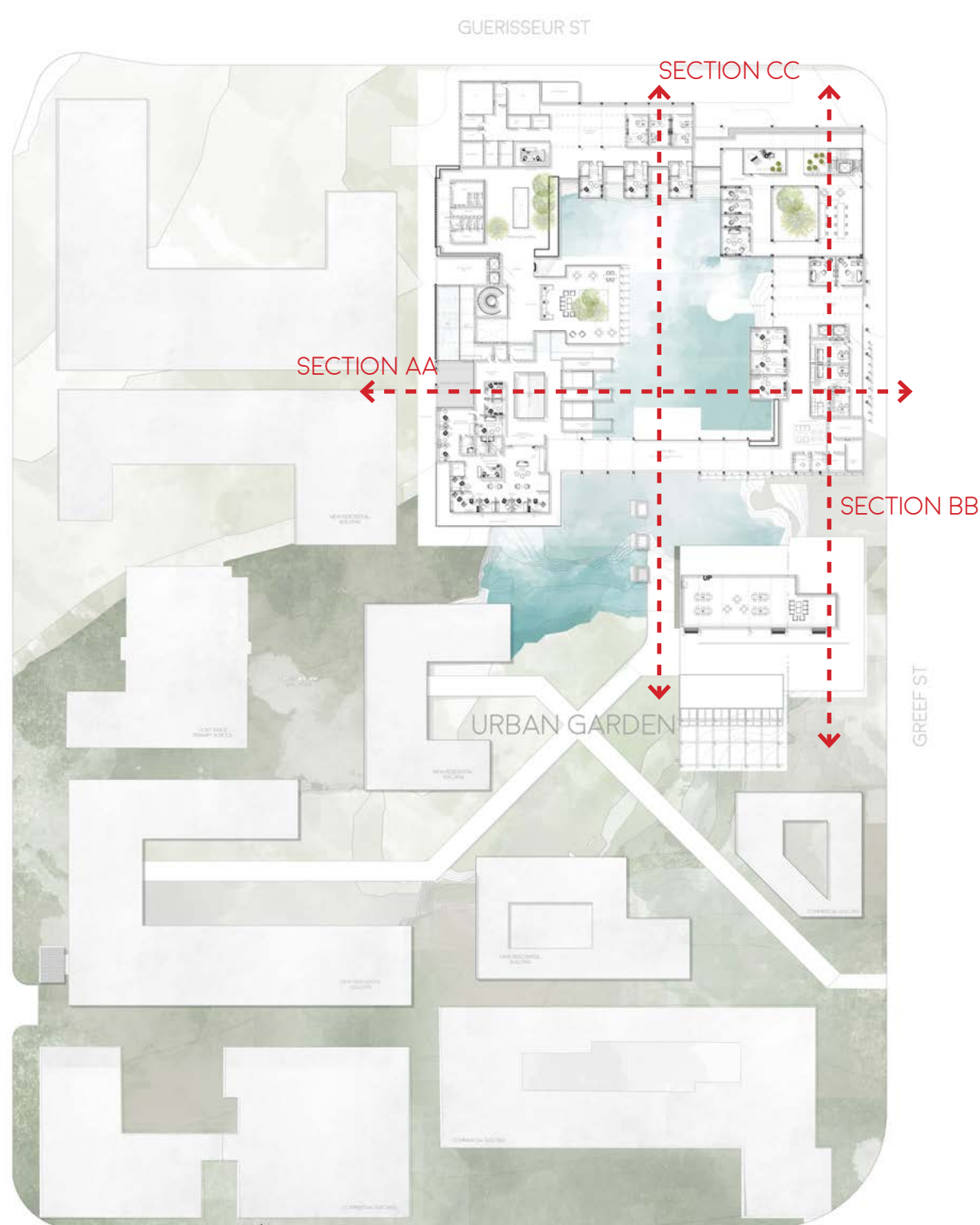
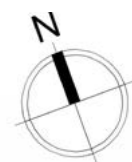
BASEMENT FLOOR PLAN
1:200

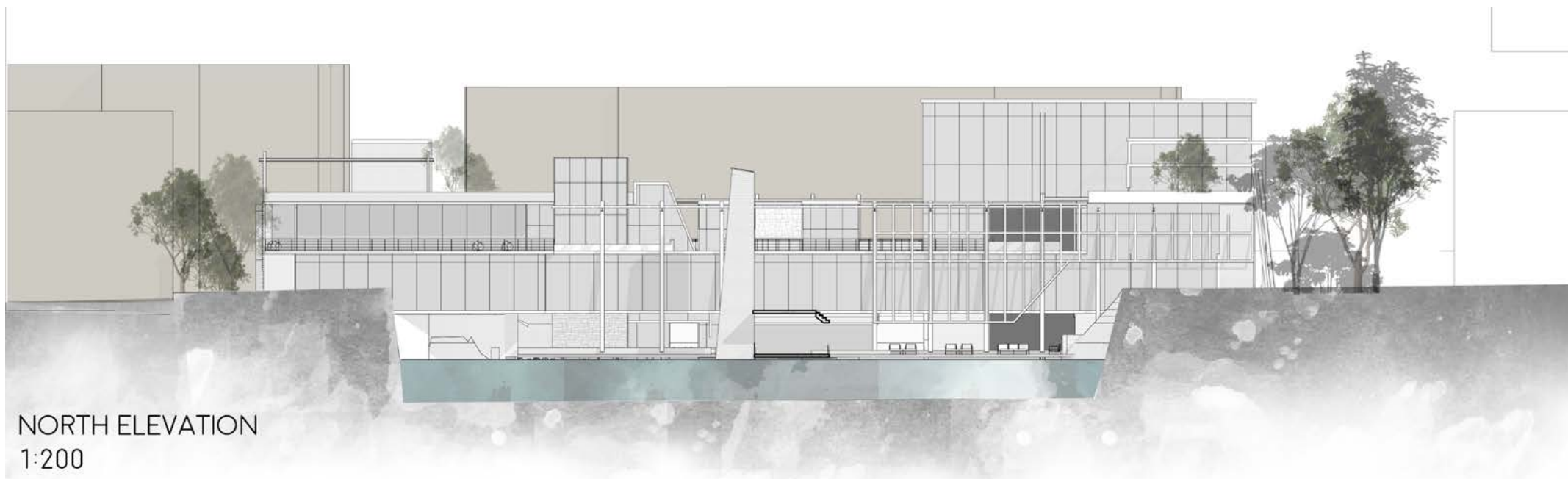


BASEMENT FLOOR PLAN
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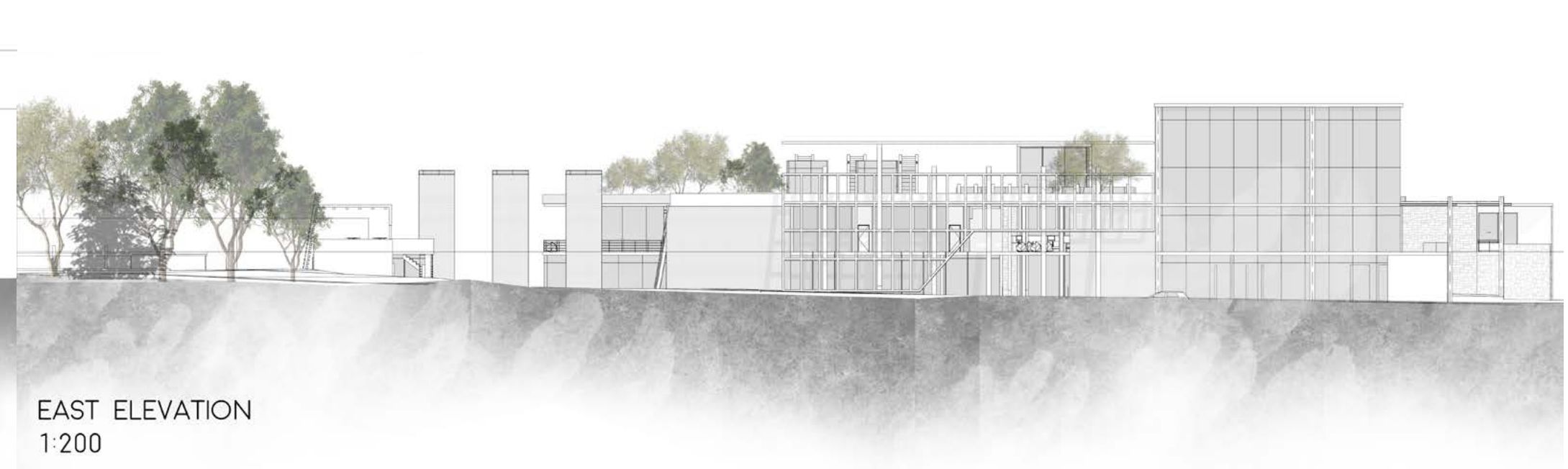


FIRST FLOOR PLAN
1:200

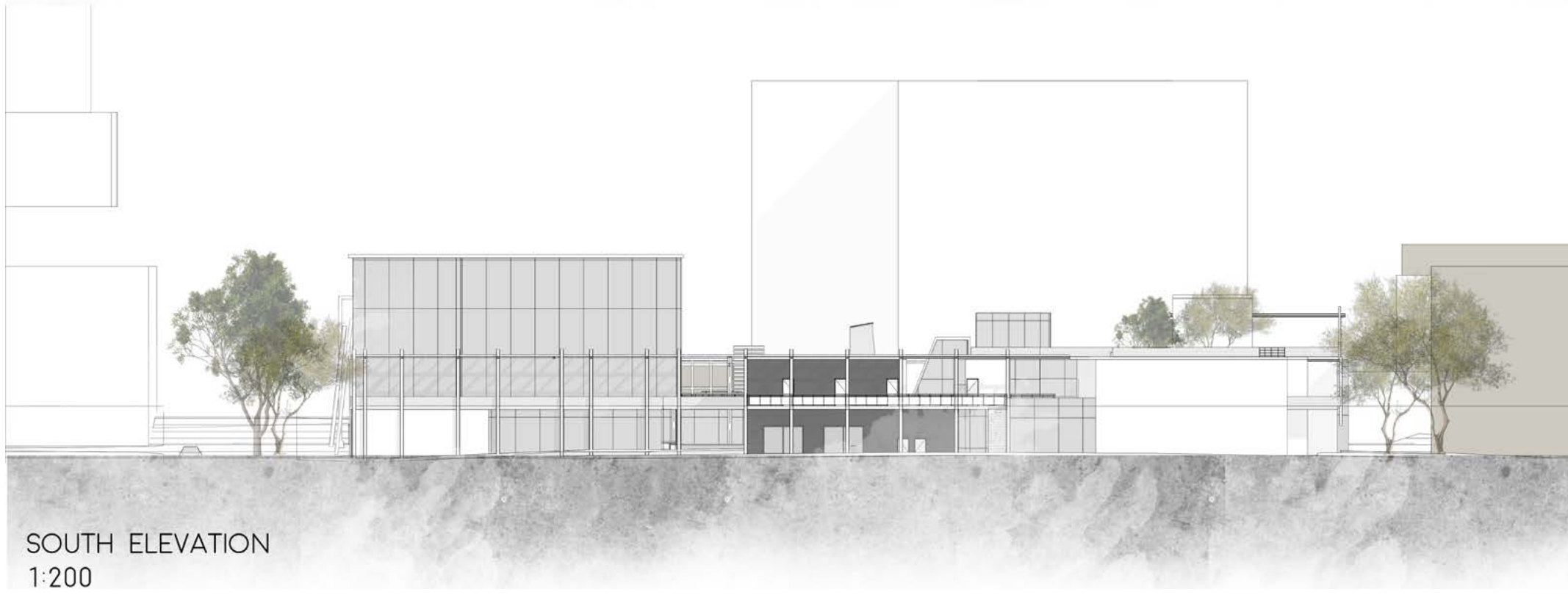




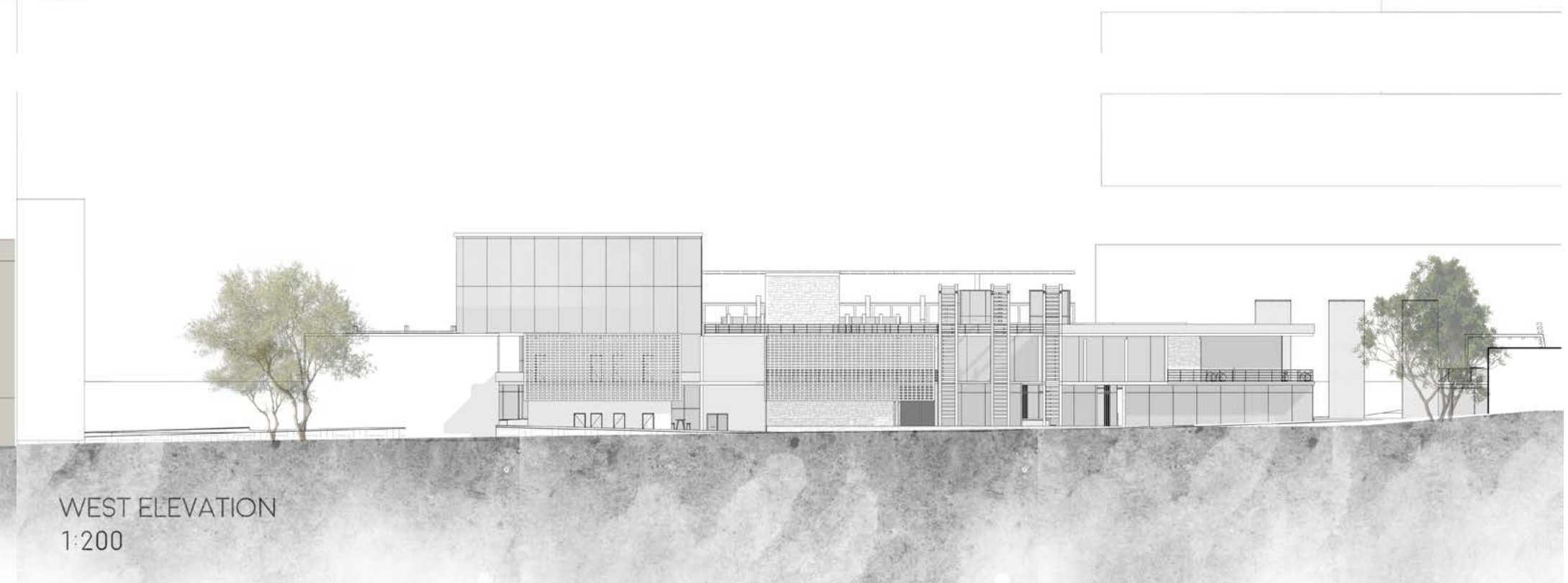
NORTH ELEVATION
1:200



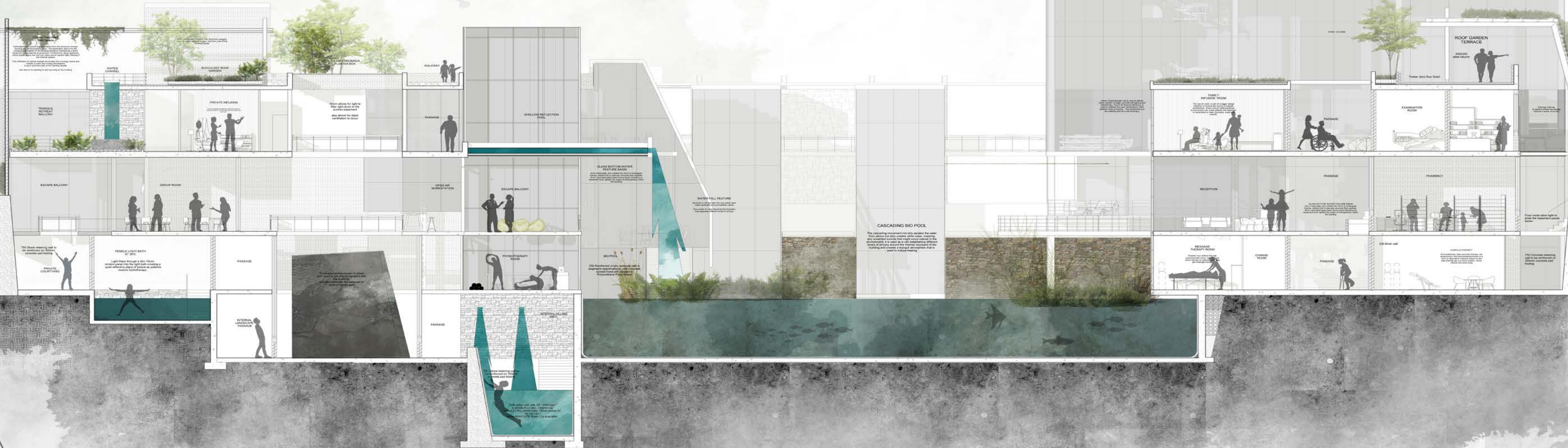
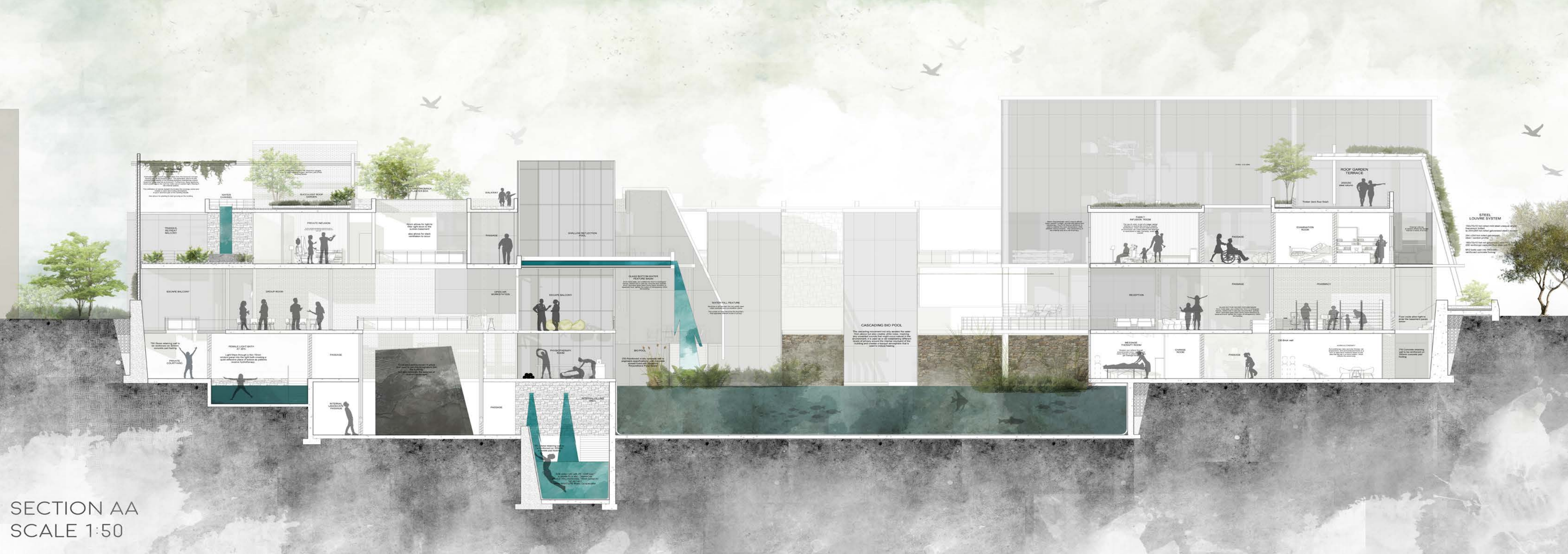
EAST ELEVATION
1:200



SOUTH ELEVATION
1:200



WEST ELEVATION
1:200



TRAVEL BALCONY
The balcony is designed to be used as a space for relaxation and exercise. It is located on the ground floor and is accessible from the main entrance.

WATER CHANNEL
A water channel runs through the building, providing a natural cooling effect and a source of water for the plants and animals.

BUCCOULET ROOF GARDEN
A roof garden with a variety of plants and trees, providing a natural cooling effect and a source of water for the plants and animals.

WALKWAY
A walkway runs through the building, providing a natural cooling effect and a source of water for the plants and animals.

PRIVATE INFUSION
A private infusion room for patients to receive treatment. It is located on the ground floor and is accessible from the main entrance.

Passage
A passage runs through the building, providing a natural cooling effect and a source of water for the plants and animals.

SHALLOW REFLECTION POOL
A shallow reflection pool located on the ground floor, providing a natural cooling effect and a source of water for the plants and animals.

GLASS BOTTOM WATER FEATURE BATH
A glass bottom water feature bath located on the ground floor, providing a natural cooling effect and a source of water for the plants and animals.

WATER FALL FEATURE
A water fall feature located on the ground floor, providing a natural cooling effect and a source of water for the plants and animals.

CASCADING BIO POOL
A cascading bio pool located on the ground floor, providing a natural cooling effect and a source of water for the plants and animals.

BIOPOL
A biopool located on the ground floor, providing a natural cooling effect and a source of water for the plants and animals.

RECEPTION
A reception area located on the ground floor, providing a natural cooling effect and a source of water for the plants and animals.

EXAMINATION ROOM
An examination room located on the ground floor, providing a natural cooling effect and a source of water for the plants and animals.

PHYSIOTHERAPY ROOM
A physiotherapy room located on the ground floor, providing a natural cooling effect and a source of water for the plants and animals.

ROOF GARDEN TERRACE
A roof garden terrace located on the ground floor, providing a natural cooling effect and a source of water for the plants and animals.

STEEL LOUVRE SYSTEM
A steel louvre system located on the ground floor, providing a natural cooling effect and a source of water for the plants and animals.

RECEPTION
A reception area located on the ground floor, providing a natural cooling effect and a source of water for the plants and animals.

PHYSIOTHERAPY ROOM
A physiotherapy room located on the ground floor, providing a natural cooling effect and a source of water for the plants and animals.

EXAMINATION ROOM
An examination room located on the ground floor, providing a natural cooling effect and a source of water for the plants and animals.

RECEPTION
A reception area located on the ground floor, providing a natural cooling effect and a source of water for the plants and animals.

SECTION AA
SCALE 1:50



View 1
Approach towards Le Guerisseur from the Urban Garden



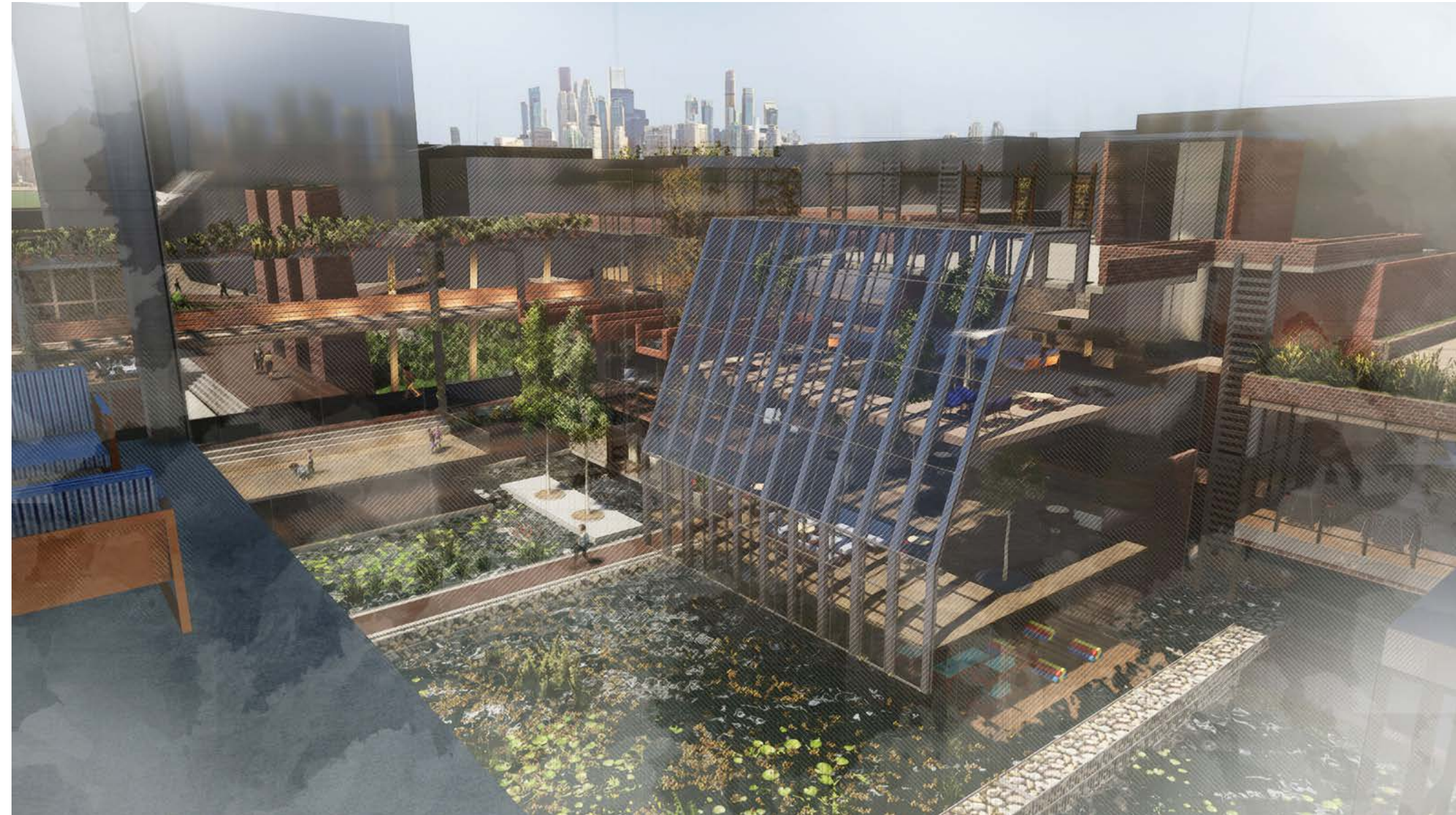
View 2
Approach towards Le Guerisseur from the Urban Garden



View 3
Street View of Bird Sanctuary Bio Pool and Urban Garden Restaurant



View 4
Main Entrance Viewing Deck



View 5
View of cascading bio pools from Library first floor



View 6
View from Library deck looking onto cantilevering viewing deck



View 7
View from cantilevering viewing deck



View 8
Private family infusion room.



View 9
View from Library internal landscape atrium walkway



Fig 8.1: "Hark" (Knapp 2013)



TECHNOLOGY

This chapter aims to explore how the applied theory of Therapeutic Architecture can further translate and develop the design concept and intentions of the Urban Cancer Treatment Centre into technical resolutions. A technical concept is used to inform the makings of the building; the structural intention, materiality, building systems and services are pushed through to technification. Environmental and sustainable technologies are then discussed to further guarantee the regeneration of the scared landscape.

TECHNICAL CONCEPT :

FRAMED fluidity

The technical premise of the cancer treatment facility is grounded on Kenneth Frampton's theories of structure. Kenneth builds on Gottfried Semper's division of architectural composition into the stereotomic (solidity) and the tectonic (dematerialisation) which he further defines by drawing similarities from cosmetology by comparing stereotomic elements to the earth and the tectonic to the sky. (Frampton, 2015: 51-57)

Where as Le Guerisseur defines its technical premise by drawing parallels from the similarities that lie between the human body and specific characteristics of nature.

The technology aims to explore and introduce a **CONCEPT OF TRANSITION** that redefines the current **disconnect** to one of **reconciliation**, therefore, creating an enhanced **RECIPROCI- TY** the lies **between natural and human conditions**. The technology uses **WATER** not only as an element but a material that becomes the **thread** that combines the two, therefore, establishing a **fluid transition** and portraying the duality that lies between man and nature, building and landscape, thus illustrating the fundamental objectives of Therapeutic Architecture.



Fig 8.2 Technical Concept

BUILDING CONSTRUCTION ILLUSTRATED

BUILDING CONSTRUCTION ILLUSTRATED

PARTI DIAGRAM

* COMPARISON DRAWN FROM EARTH AND SKY.
 * COSMOLOGY REFERS AS WELL.
 * USING FRAMPTON'S THEORY OF STRUCTURE

* USING FRAMPTON'S THEORY OF STRUCTURE
 * COMPARISON DRAWN FROM EARTH AND SKY.
 * COSMOLOGY REFERS AS WELL.

- PICTURING STRUCTURAL CONCEPT
 - BUILDING - DRAWS COMPARISON TO WATER CYCLE [EVAPORATION].

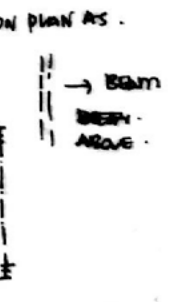
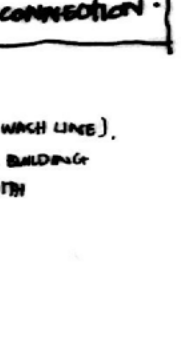
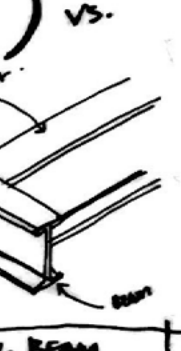
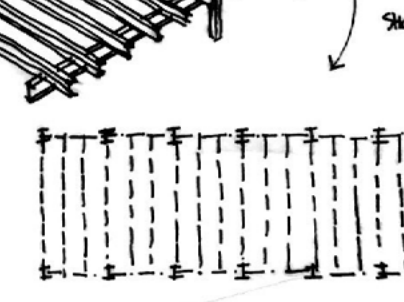
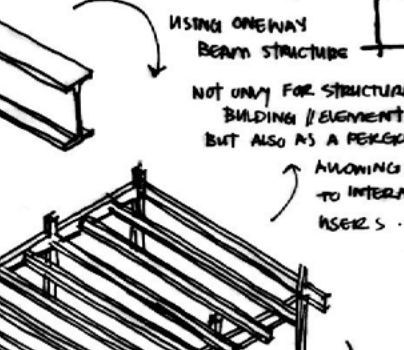
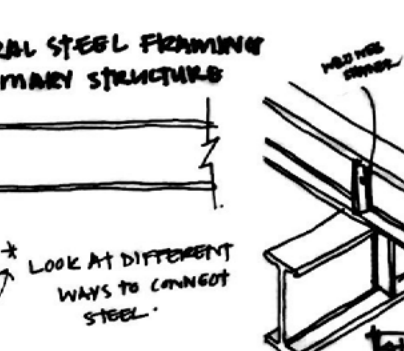
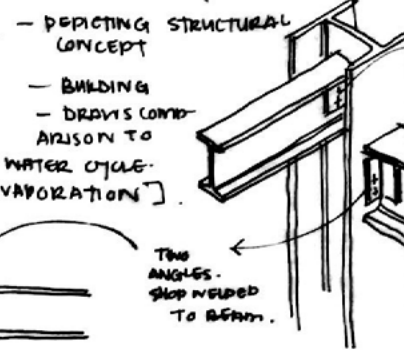
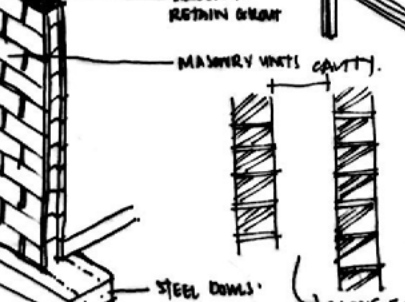
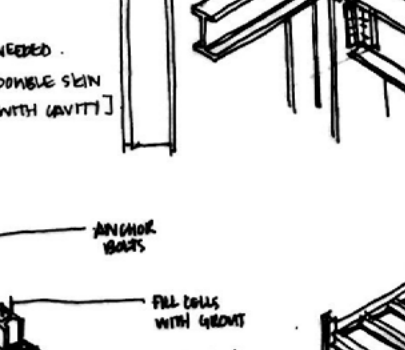
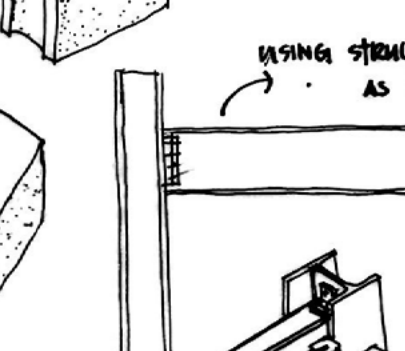
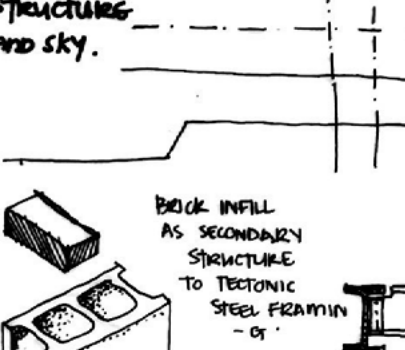
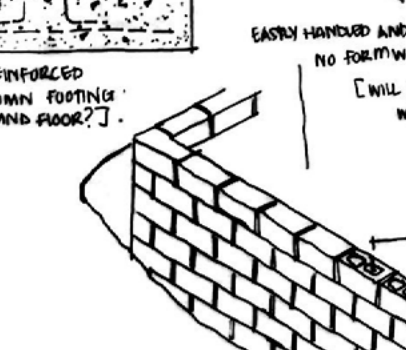
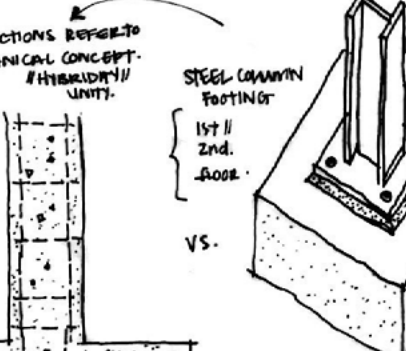
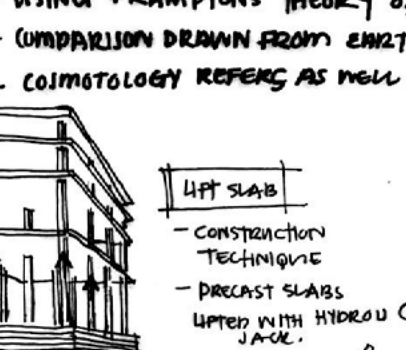
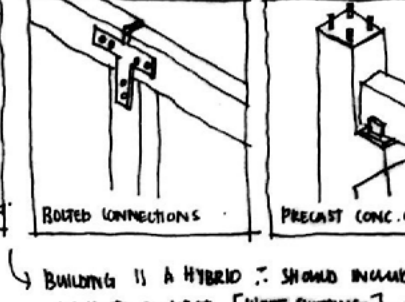
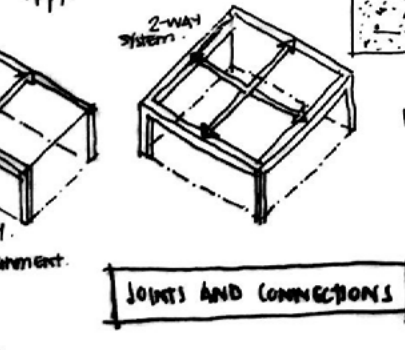
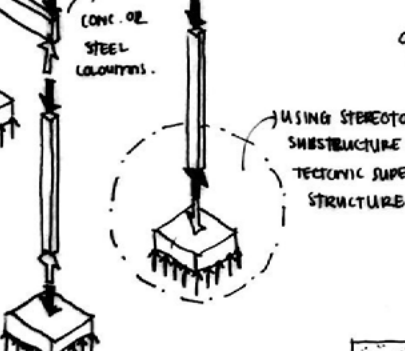
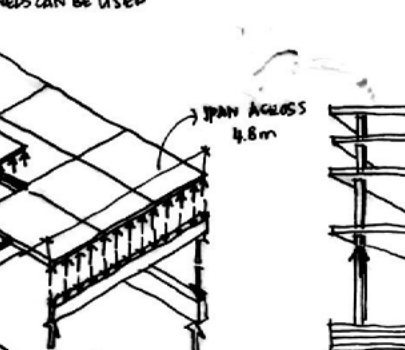
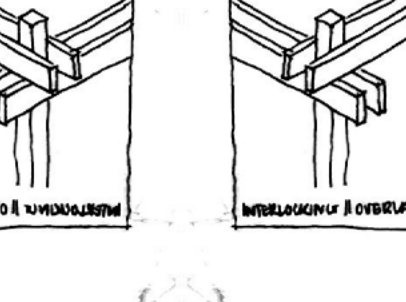
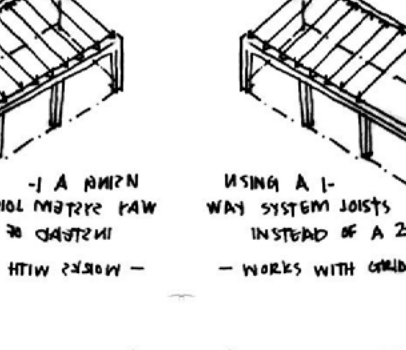
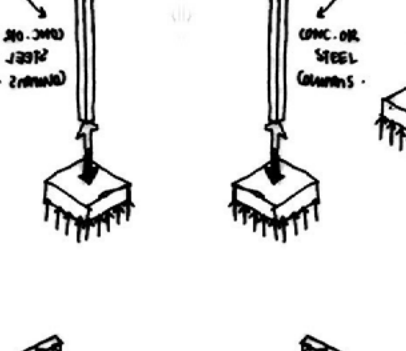
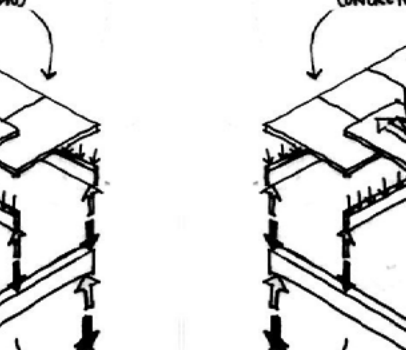
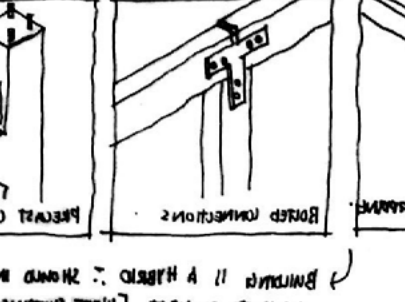
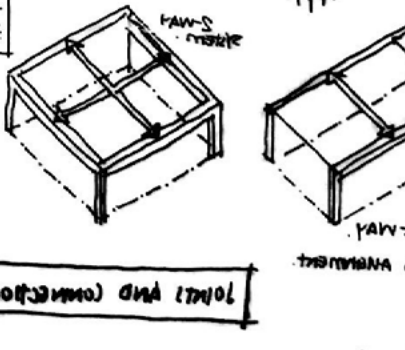
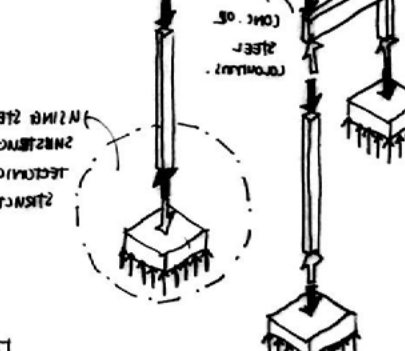
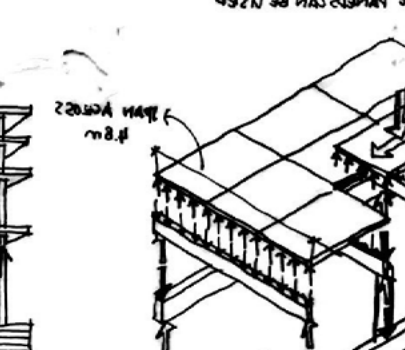
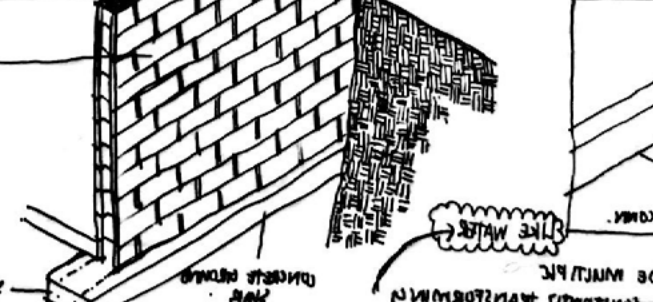
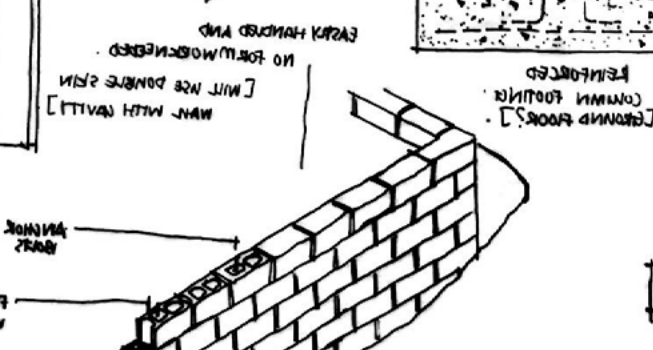
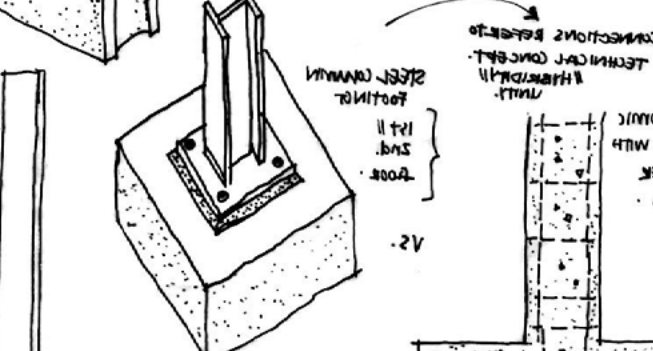
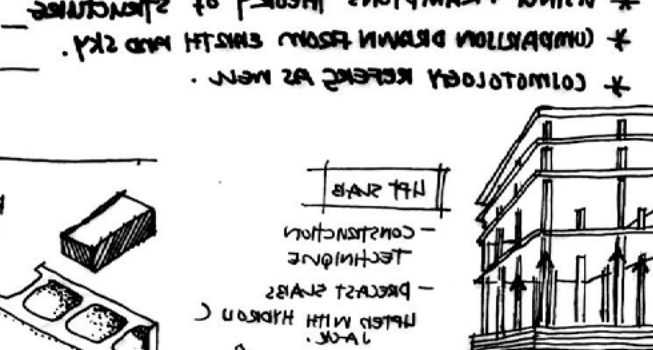
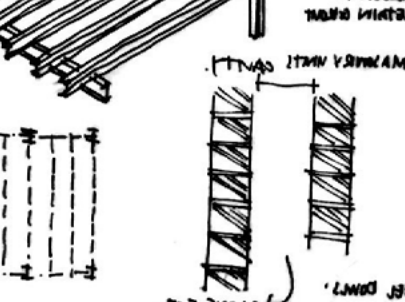
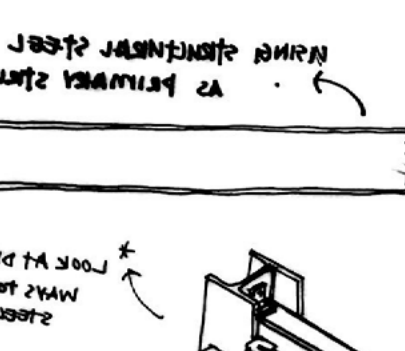
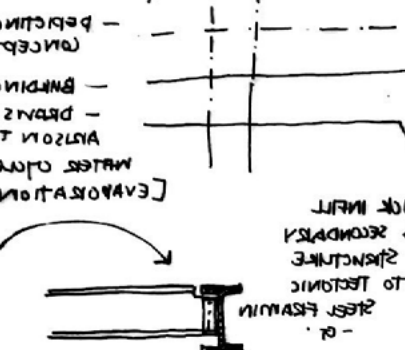
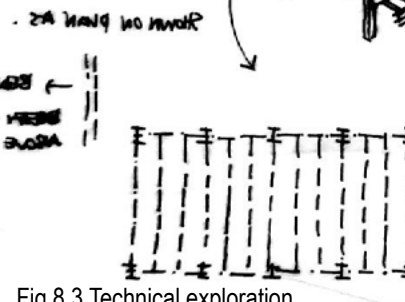
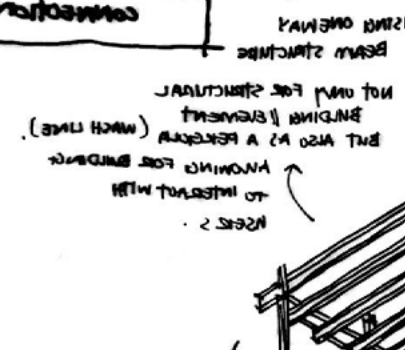
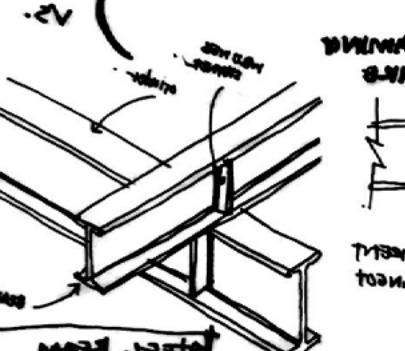
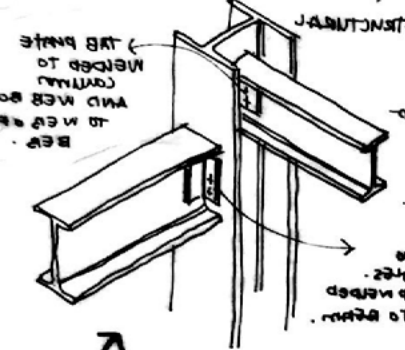


Fig 8.3 Technical exploration

STRUCTURAL INTENTION

The technological **CONCEPT OF TRANSITION** is applied in the structural intention through the exploration and illustration of the similarities that lie between nature and man to further ignite their reconciliation. The structural intention builds on Kenneth Frampton's theories of structure and the idea of separating architectural composition into the stereotomic (solidity) and the tectonic (dematerialisation) by **drawing parallels from the structural anatomy of the body found in nature.**

The concept separates and compares the stereotomic mass, the primary structure, of the building to the Endoskeleton (internal support of the structure of an organism). Any cladding and secondary support systems become the analogy of the body's tissue, while the tectonic elements and tertiary structure of the architecture becomes an analogy of the Skin and the Exoskeleton (a complex rigid outer covering of an organism which protects the muscles and soft tissues inside) becomes the tertiary structure of the building.

Fig 8.4: Illustration of internal anatomy of a turtle showing endoskeleton, body tissue, exoskeleton and skin.

EXOSKELETON

An exoskeleton is the external skeleton that supports and protects an animal's body, in contrast to the endoskeleton, it can be referred to as the "shell".

The exoskeleton provides support for all the internal organs and tissues of the animal. It is also often flexible since it is not as solid as an endoskeleton. The exoskeleton is often flexible and light in weight which enables animals to easily move.

Examples of animals with exoskeletons include insects such as grasshoppers and cockroaches, and crustaceans. Some animals, such as the tortoise, have both an endoskeleton and an exoskeleton.

In the case of architecture, the exoskeleton is defined as the tertiary structure, the building skin.

STRUCTURAL MAKE-UP

The TERTIARY EXOSKELETON

The tertiary structure, the building skin, consists of glass, polycarbonate sheeting and vertical growing green planted "walls"/ screens supported by steel channels, mesh and cables.

The SECONDARY TISSUE

The secondary structure consists of the combination of stone and brick infill with standing seam metal and lightweight concrete planted roofs.

The PRIMARY ENDOSKELETON

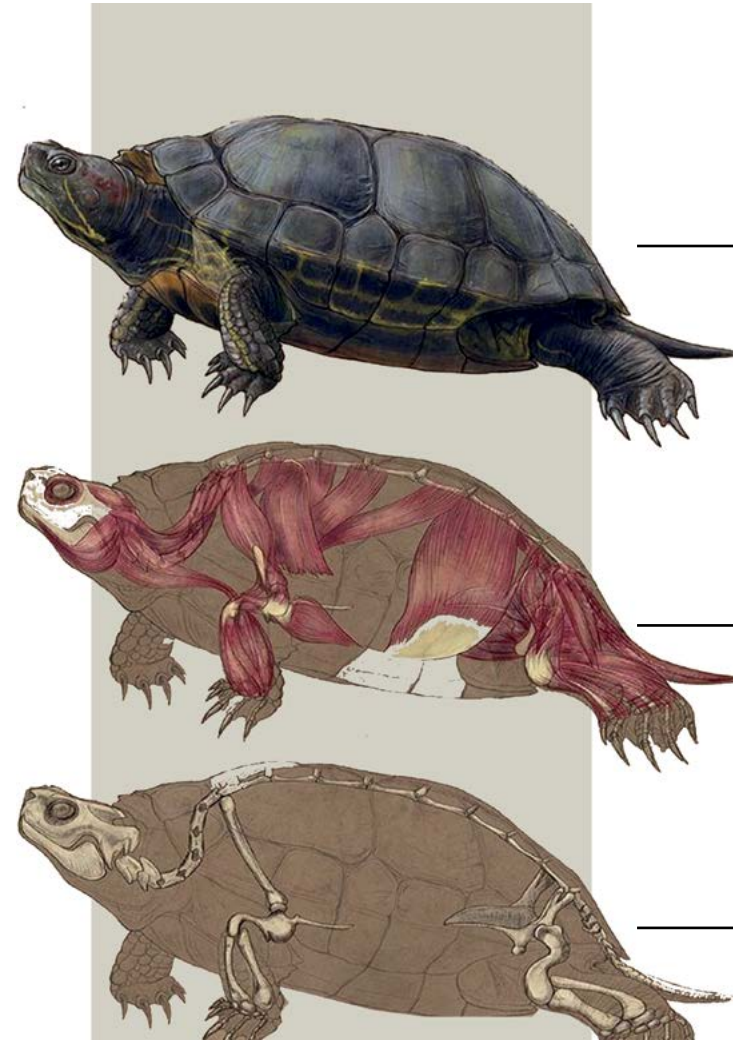
The primary structure is articulated as a hybrid architectural structure comprising of a structural steel frame support system resting on the combination of concrete floors, construction footings and a submerged tanked basement construction.

ENDOSKELETON

An endoskeleton is a skeleton found within the interior of the body; it provides structural support and protection for the internal organs and tissues of an organism.

This bony skeleton allows vertebrate animals to grow large in size, as it provides enough support to hold considerable weight. An endoskeleton enables movement by providing bony surfaces for muscle attachment.

In the case of architecture, the endoskeleton represents the building core and structural support system.



Drawing parallels from the structural anatomy of the body found in nature.

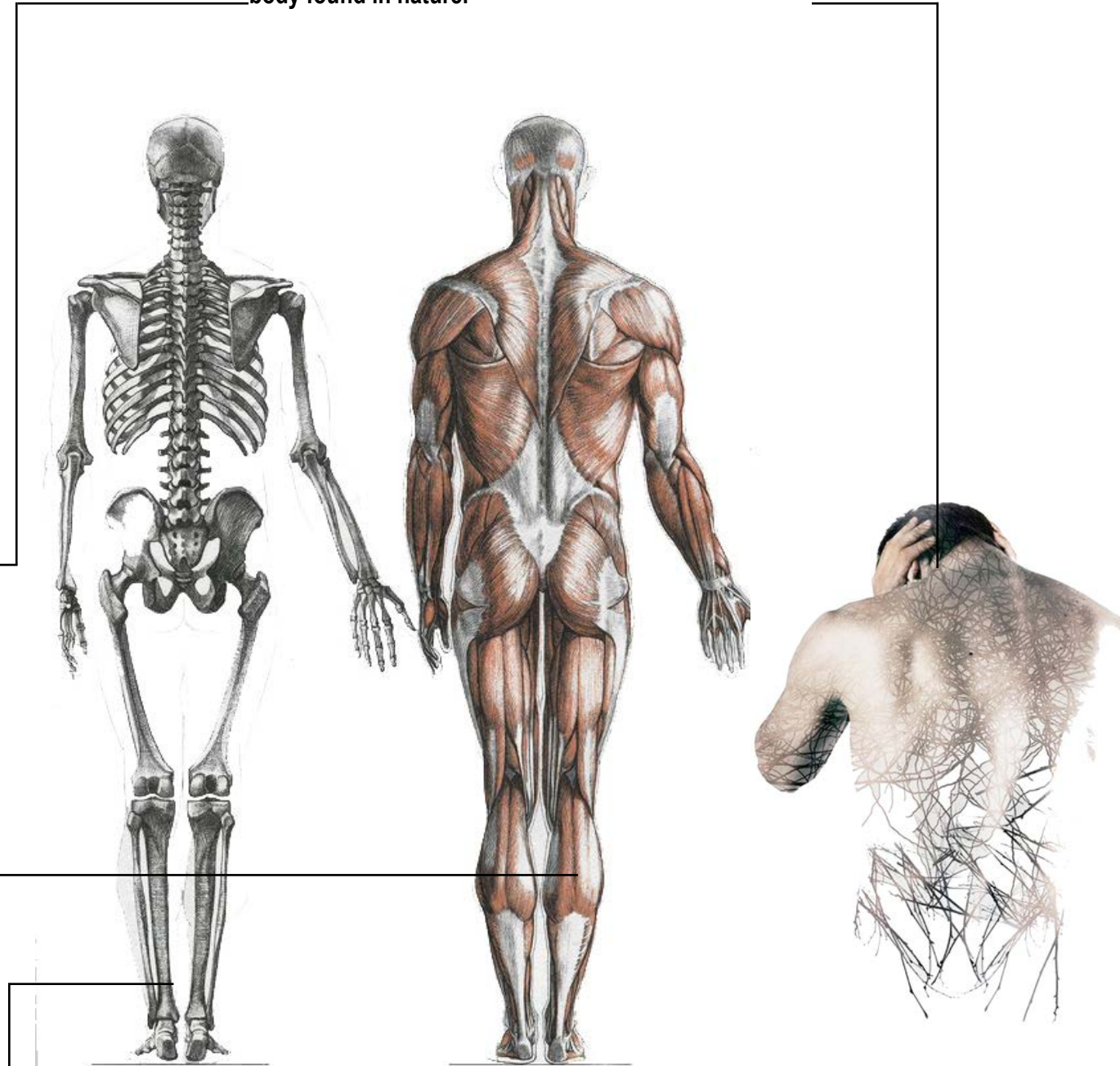
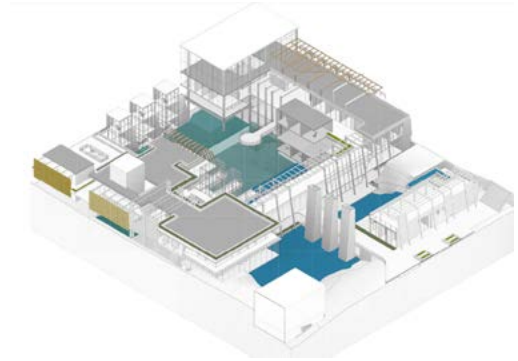
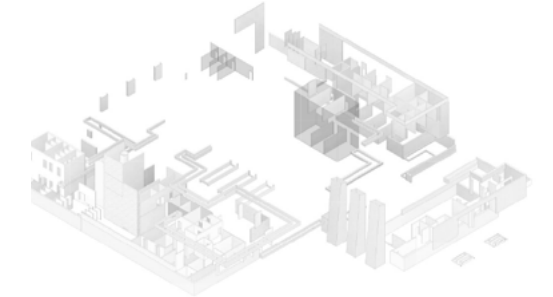


Fig 8.5: Illustration of the human endoskeleton.

Fig 8.6: Illustration of the human tissue

Fig 8.7: Illustration of the human tissue

STRUCTURAL MAKE UP



SKIN AND EXOSKELETON

The skin is defined as the thin outer layer that covers the whole body. It is continuous, flexible and changes colour, thickness and elasticity at different parts of the body. It acts firstly as a protective layer, secondly as a regulator of the temperature, thirdly as an excretory organ and fourthly as a tactile and sensory organ in which nerves end. **Due to its protective nature, the idea of the human skin is used together with the exoskeleton.**

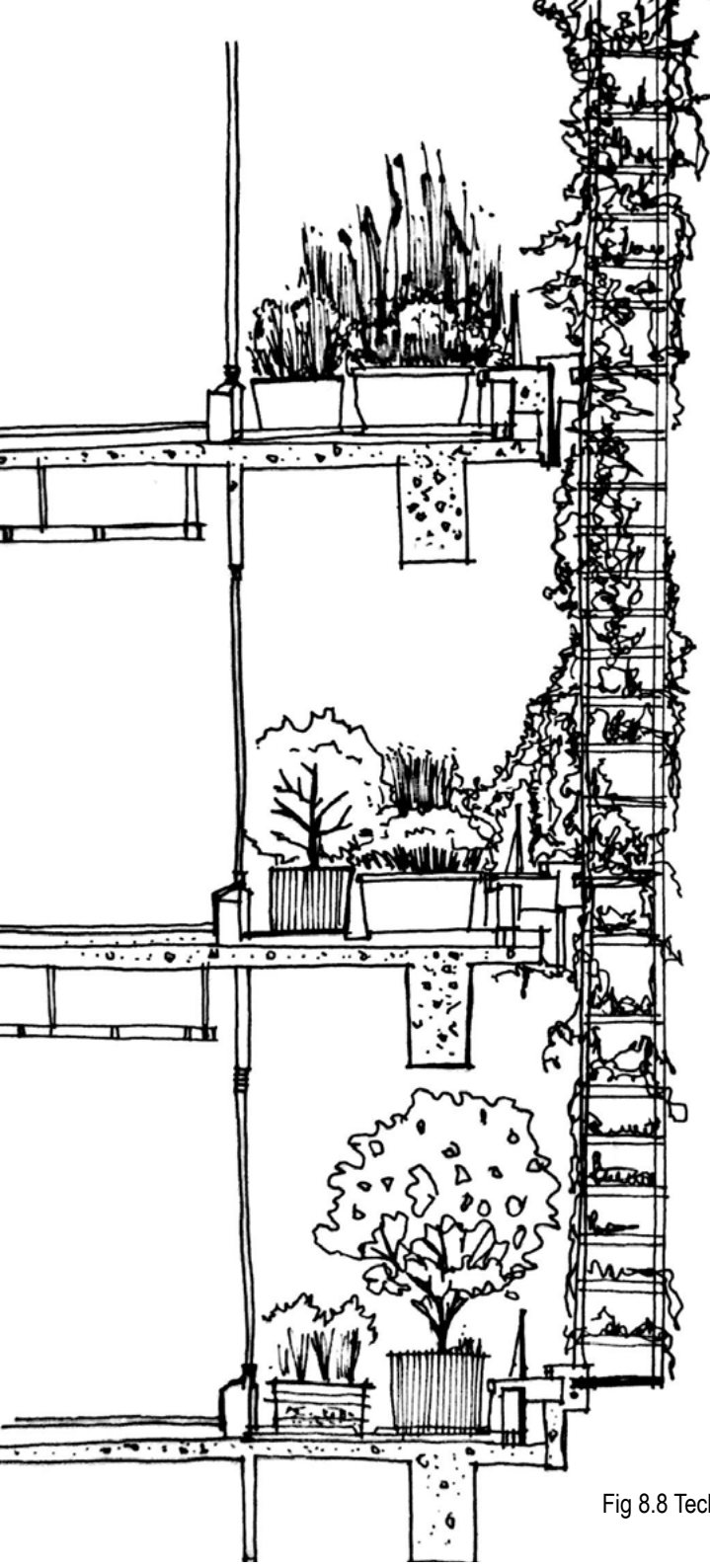


Fig 8.8 Technical exploration of planted building skin

MATERIALITY

The technology and response of Le Guérisseur is a direct response to its surroundings. As the context made up of an excavated natural landscape with a rich cultural and heritage history, the site's existing materiality was understood in its altered contemporary state.

The materials will be chosen based on their structural and aesthetic parallels derived from nature so they can appropriately convey the technological concept, merge with the surrounding urban and natural context, while subtly contrasting the existing historical structures, therefore contributing to adding a new layer and spatial language to the rich architectural landscape of Trevenna.

The new materiality of the building intends to form a poetic dialogue with the site, which intends to create a narrative between the architecture and landscape, emphasising their interdependence.

The material was selected and divided into three categories to illustrate their tectonic intentions, synthetic materials, and hybrid qualities and joinery.

Through the hybridity of the buildings materiality the architecture intends on illustrating the different processes found in nature to illustrate the concept of biophilia.

Despite the programmatic structural hybridity, chosen materiality and finishes lend a uniform surface appearance, allowing for structural elements to merge into a single, integrated building.

Materials were also chosen for durability, for the ability to weather and for their transformation when exposed to water. The predominant materials found on-site would be water, concrete, brick, steel, stone, polycarb and glass.

MATERIAL PALETTE

The PRIMARY ENDOSKELETON

The primary structure is articulated as a hybrid architectural structure comprising of a structural steel frame support system resting on the combination of concrete floors, construction footings and a submerged tanked basement construction.

The SECONDARY TISSUE

The secondary structure consists of the combination of stone and brick infill with standing seam metal, timber clad wall and floors and lightweight concrete planted roofs.

The TERTIARY EXOSKELETON

The tertiary structure, the building skin, consists of glass, polycarbonated sheeting and vertical growing green planted "walls"/ screens supported by steel channels, mesh and cables.

CONNECTIONS



Timber



Glass



Weathered Steel



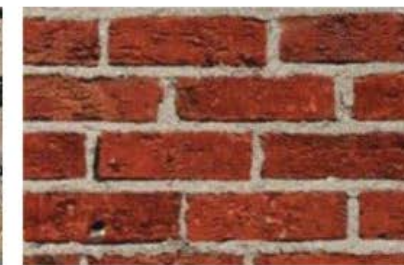
Concrete



Gravel



Stone



Clay Bricks



Steel



Water



Algae



Aluminium



Vegetation

Fig 8.9: Material palette

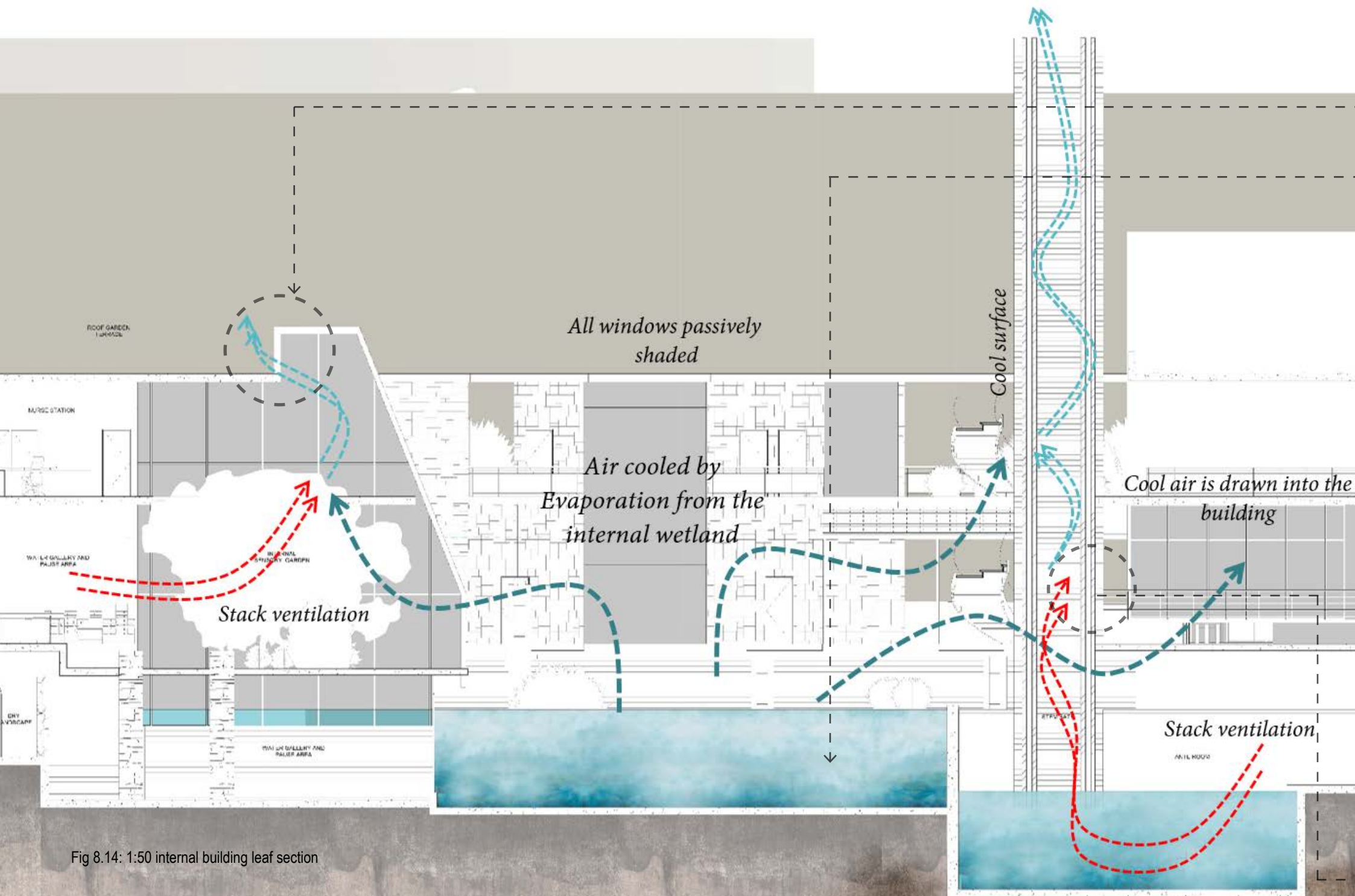


Fig 8.14: 1:50 internal building leaf section

VENTILATION

Due to the building been designed around a central water courtyard, the building uses direct evaporative cooling as its primary ventilation system. The evaporation of the wetland helps to passively cool the building, by reducing the need for air conditioning. with the combination of other passive design techniques, efficient thermal comfort can be achieved.

Cooling is induced during the evaporation process in the internal water courtyard and does not elevate the indoor humidity levels at all. This ventilation system cools the air on the internal building envelope and brings the cool air in the oncology centre.

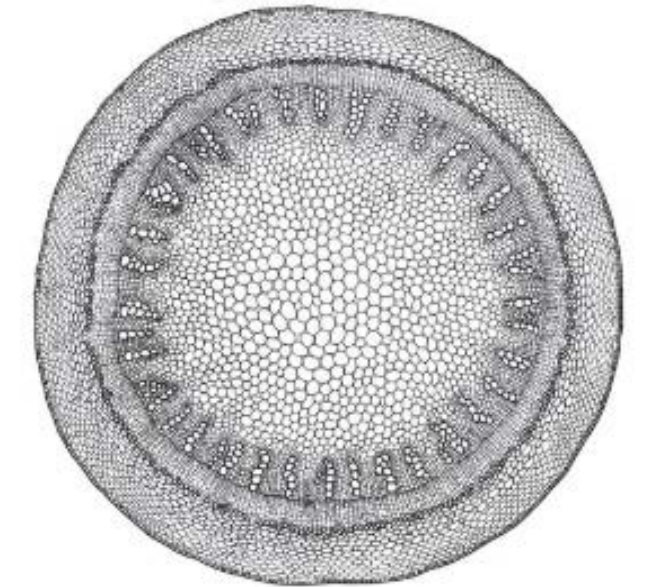
Stack ventilation is used in building interiors, underground hydro chambers and towers. Stack ventilation uses various air temperatures to move air. The building uses geothermal pipes to allow cool air to enter the building through low inlets, while outlets are put at the highest points in the building to allow for hot air to exit (Ismail, Malek and Rahman, 2012).

STEM BATH

The stem bath is the only hydro chamber tower with a closed ecological system, unlike the other 3 towers, the stem bath has a mixture of herbs and moss growing on the interior leaf of its concrete walls. Due to the temperature of the water, hot air rises through the chamber and into the tower, condensation occurs on the inside of the concrete wall, the water drips back down onto the plants falling back into the bath like rain.

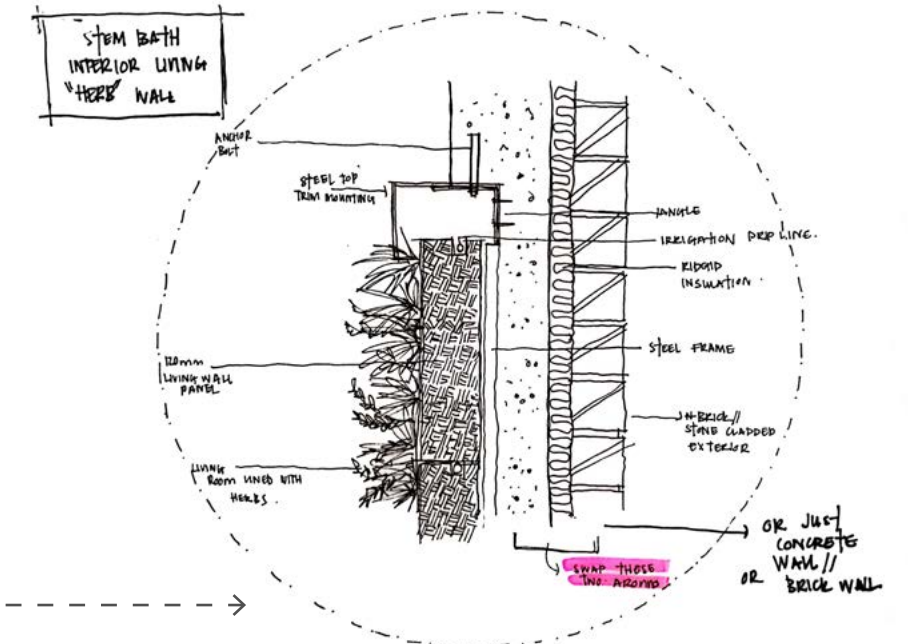
Due to the perforation of the concrete walls, circulation on the exterior walls and the tower being opened at the top, the herbs are able grow in the chamber, get enough sunlight and be maintained. The aroma of the of the stem bath gets filtered through the perforated walls and into the internal courtyard.

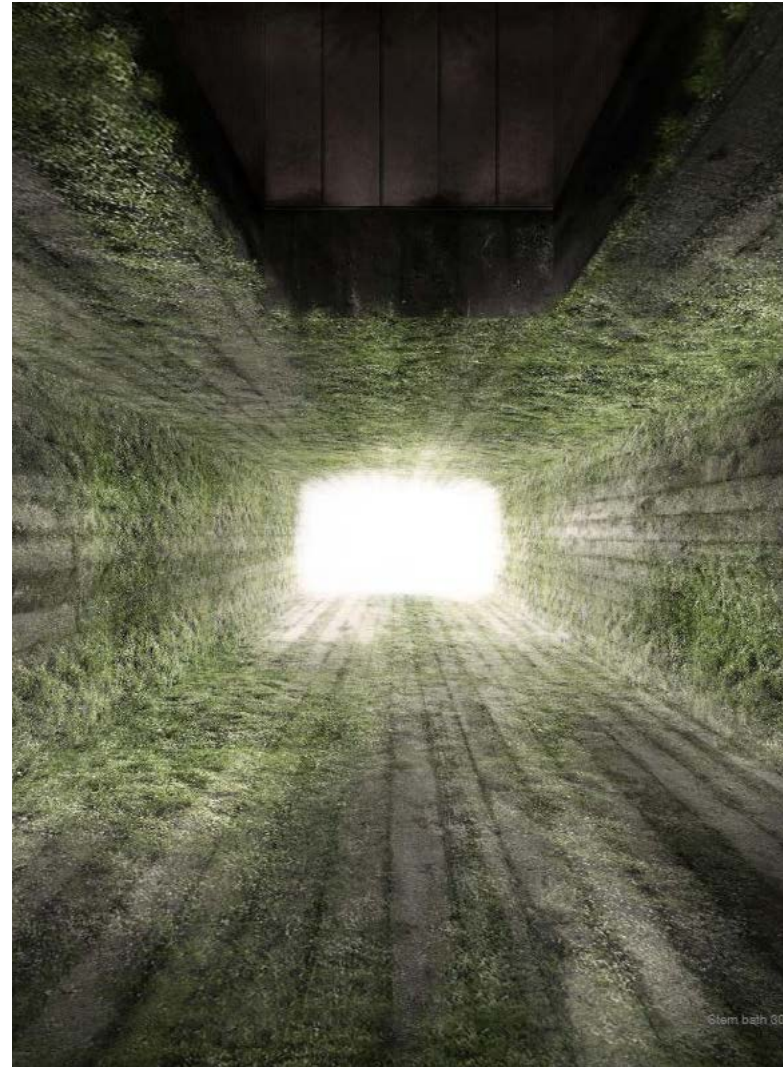
Fig 8.15: Detail section of Stem bath interior living wall



CROSS SECTION OF STEM BATH

Fig 8.16: Cross section of stem bath (Cho,2014)





INTERIOR OF STEM BATH
 Fig 8.17: Interior of stem bath (Cho, 2014)

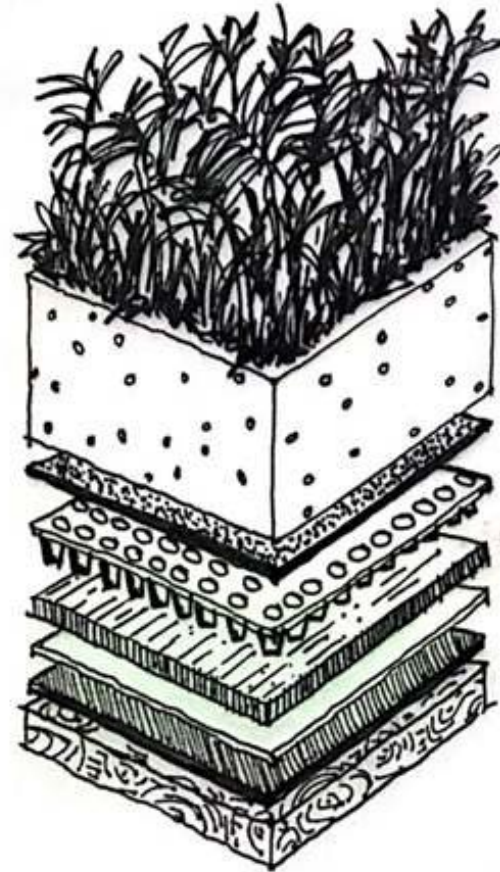


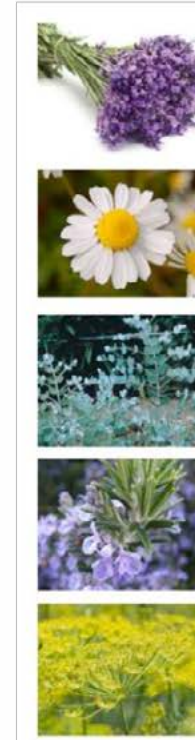
Fig 8.18: Axonometric of Planting bed

PLANTING

HEALING PLANTS

The relationship between herbs and bath are inseparable. With addition of herbs, a bath of hot water can become something special. It will give olfactorial identification, and healing property such as reduction of stress level, and providing a relaxing experience to everyone.

Herbs used in bath will be harvested from herb gardens on the roof and ground floor. Then they will be dried in the drying room or through the furnace.



- Lavender**
 Baths filled with lavender herbs are used in restoration of energy, as a sedative, as well as a tool to reduce blood pressure.
- Chamomile**
 Chamomile is used for rheumatism, gout, neurosis, spastic bowel conditions, weeping eczema, septic sores, diseases of female genital sphere, hemorrhoids.
- Eucalyptus**
 Eucalyptus has a distinctly clean, fresh flavor of menthol, which is refreshing and flavorful at the same time. It is good for chronic and back pain and tired muscles.
- Rosemary**
 Rosemary excites and stimulates the nervous system. It is used to relieve headaches, migraines and muscle pain.
- Fennel**
 Fennel bath helps to fix a bloated stomach, excess wind, colic, constipation and other digestive problems.

Fig 8.19: Healing plant palette (Cho, 2014)

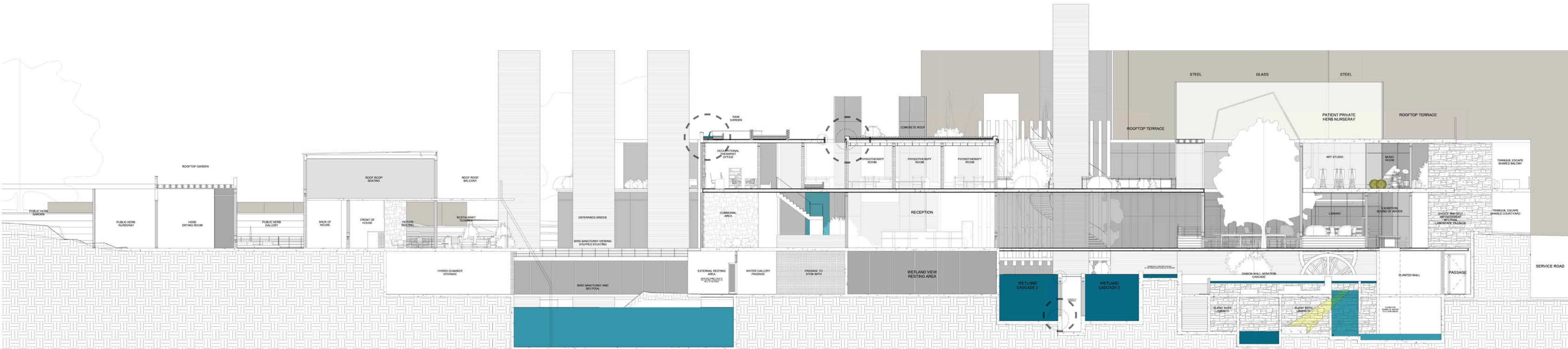


Fig 8.20: Long Section

SECTION BB - SITE
SCALE: 1 : 100

DETAILS

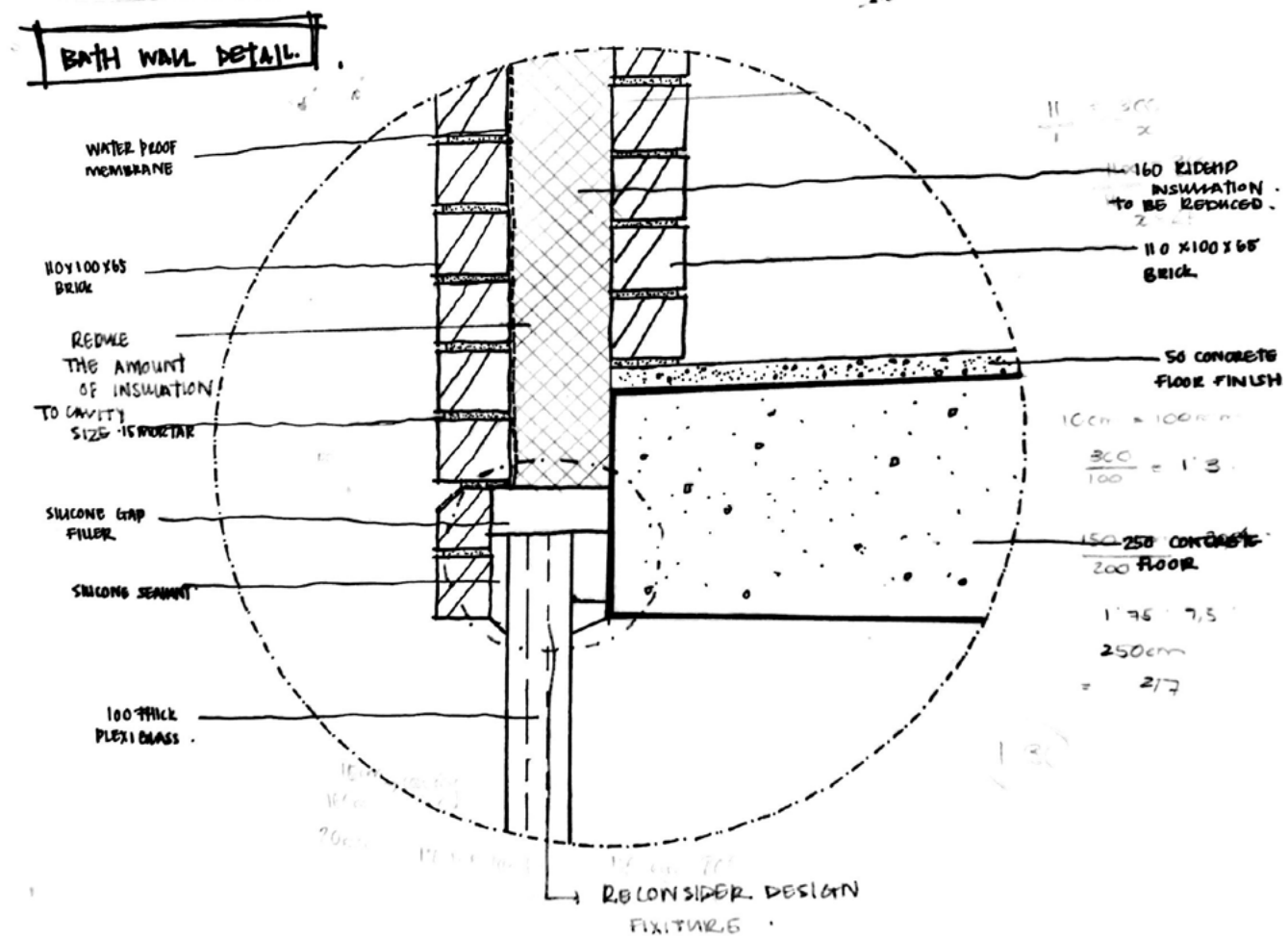


Fig 8.21: Bath Wall Detail

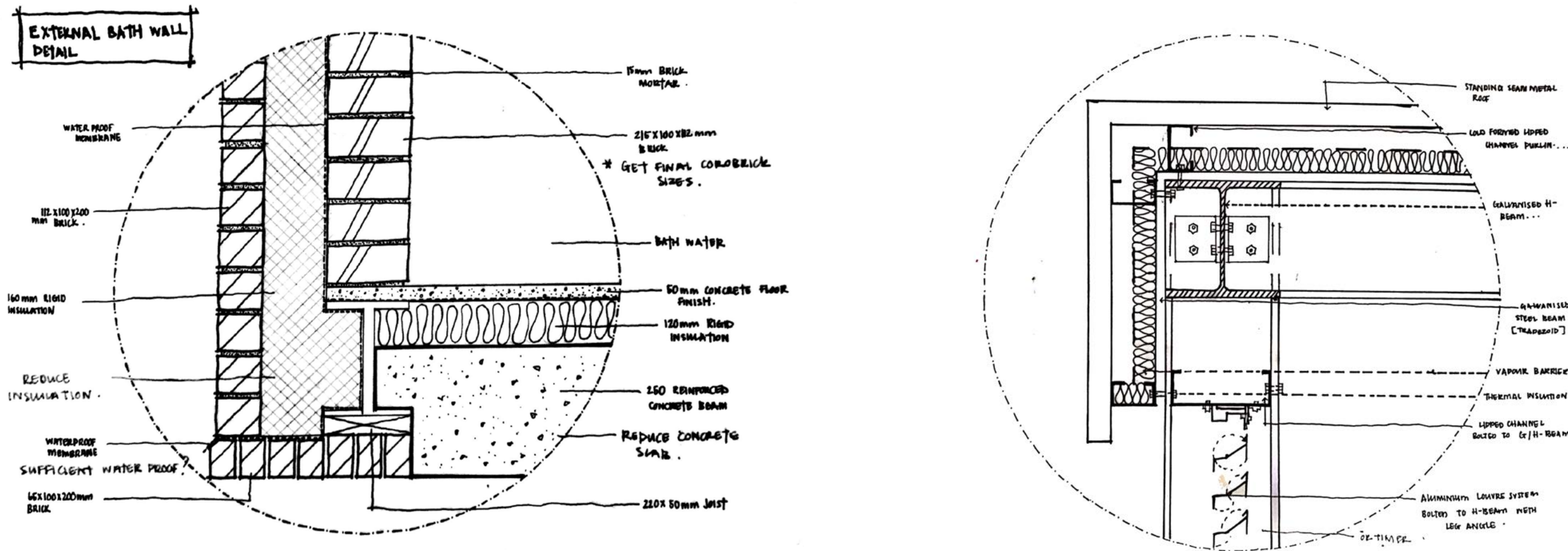


Fig 8.22: External Bath Wall Detail

Fig 8.23: External Bath Wall Detail

DETAILS

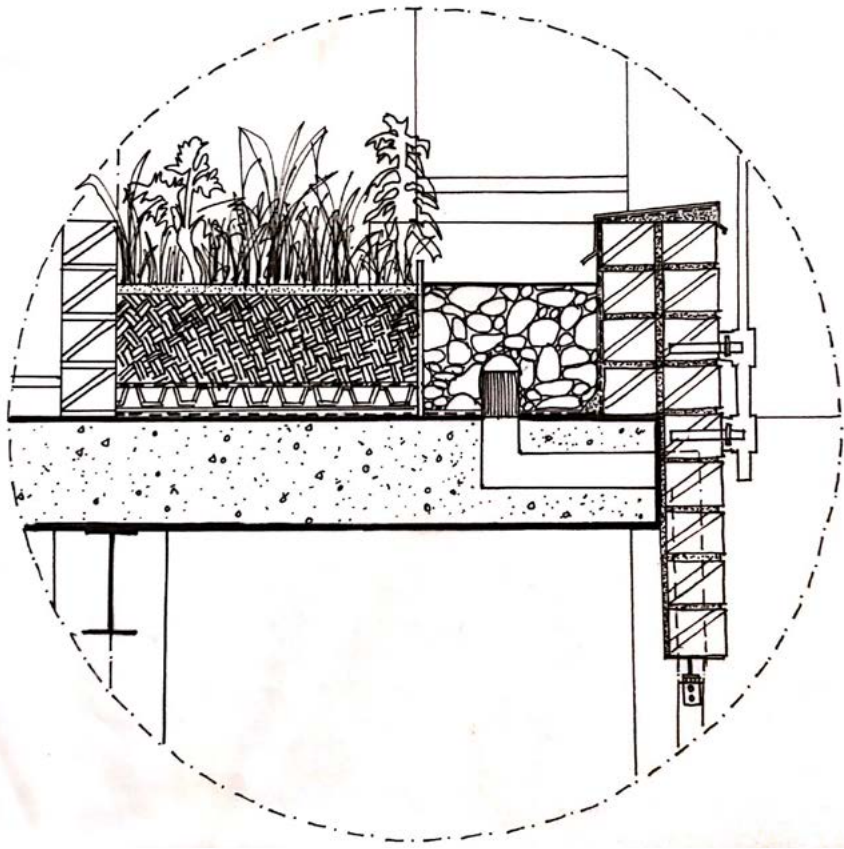


Fig 8.24: Roof Garden Detail

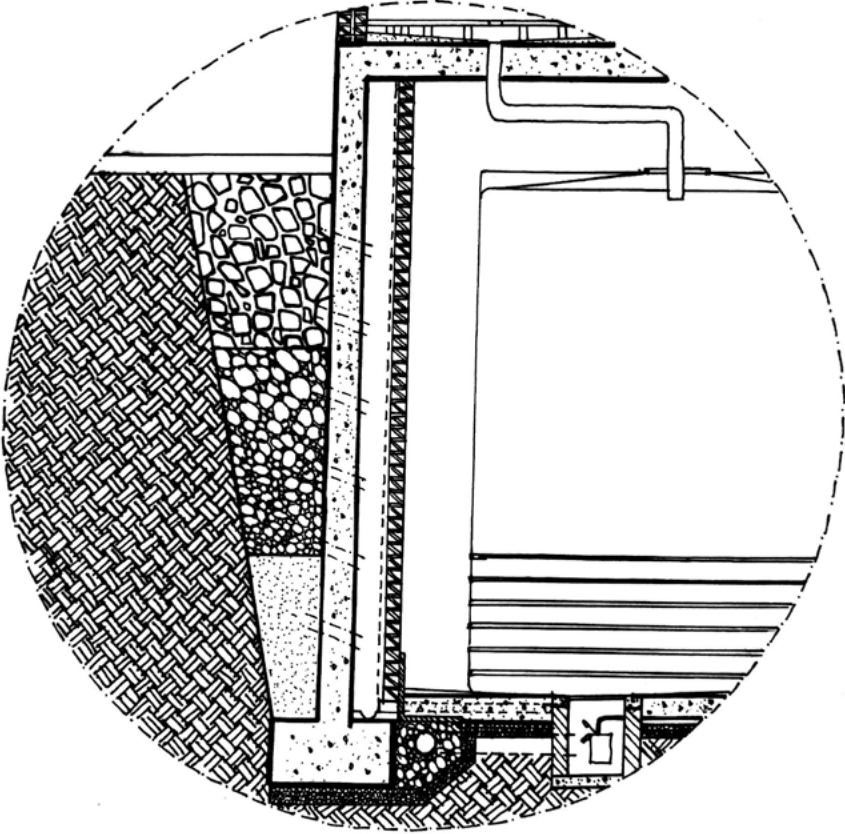


Fig 8.25: Basement Storage Tank Detail

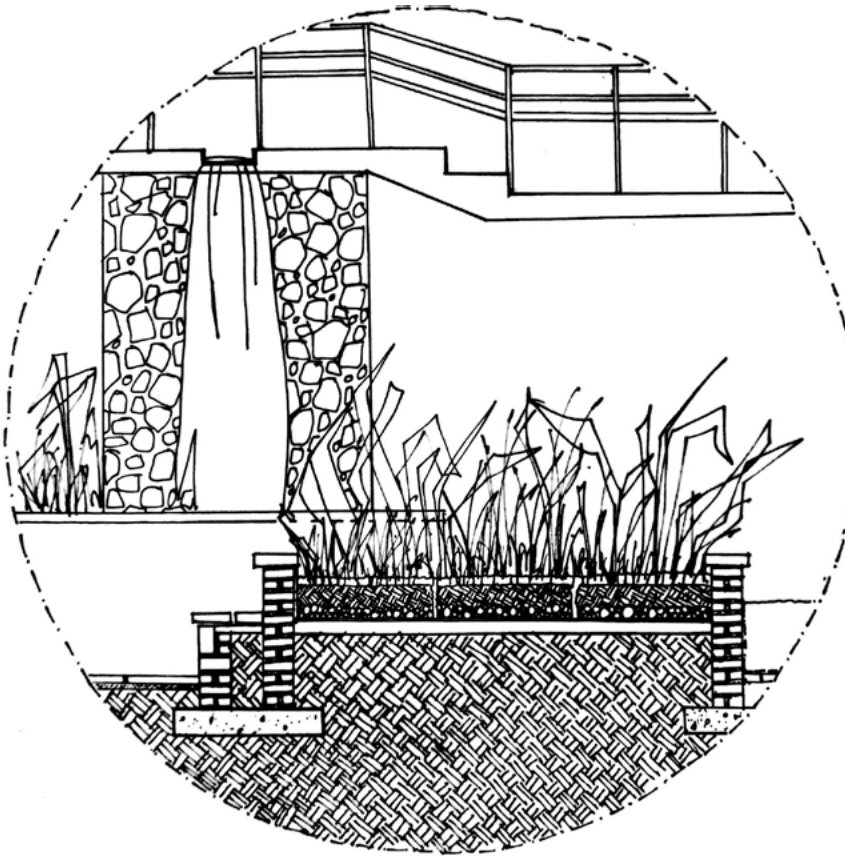


Fig 8.26: Rain garden water feature Detail

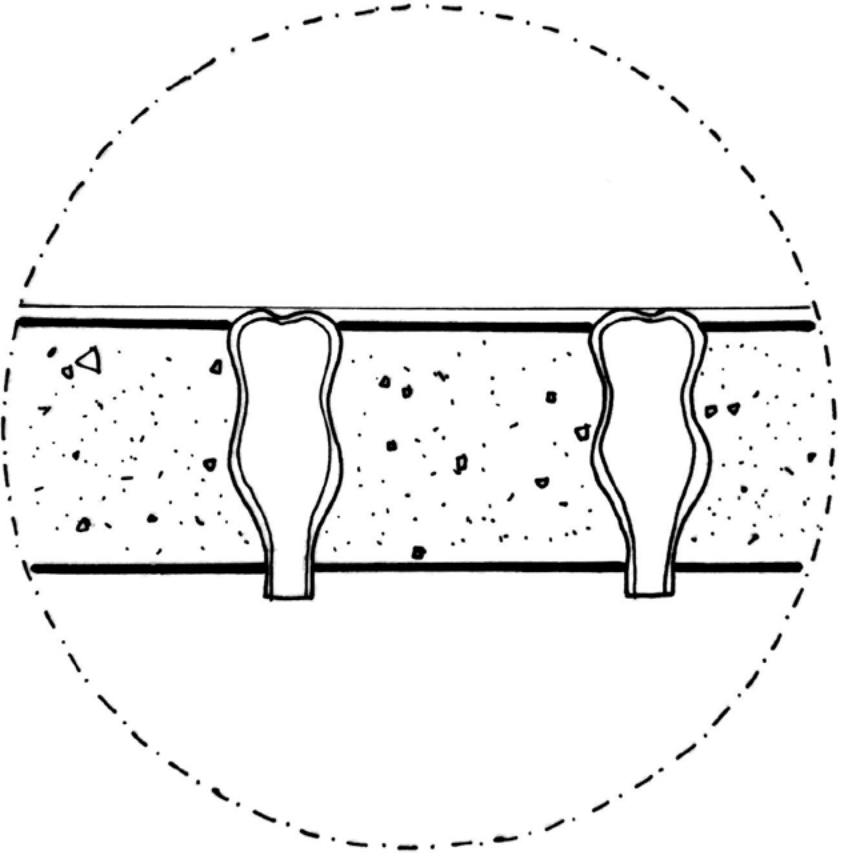


Fig 8.27: Recycled glass bottles cast into concrete detail

1:20 SECTION OF THE FOG TOWER

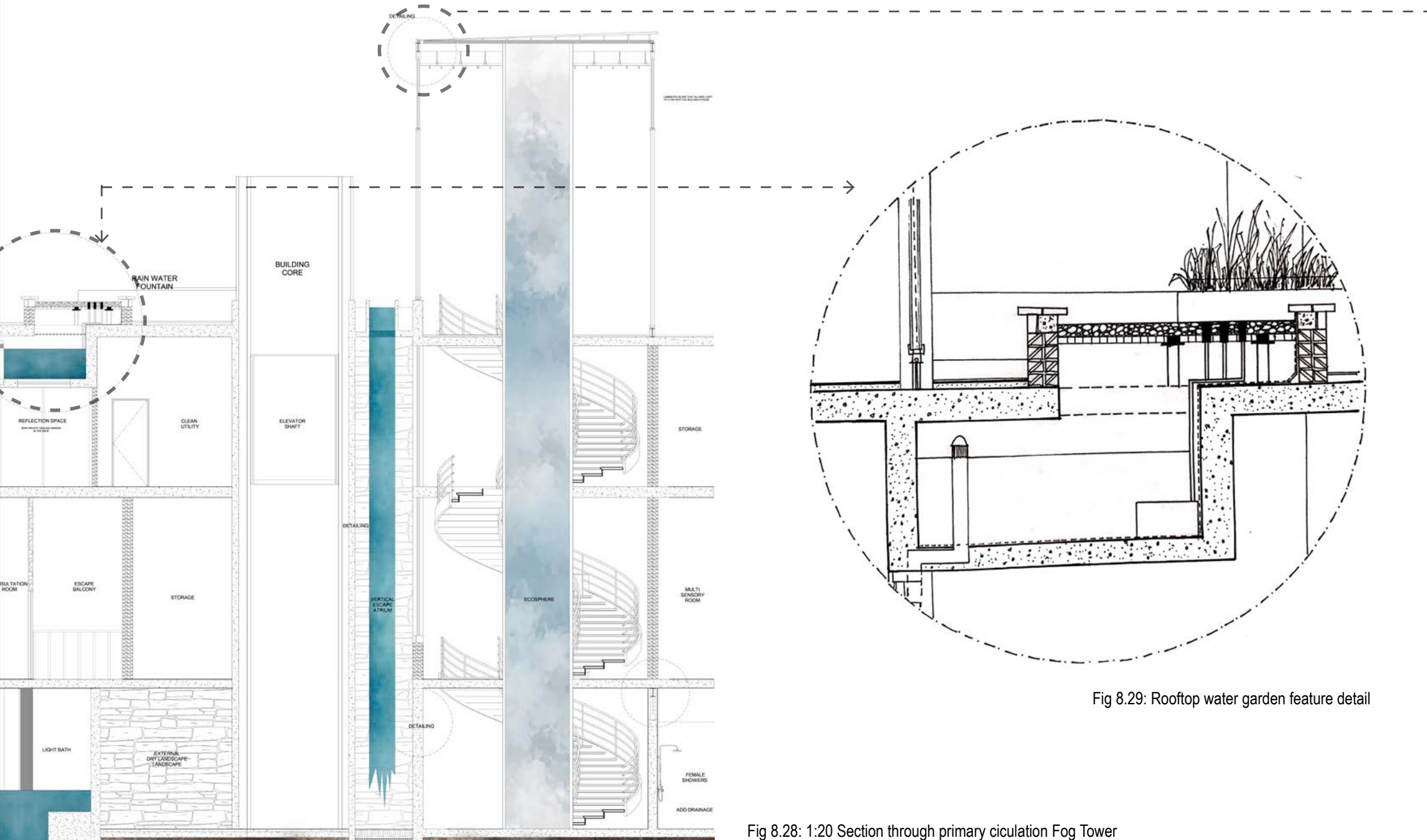


Fig 8.28: 1:20 Section through primary circulation Fog Tower

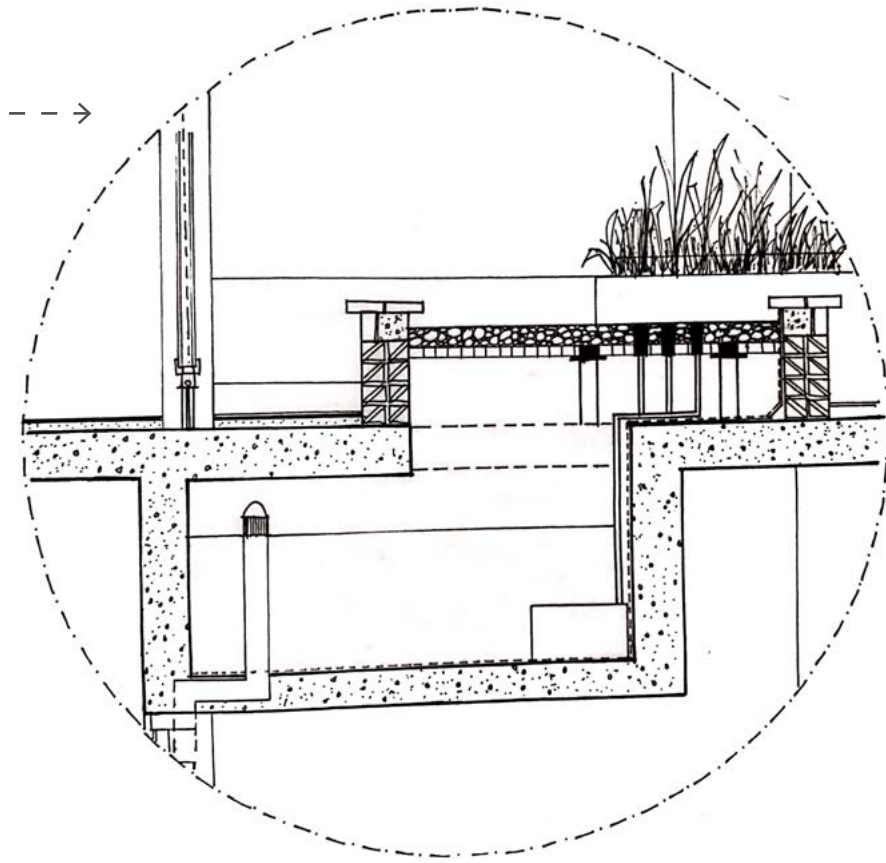


Fig 8.29: Rooftop water garden feature detail

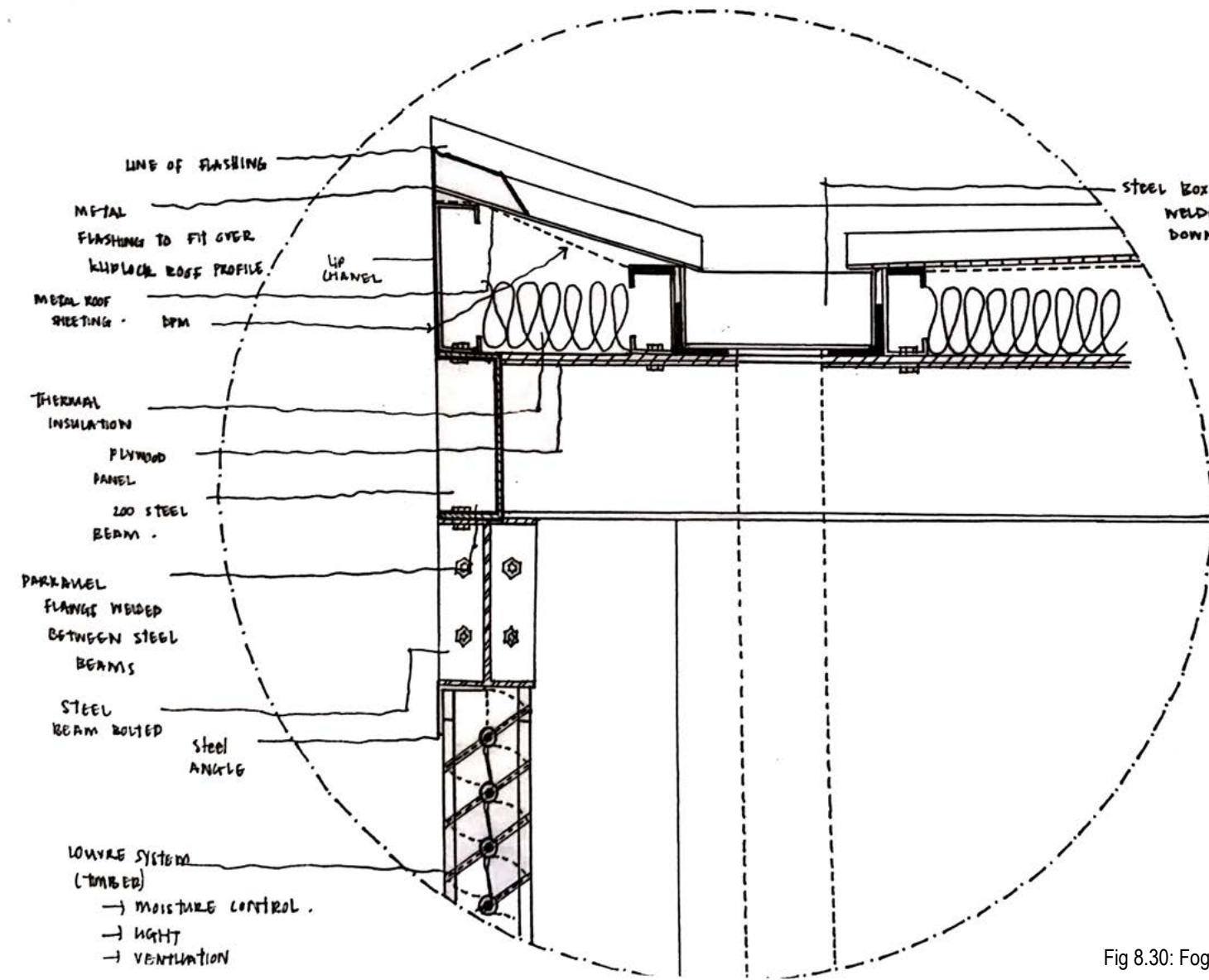
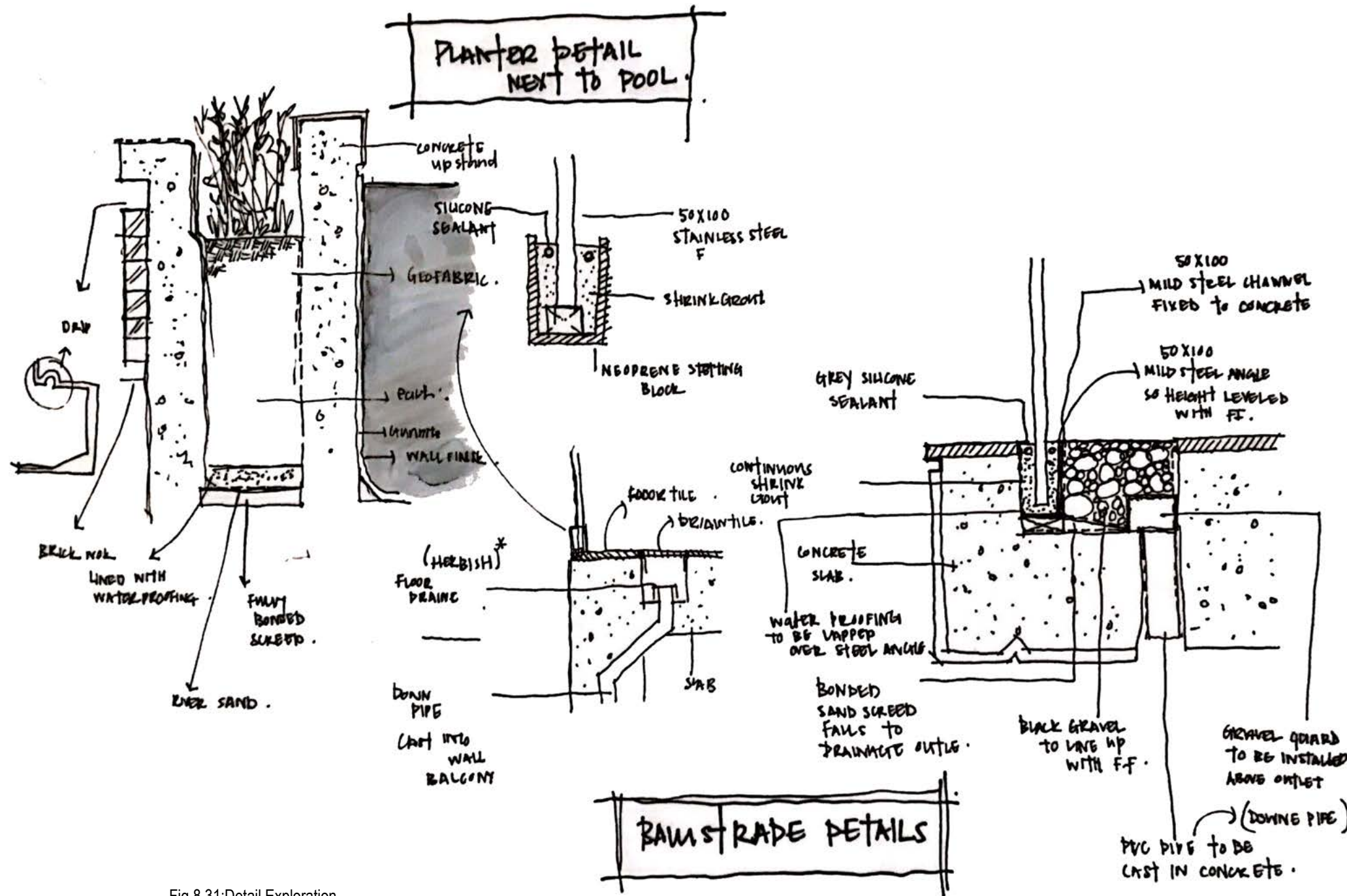


Fig 8.30: Fog tower roof detail

THE FOG TOWER

The Fog Tower is the large atrium space where visitors enter the circulation centre engulfed with fog mass as they move throughout the building. A spiral staircase is used not only for circulation but also represents the spiral movement of water. The spiral staircase is wrapped around an ecosphere. A waterproofed structural round glass cylinder used to store water and or aquatic life. The sense of physical suspension is heightened by the occasional release of fog mist.

Visual and acoustic references are erased along the journey towards the top, leaving only an optical white-out and white noise of pulsating water.



INVESTIGATION

- USING LIGHTWELLS
- VENTILATION
- ROOF DESIGN
- WATER RUNOFF.

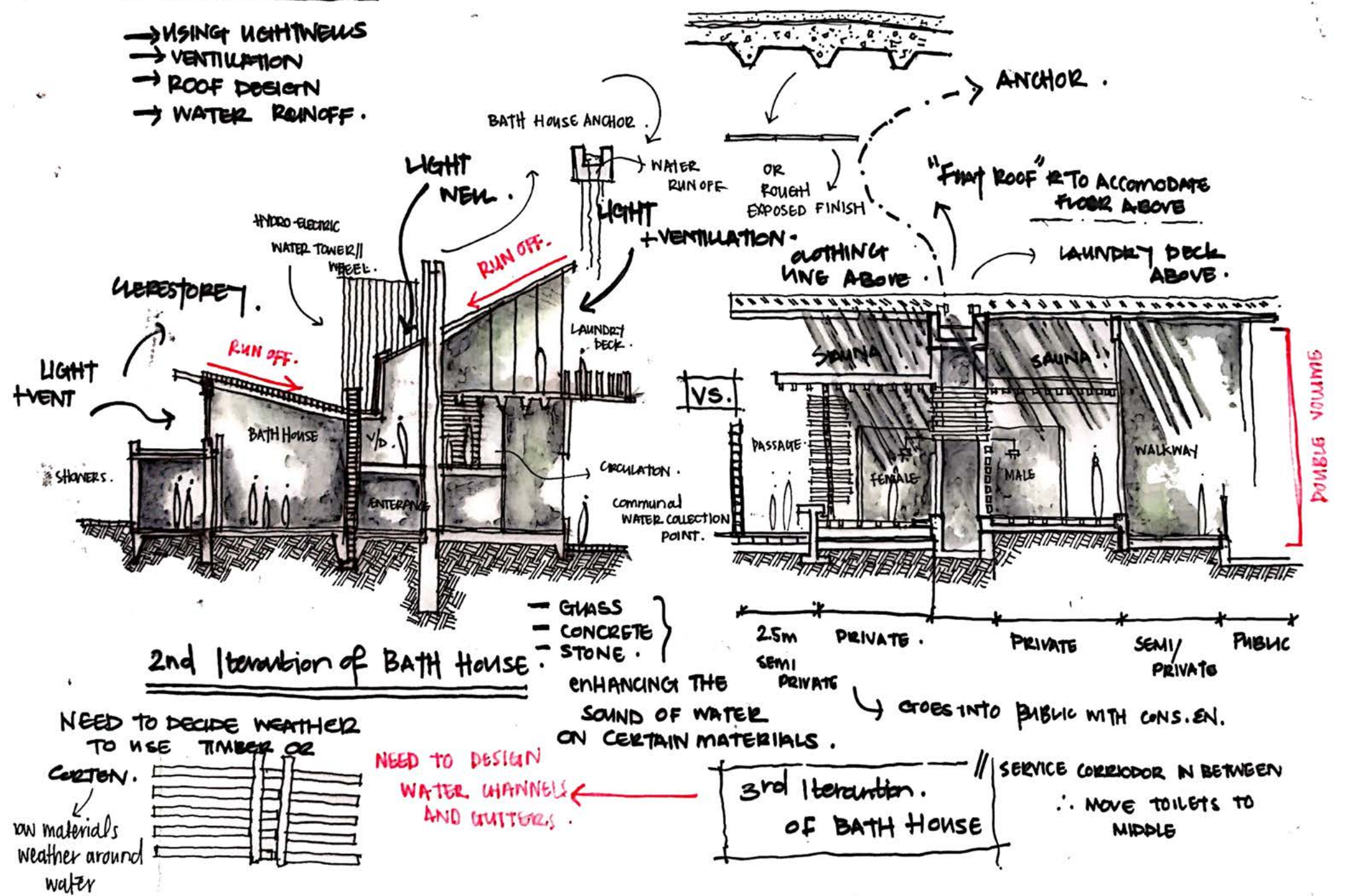
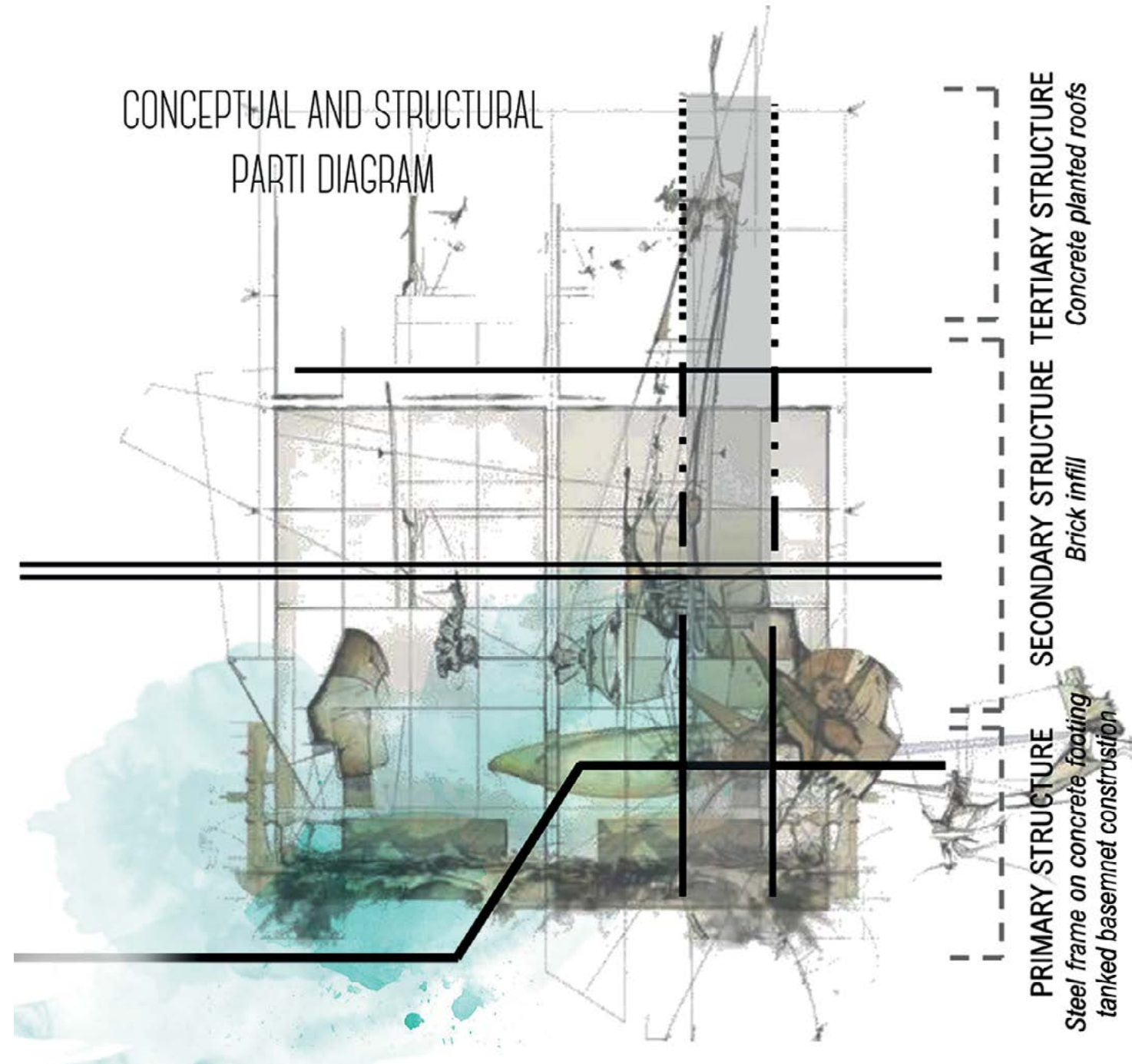


Fig 8.31: Detail Exploration

The structural make up of the building starts to break free from the water and "disintergrate" into the sky

Fig 8.10: Technical concept parti diagram



INTERACTION WITH WATER

The building encompasses large amounts of water. The building encompasses large amounts of water, which is unevenly distributed between the four floors according to user interaction, levels of healing and public and private spaces. Due to the integral role of water in the design of the building, the structural intention further draws parallels from the from the water cycle, specifically focusing on the process of evaporation by comparing stereotomic mass to water while the tectonic elements of architecture become an analogy of the water droplets transitioning into the sky. The stereotomic elements enclose large amounts of water whereas the tectonic elements are used to enclose smaller amounts of liquid based processes.

Furthermore, tectonic steel frames are used to define spatial representations of private space. Therefore, like water evaporation, the structure

of the building starts to visually disintegrate into the sky. The higher you go up in the building the less amount of water the user interacts with and the more private the experience. The water found will not only be treated for any contamination, but also be used as a significant tool, a catalyst, in the remediation of the scared landscape.

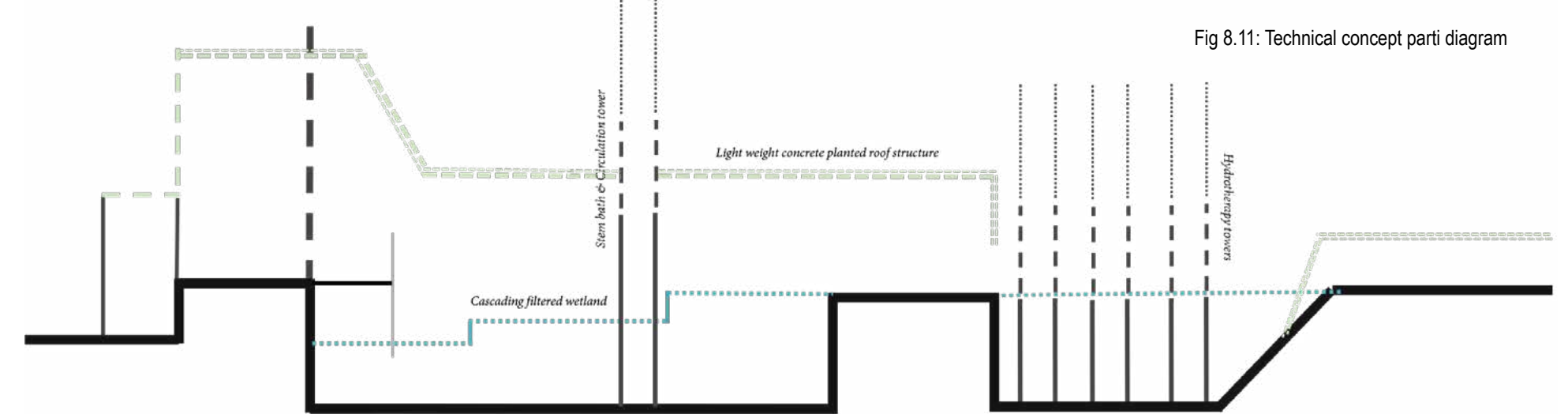
By exposing this natural element as an architectural device, hydrology becomes an embedded layer in the building and the human environment with the potential to implement cohesive interventions that seek to replenish and initiate the regrowth of vegetation, natural ecosystems, processes, patterns and organisms that were once destroyed.

Water is therefore used to therefore transform the site from an "Urban Void" to the "Urban Garden" connecting it back to the inner city's new "green link" framework. In doing so, through the design of the hydrotherapy cancer treatment facility, water becomes the physical and spatial healer of the

site with its use centred around its therapeutic qualities, harvesting, reticulation and restorative abilities for both its uses and the physical landscape.

Water is used to create a spatial atmosphere that provides an immersive and constantly changing spatial experience with the ability to induce an intricate and effective healing environment for both patients and the city. As it is celebrated through the public realm, the poetics of water are visibly enhanced, and its meaning in the urban environment is therefore strengthened.

Fig 8.11: Technical concept parti diagram



WATER MANAGEMENT & SERVICES

Due to the nature of the site and the programmatic use of water, hydrology and water management becomes a vital part of the scheme's concept as well as its feasibility.

Although the project is heavily water-dependent, the collaboration with the landscape allows for all the demand of the treatment centre to be sourced from a combination of harvested ground water, storm water runoff from the Urban Garden filtered through the man-made wetland system, rainwater purification and recycled grey water, augmented by municipal water supply as a secondary source of water.

All wastewater will be diverted to the municipal sewer system. The intent is to provide an efficient and not necessarily self-sufficient system.

FILTRATION

STORM WATER WETLAND FILTRATION SYSTEM

This filtration process uses a sequence of filters to remove micro-particles from the water.

1. The storm water runoff from the terraced urban garden first goes through a series of rain gardens to reduce the speed of flow before entering the wetland filtration system.
2. Once the water enters the primary wetland cell it is directed through a coarse sand filter. The cell is filled with ornamental plants, designed to eliminate any latent mineral nutrients and offering a habitat for the bird sanctuary and aquatic life.
3. The water is then aerated through a cascading gabion wall into the secondary wetland cell naturally inducing oxygen into the water flow to accomplish iron oxidation and the reduction of dissolved gasses.
4. The water is then directed through a perforated pipe inlet to a primary UV treatment system to purify and remove pathogens.
5. From the UV cell, the water is then directed through a sand-granular activated carbon (GAC) also known as a charcoal filter where it is further cleansed. No chlorine is used as the water

then cascades into two bio-pools that consist of plants.

6. The water is now purified enough for human use and is cascaded into a bio-pool that are used for recreational activities such as swimming and fishing. The cascading movement not only aerates the water but also creates white noise, masking any unwanted sounds that might occur natural in the environment; it is used as a veil establishing different levels of privacy around the internal courtyard of the building and creates a tranquil atmosphere that is used to induce healing.

7. After exiting the bio-pools, the water then goes through a secondary UV and charcoal filtration system before it enters the building and is stored in the underground basement water tanks and distributed to basins, water closets and the hydrotherapy chambers.

GREY WATER SYSTEM

All grey water entering the basement storage is sent through an oil trap system that purifies the water and reticulates it back into the building for humane use. All water from ablutions, basins, showers and hydrotherapy baths are connected to this filtration tank. The oil traps stop any excessive build-up of grease and solidified oil from entering the weir. The water is then pumped into another storage tank that directs the water back

into the building and is also used for the irrigation of the internal and external vegetation in the building.

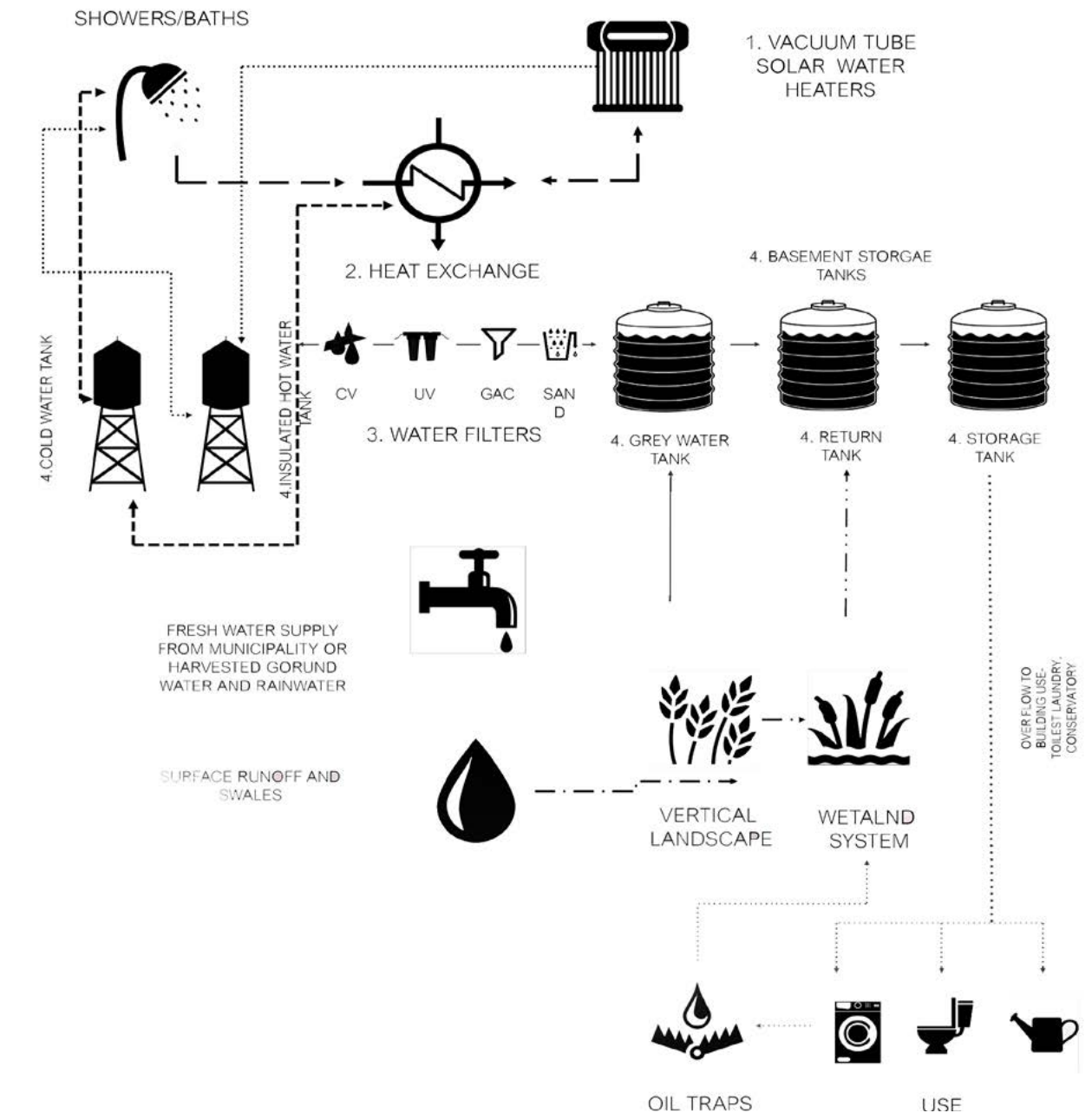
WETLANDS

The wetlands receive both storm water as well as grey water to maintain water levels throughout the year, although there is provision for seasonal fluctuations. In the final rain garden, there is also provision for a subterranean storm water tank to prevent any damage to the wetland that a flash flood could cause.

RAINWATER PURIFICATION

Rainwater is harvested from the oncology centres roof surfaces and directed to the basement storage tanks where it is purified before entering the building. The rainwater purification system includes a series of bio-filters such as sand, plant and gravel that are used to cleanse the water before it is directed through to a UV filter that further kills any unwanted pathogens. The water is now drinkable and ready for human use.

Fig 8.12: Summarised water system





150 LIGHT WEIGHT CONCRETE PLANTED ROOFTOP

30mm Polycarbonate wall is used to diffuse harsh western sunlight provide soft lighting and heliotherapy. Due to its thermal efficiency it is used to stabilise the room temperature while patients receive infusion. The translucency of the material acts as a veil of privacy.

OFFICE

PRIVATE INFUSION

INDIVIDUAL THERAPY ROOM

COMMUNAL GROUP ROOM

VIEWING DECK

CASCADING VIEWING DECK

SKY BRIDGE

MAIN CIRCULATION AXIS

BUILDING ENTRANCE

URBAN GARDEN RESTAURANT ROOF TOP

URBAN GARDEN WALKWAY

RETURNED GREY WATER STORAGE TANK

WASTE WATER MANAGEMENT

WATER RESEARCH

WATER PLANTS

HYDROTHERAPY BATH

HYDROTHERAPY BATH

HYDROTHERAPY BATH

REINFORCED CONCRETE TANK BASEMENT WALL NOTE

200 Reinforced concrete retaining wall with weep holes 500mm spacing with a 75mm cavity to 110 NFX brick wall

0.45 polyolefin dam proof membrane

Approved backfilling as per engineers specifications : Course rocks, finer rocks and sand

Sump with cast iron grating and submersible pump to ground water storage

The water then goes through a secondary UV and charcoal filtration system before it enters the building and is stored in the underground basement water tanks and distributed to basins, water closets and the hydrotherapy chambers.

GABON WALL AERATION CASCADE UV TREATMENT AND CHARCOAL FILTRATION

500 Reinforced in-situ concrete retaining wall to engineers specifications, with concrete screed fixed to fall with Durapond Polyurethane Pond Sealer

7

6

5

4

3

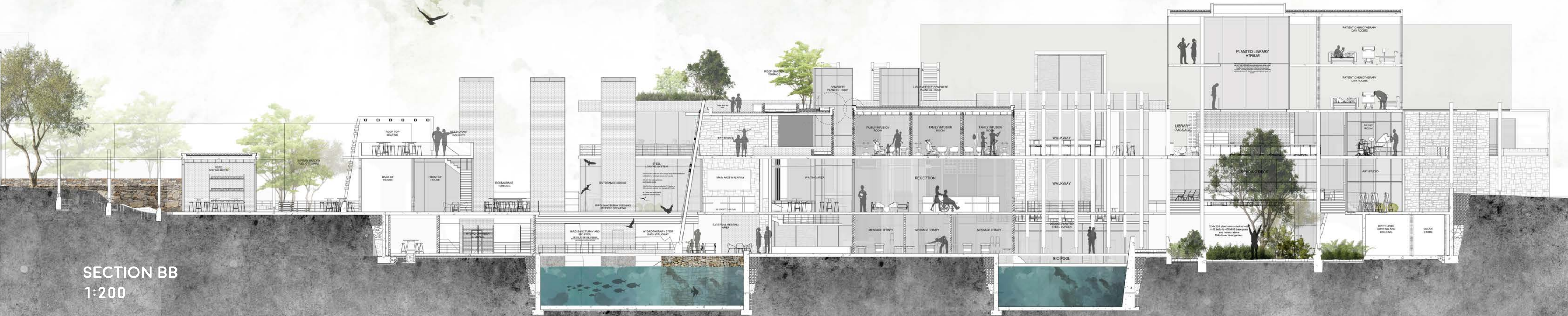
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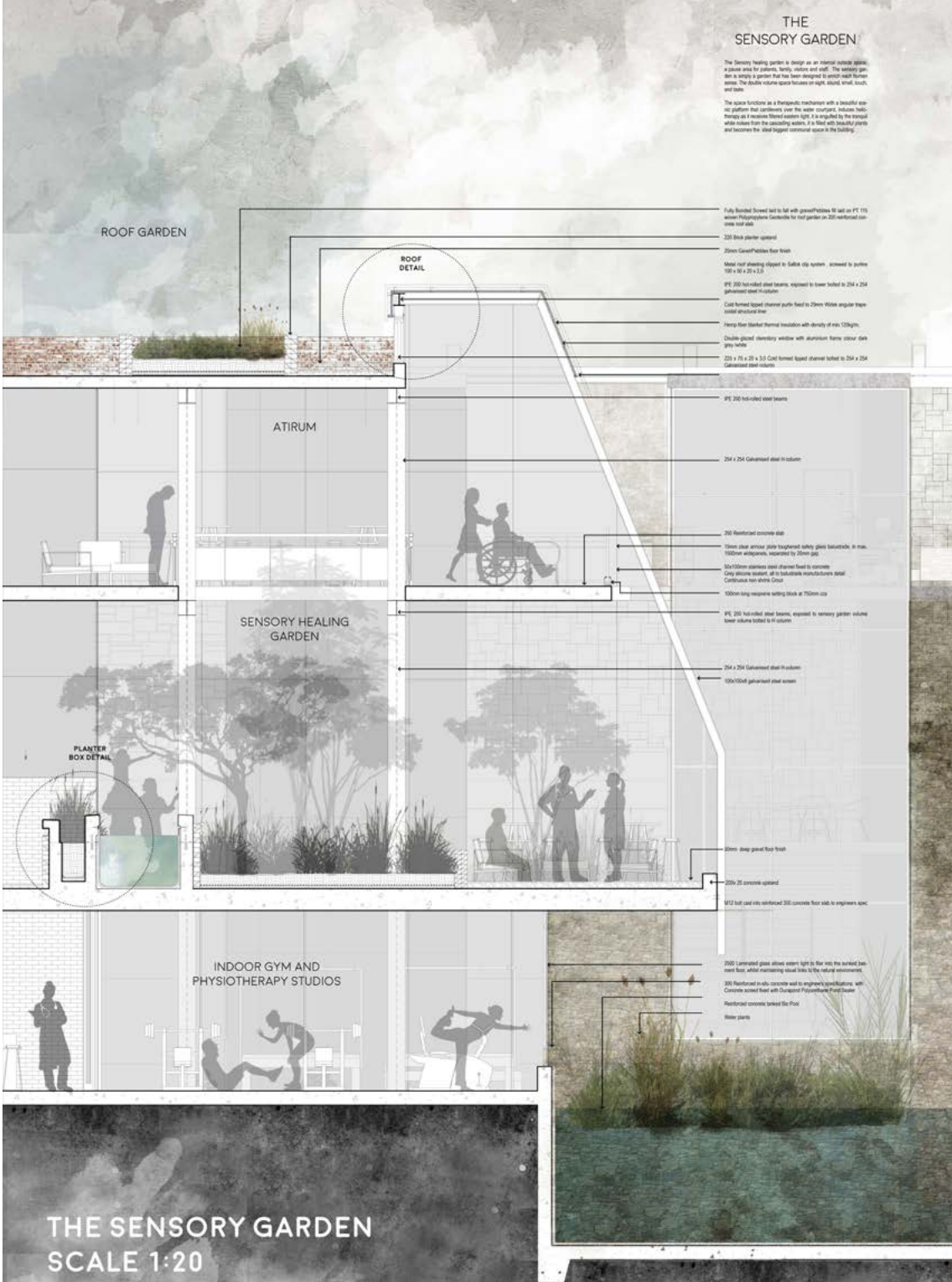
1

LE GEURISSEUR
AN URBAN ONCOLOGY WELLNESS
TREATMENT CENTRE

THE URBAN
GARDEN

SECTION BB
1:200

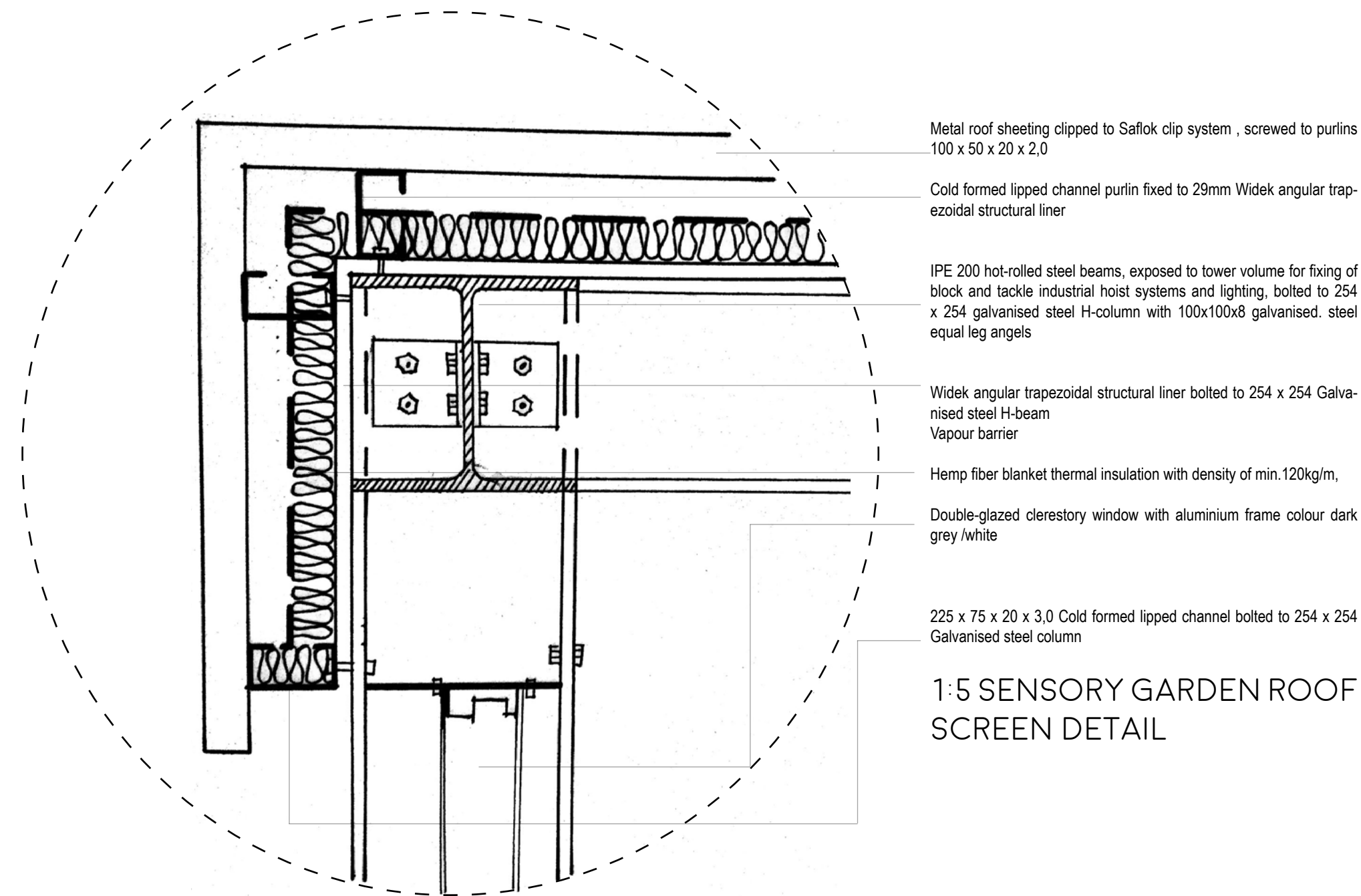


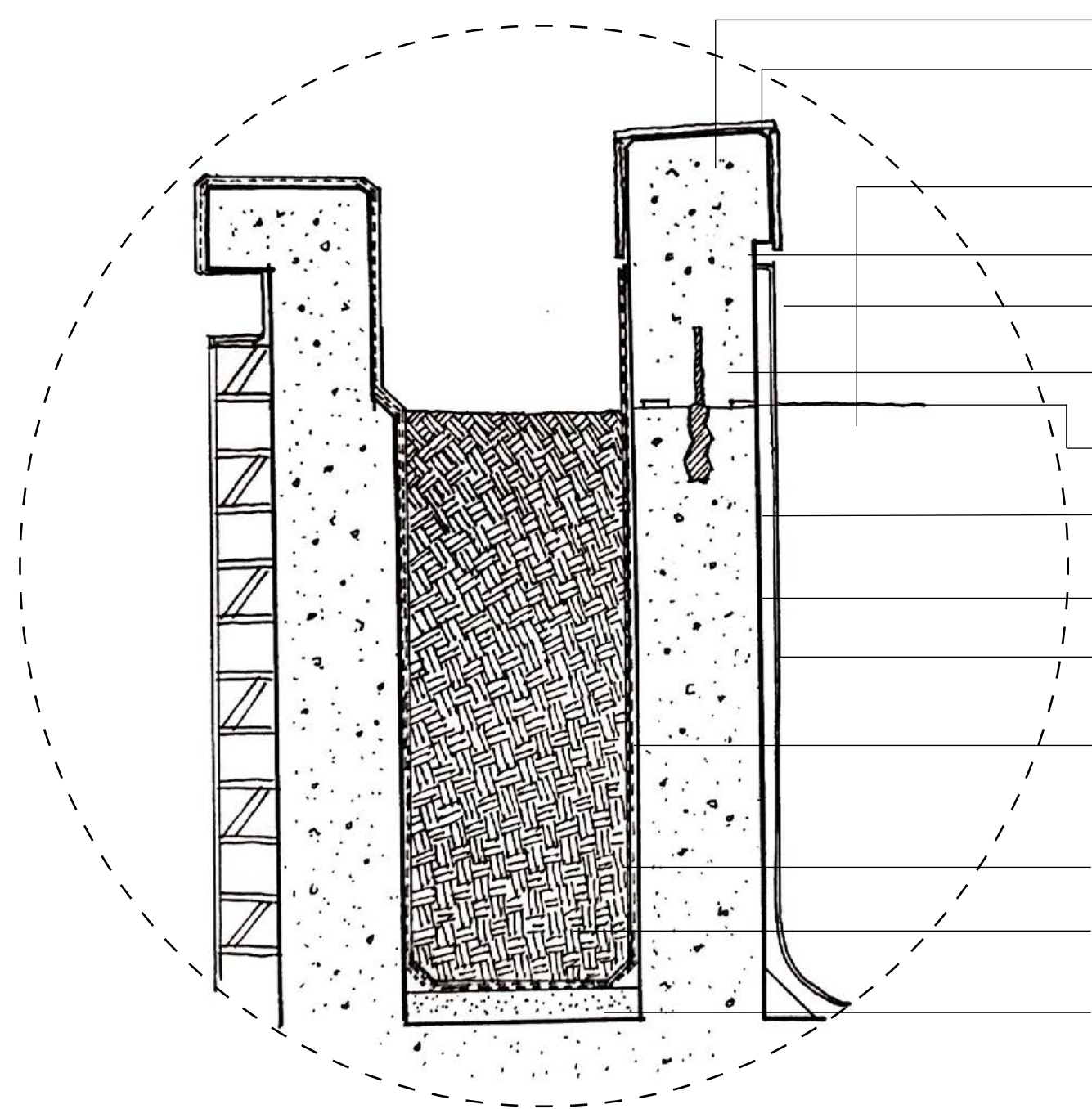


THE SENSORY GARDEN

The Sensory healing garden is design as an internal outside space, a pause area for patients, family, visitors and staff. The sensory garden is simply a garden that has been designed to enrich each human sense. The double volume space focuses on sight, sound, smell, touch, and taste.

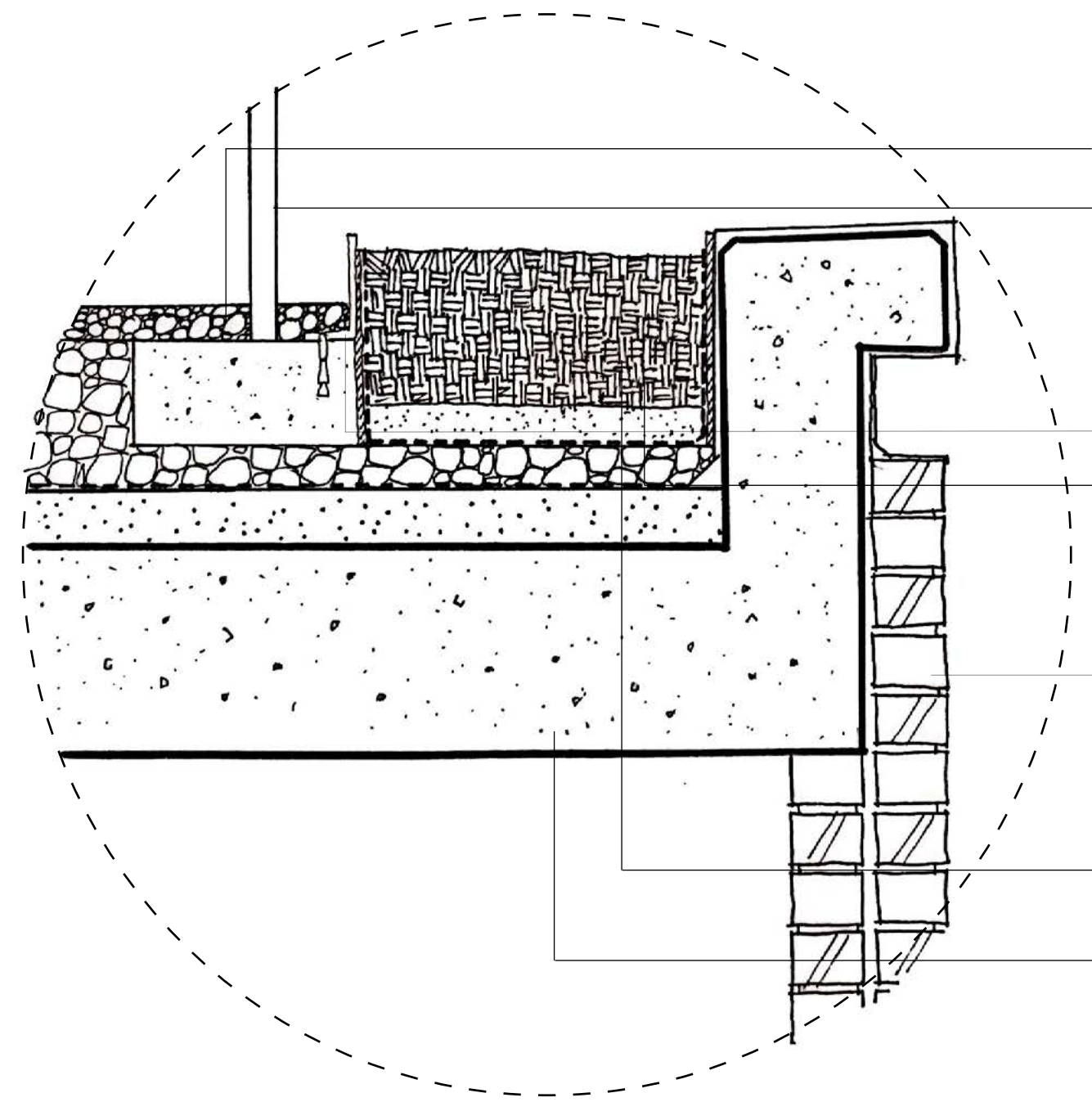
The space functions as a therapeutic mechanism with a beautiful scenic platform that cantilevers over the water courtyard, induces heliotherapy as it receives filtered eastern light, it is engulfed by the tranquil white noises from the cascading waters, it is filled with beautiful plants and becomes the ideal biggest communal space in the building.





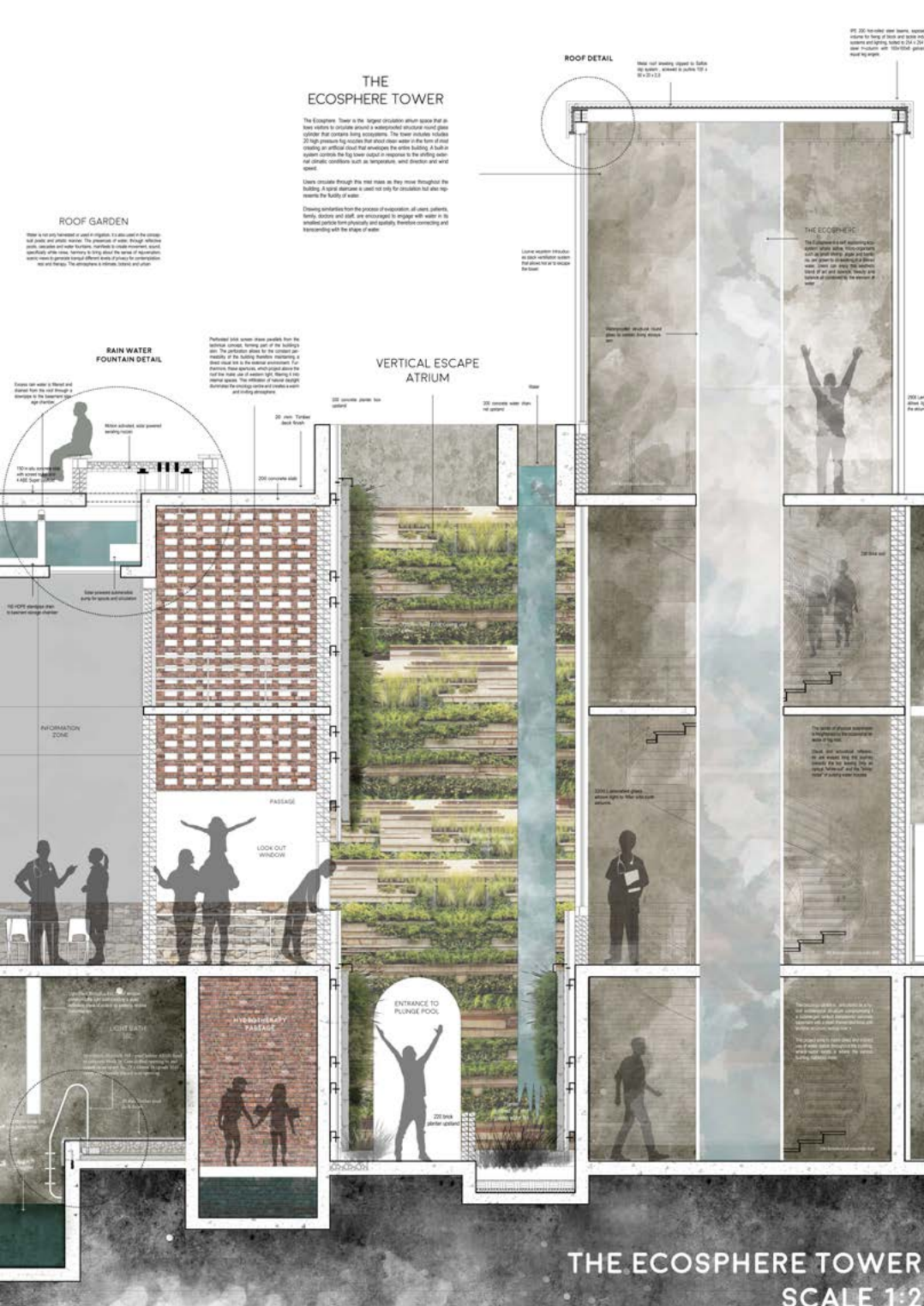
- RC Concrete upstand to Engineer's Specification. Drip detail to be applied into plasterwork. RC Upstand to receive 25mm chamfers
- a.b.e Duraflex (or similar approved), cementitious coating, reinforced a.b.e Ecofelt, applied in accordance with the manufacturer's recommendations. To be laid directly onto RC Upstand. Surface must be flush and free of indentations and recesses to overlap onto torch on waterproofing
- POOL
- New Brushed Stainless Steel (Grade 304 TBC) Shadow line (50mm x 40mm) to fixed with lugs Epoxy fixed into
- New Mosaic tiling to be installed by pool contractor – as per layout- Spec. Tile/Marblite junction/control joint. TBC with Pool Sub-Contractor
- Reinforced concrete upstand dowelled into concrete deck. A Penetron mix is to be used as per Eng. detail and spec.
- Penebar SW-55 to be installed at either edge of the RC Upstand - installed all in accordance with manufacturer's spec. and detail
- 150mm wide galvanised steel plaster mesh (Mentex Strip Mesh 210, or similar approved) fixed into RC Wall/Upstand to cover joint lines evenly-spaced, to manufacturer's specifications. Gunitite finish applied over
- 30mm (Min) Gunitite application onto RC pool structure trowelled to a smooth and level finish by Pool Contractor
- RC Wall with white MARBLITE finish - by specialist. Sample to be provided on site for Architect approval
- 1 layer a.b.e Unigum P 4mm membrane with 75mm side laps and 100mm end laps laid staggered on 1 layer a.b.e Unigum 3mm membrane with 75mm side laps and 100mm end laps, fully sealed together by torch on fusion to primed surfaces, followed by a 250 Micron Green DPC separation layer with 100mm side and end laps on top of the waterproofing, to receive a layer of no fines conc.
- Bidum A4 Geofabric: Min. 1.8 mm thick, nonwoven continuous filament, needle punched polyester geotextile
- Min. 50mm clean River Sand layer
- 30mm (Min) Fully Bonded Screed to Engineer's Detail & Sepec. Laid to 1:100 (min) fall - towards full flow outlets on top of RC slab to fall. To ENG. Detail

1:5 PLANTER DETAIL



- Minimum 60mm thick no-fines concrete as per Eng spec. and landscape arch. layout
- 50mm thick layer of tan gravel as per landscape architect detail
- 15mm clear amour plate toughened safety glass balustrade, in max. 1500mm wide panels, separated by 20mm gap
- 1-layer a.b.e. unigum p 4mm membrane with 100mm side laps and 150mm end laps, laid staggered on 1 layer a.b.e. unigum 3mm membrane with 100mm side laps and 150mm end laps. both layers fully bonded together by torch-on fusion to primed surfaces.
- 150 x 75 x 10mm glavanised unequal angle bolted to concrete planter wall to Eng. spec and detail
- Low shrub planting to grow over parapet
- 50x100mm mild steel channel fixed to concrete, all to balustrade manufacturers detail. Waterproofing to be lapped over steel angle by main contractor
- 220 brick wall: Masonry plaster finish: 1:2 sand: cement 'bag wash' applied onto wetted masonry walls with a wetted white-wash brush.
- Fully bonded screed laid to fall
Gravel/pebbles fill laid on PTT 115 woven polypropylene geotextile
25mm thick IsoBoard thermal insulation
- 150 Light weight reinforced concrete slab
minimum 60mm thick no-fines

1:5 PLANTER BALUSTRADE

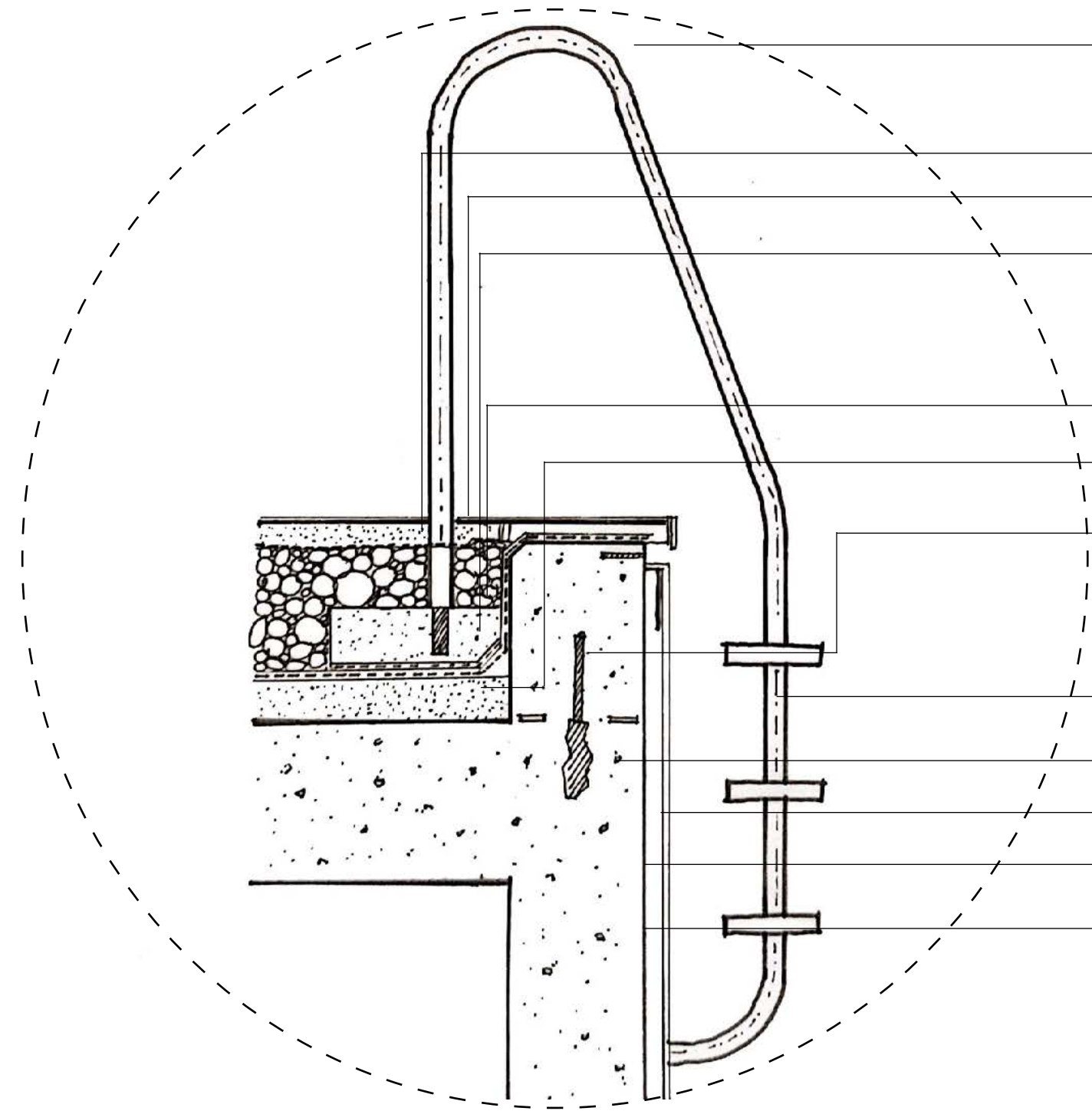


THE ECOSPHERE TOWER

The Ecosphere Tower is the largest circulation atrium space that allows visitors to circulate around a waterproofed structural round glass cylinder that contains living ecosystems. The tower includes 20 high pressure fog nozzles that shoot clean water in the form of mist creating an artificial cloud that envelops the entire building. A built-in system controls the fog tower output in response to the shifting external climatic conditions such as temperature, wind direction and wind speed.

Users circulate through this mist mass as they move throughout the building. A spiral staircase is used not only for circulation but also represents the fluidity of water.

Drawing similarities from the process of evaporation, all users, patients, family, doctors and staff, are encouraged to engage with water in its smallest particle form physically and spatially, therefore connecting and transcending with the shape of water.



50 x38mm SS Grade 316 - pool ladder ARMS fixed to concrete block by Core drilled opening to and seated in an epoxy fix. 75 x 63mm SS (grade 316) cover plate loosely placed over opening

50 x 50 x 3mm Galvanised Steel Angle - to landscape architect's spec. 10mm isolation joint to all vertical junctions around handrail post below FFL level

20 mm Timber pool deck finish

Concrete Block size as determined by Eng. & Sub- Contractor - Handrail to Comply with SANS regulations Concrete to be protected during construction that fine material does not block No-Fines. Top to be level.

Blocked to be wrapped in 250 Micron Green DPM separation layer with 100mm side & end laps.

60mm(Min) No -Fines Concrete To Engineer's Specification and layout

Fully Bonded Screed laid to falls towards Pluvia Outlets - To Eng. spec. & detail

200 Reinforced concrete upstand dowelled into concrete deck. A Penetron mix is to be used.

50 x38mm Grade 316 - pool ladder ARMS. Folded to shape SS (Grade 316) steps fixed to pool ladder arms. Shop welded, Continuous weld to occur underneath step as indicated).All Corners to be rounded Step to be perforated or treated to ensure R12 anti-slip rating.

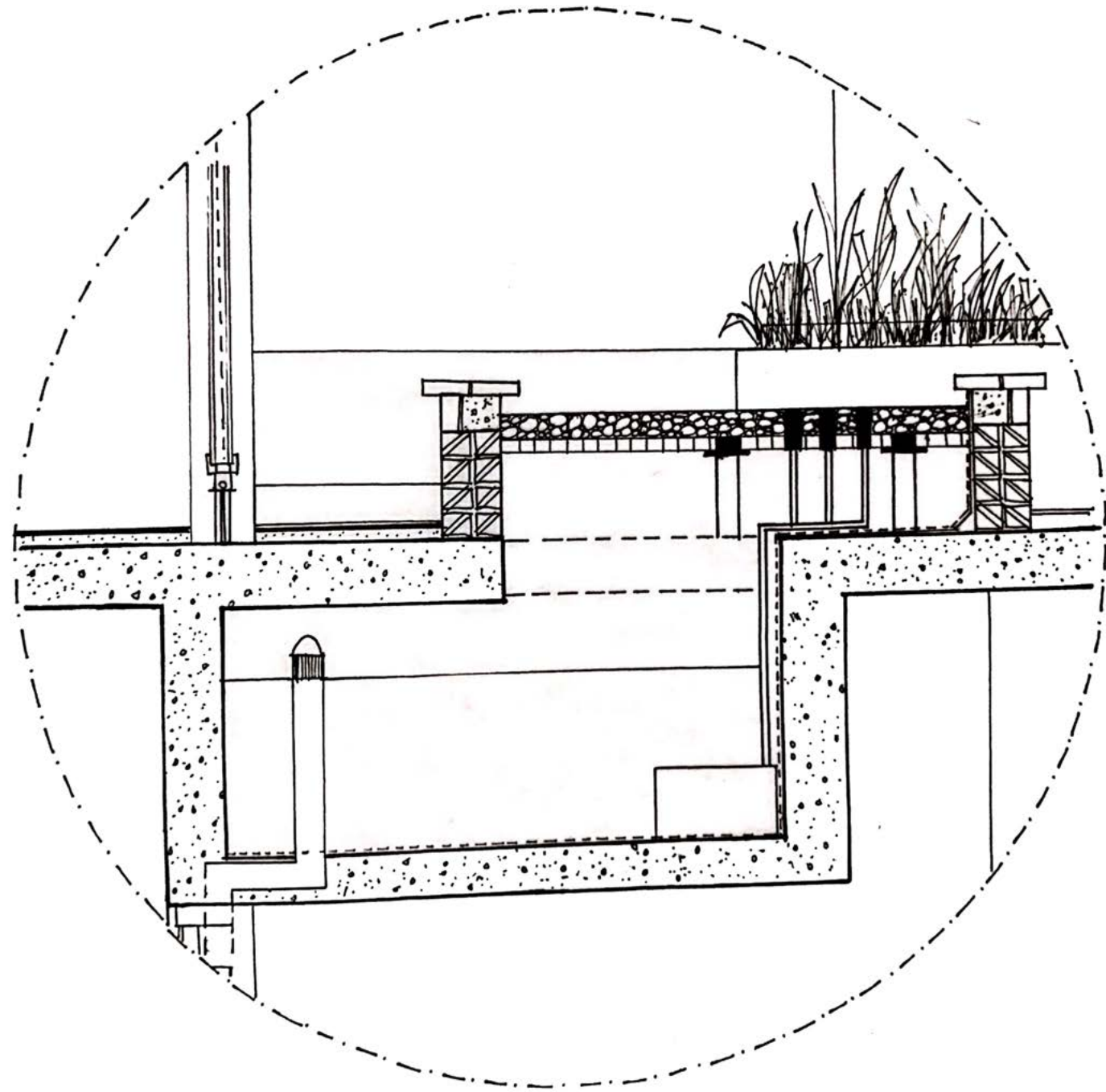
250 Reinforced concrete slab to engineer's specifications.

15mm White MARBLITE finish

30mm (Min) Gunitte application onto RC pool structure troweled to a smooth and level finish by Pool Contractor

200 Reinforced concrete

1:5 POOL LADDER SECTION



Motion activated, solar powered aerating nozzle

50x3 GMS square tubing support frame with T-pieces For support of

501x3 GMS grate with 100 gravel on top 270x725x500 precast concrete coping

450mm FBS Corobrick seating wall with precast concrete On top

220 brick seating and water fountain wall With precast concrete coping and 4 coast of ABE super laykold

In-situ concrete beam

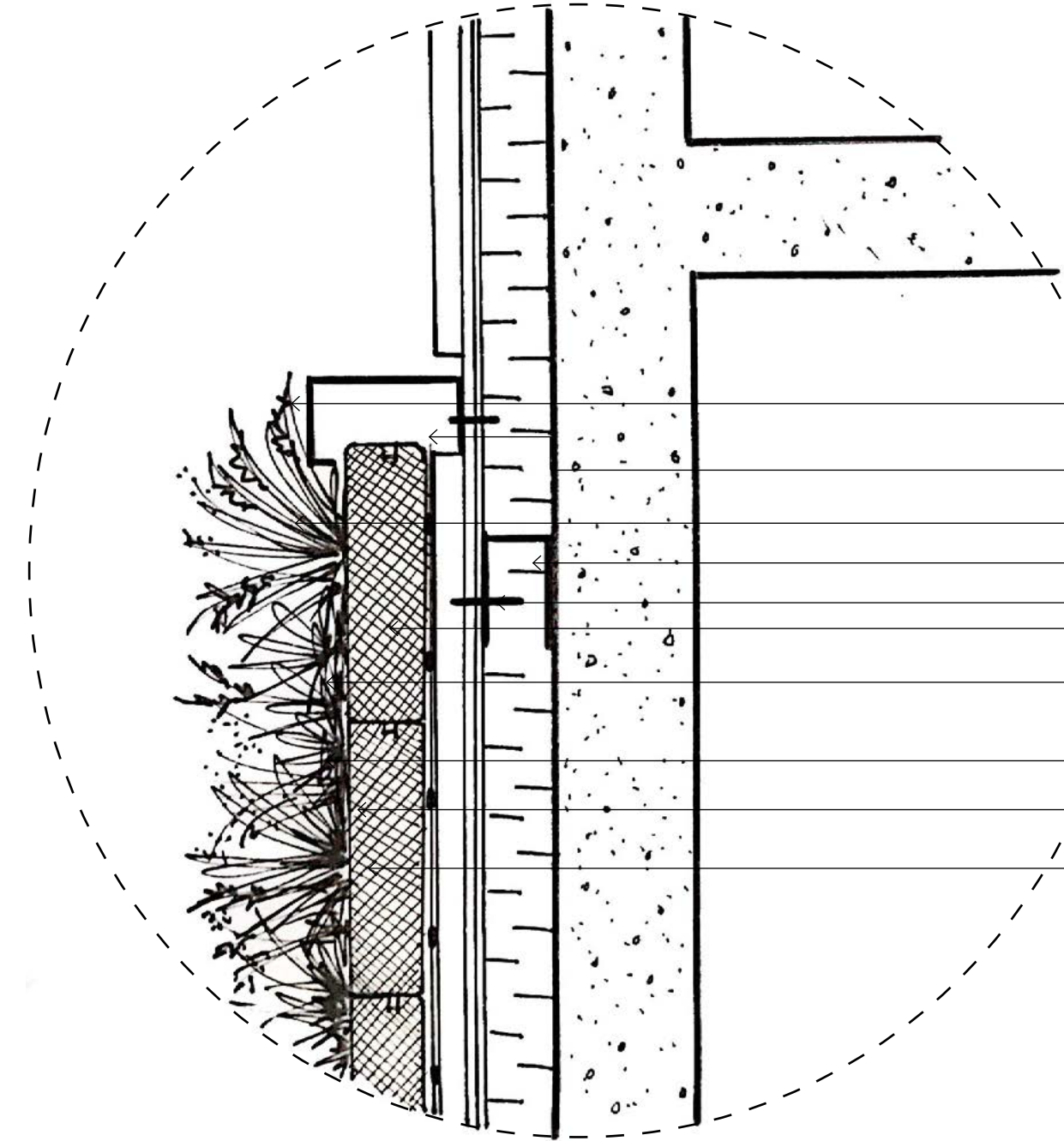
500x500x50 brushed precast concrete paver

200 in-situ concrete slab with screed fall and 4 coats of ABE laykold Waterproofing

150 HDE standpipe drain to underground storage chamber

Solar powered submersible pump for spout and circulation

1:5 WATER FEATURE DETAIL



Stainless GSKY top trim secured into trim mounting angle

M8 concrete anchor bolt : 15 x 100mm

Panel divide

Aluminium angle bead

10mm Plywood backing

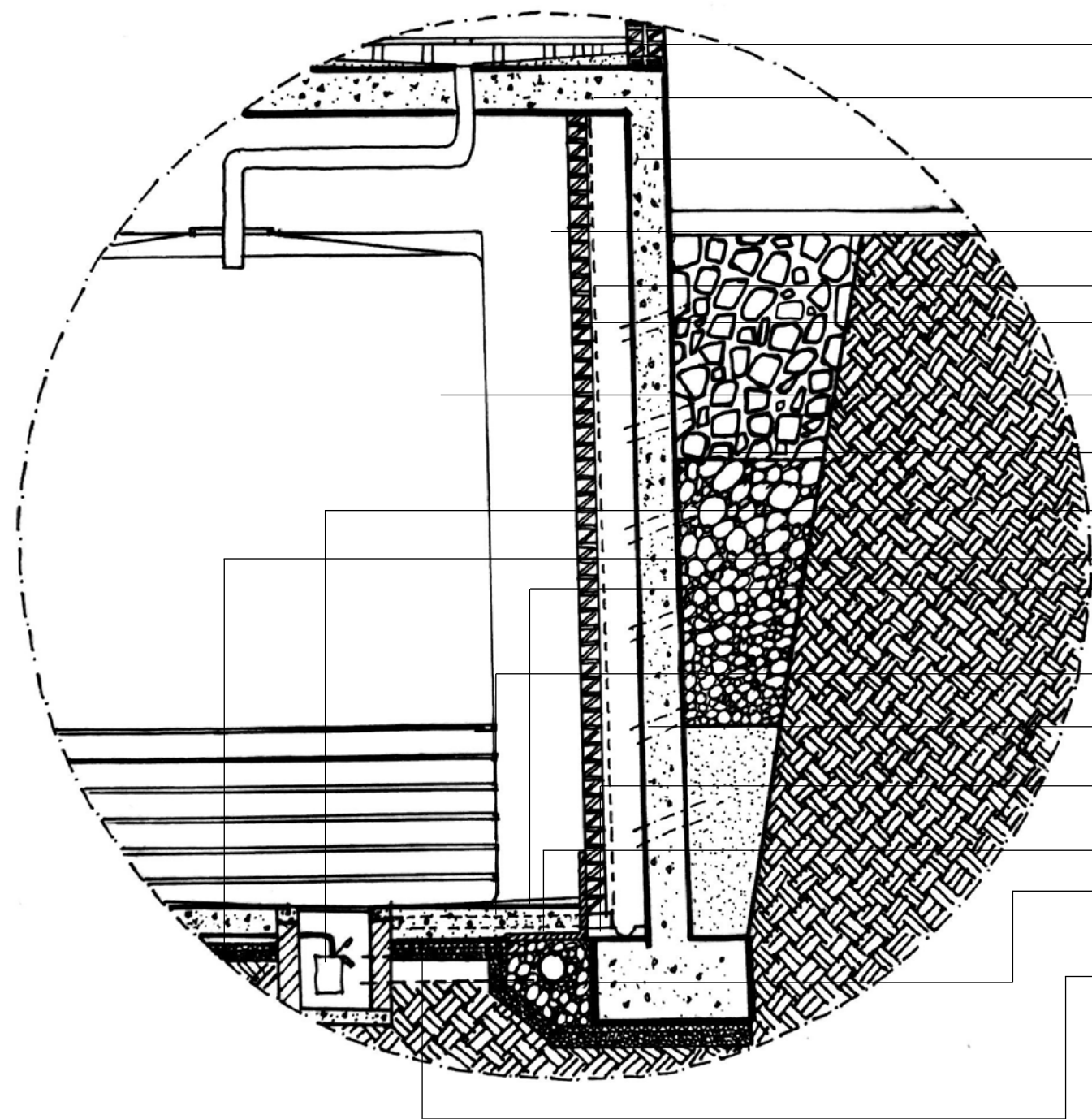
120mm deep GSKY living wall panel herbs 100 - 200mm precast concrete

GSKY irrigation drip line GSKY alumium frame

Waterproof membrane

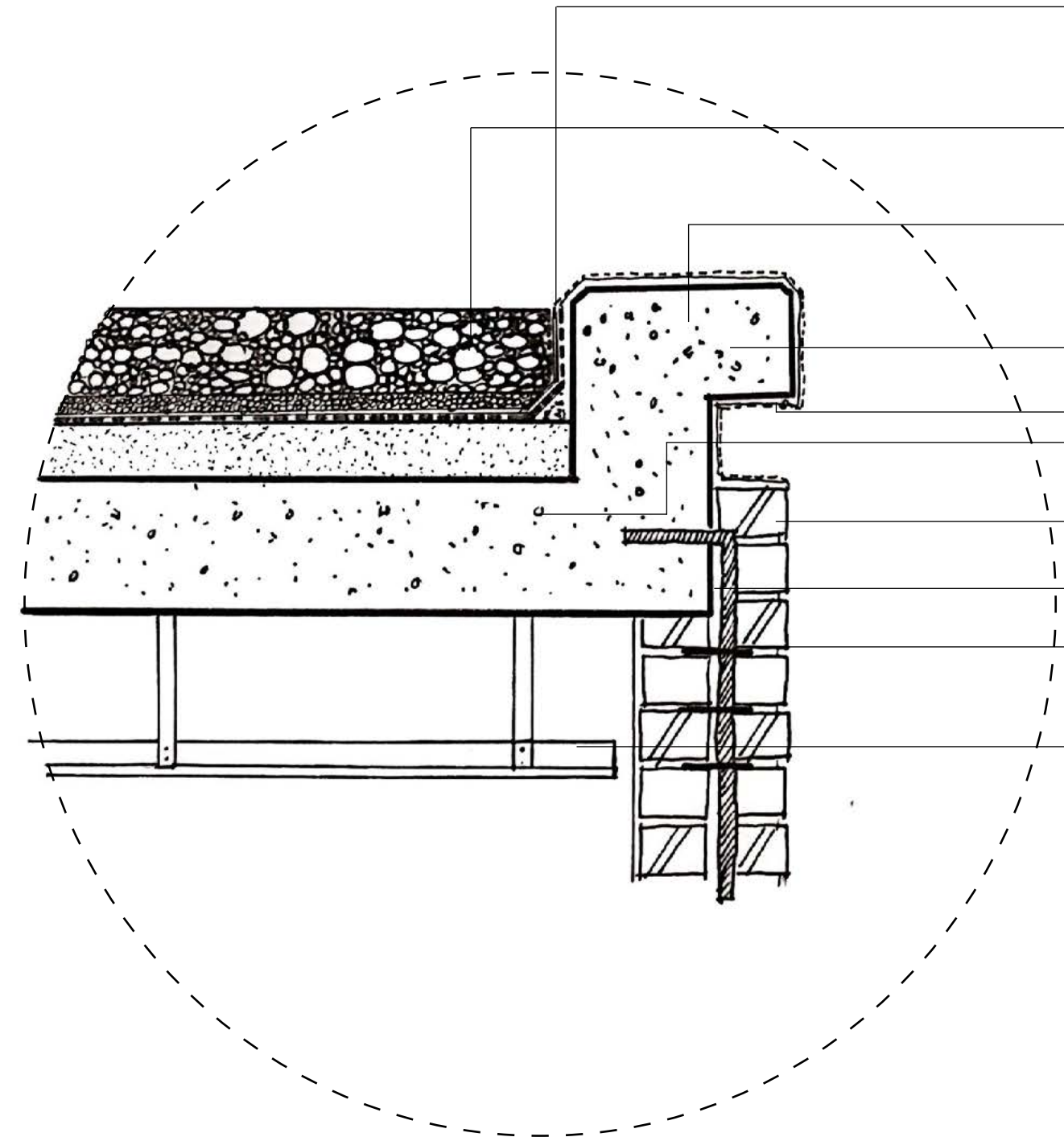
50mm rigid insulation

1:5 GREEN WALL SYSTEM



- Grey water drainage pipe to grey water storage Tank below
Concrete pavers NGL
- 200 concrete slab over IPE 200 cross beams
- 200 Reinforced concrete retaining wall with weep holes 500mm
spacing
- 100 NFX brick wall
- 75mm cavity
- 0.45 polyolefin dam proof membrane
- Grey water tank
- Approved backfilling as per engineers' specifications : Course
rocks, finer rocks and sand
- Sump with cast iron grating and submersible pump
- Pipe to ground water storage
- Mira drain board used to guide water from weep hole to drainage
pipe
- Taped seal between wall and floor membranes
- Weep hole to allow for water to flow to drainage channel
- Drainage channel to excavate water to drainage pipe
- Studded drainage channel to allow water flow to drainage chan-
nel
- Interior drainage pipe runs along footer and connects with sump
pump
- 200 no-fines concrete slab with 15mm screed fall

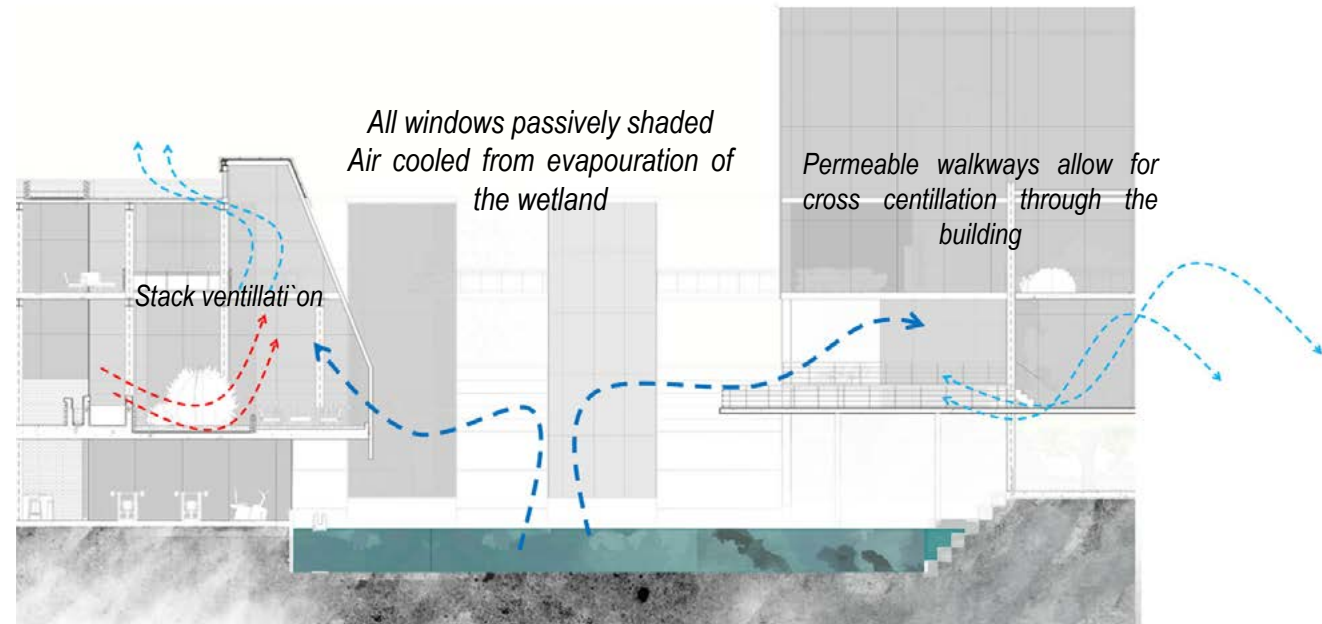
BASEMENT DETAIL



- 1 layer a.b.e. Unigum P 4mm membrane with 100mm side laps and 150mm end
laps, laid staggered on 1 layer a.b.e. Unigum 3mm membrane with 100mm side laps
and 150mm end laps. Both layers fully bonded together by torch-on fusion to primed
surfaces.
- Fully Bonded Screed laid to fall
Gravel/Pebbles fill laid on PT 115 woven Polypropylene Geotextile
25mm thick IsoBoard Thermal Insulation
- a.b.e Duraflex (or similar approved), cementitious coating, reinforced a.b.e Ecofelt,
applied in accordance with the manufacturer's recommendations. To be laid directly
onto 330 Reinforced Concrete upstand to Engineer's specification @ 2' slope . Sur-
face must be flush and free of indentations and recesses to overlap onto torch on
waterproofing
- a.b.e Duraflex (or similar approved), cementitious coating, reinforced a.b.e Ecofelt,
applied in accordance with the manufacturer's recommendations. To be
laid directly onto brickwork.
- Drip detail to applied into plasterwork and Galvanised hoop iron strap
- 150 Lightweight reinforced concrete dropped slab on 220 Brickwork wall Brickwork
Perp's pointing is to be flush with brickwork wall
- Masonry plaster finish: 1:2 sand: cement 'bag wash' applied onto wetted masonry
walls with a wetted white-wash brush.
- M16 Threaded Bar, Epoxied into slab and welded to Steel plate, @ centers as
indicated by Eng. As per Engineer Detail
- Wall ties as per Structural Engineer's Specification
- Gypsum flush plastered ceiling 9.5mm thick with tapered edge, screwed to screw
up ceiling with drywall screws spaced at 150mm centers, with main tees at 1200mm
centres and cross tees at 400mm centres. All suspended with 25 x 25mm galvanised
angles. Joints to be covered with tape fixed over joints then plastered with 6mm thick
skim plaster and skim applied as per manufacturer's instructions.

1:5 ROOF PLANTER DETAIL

INTERNAL BUILDING SKIN

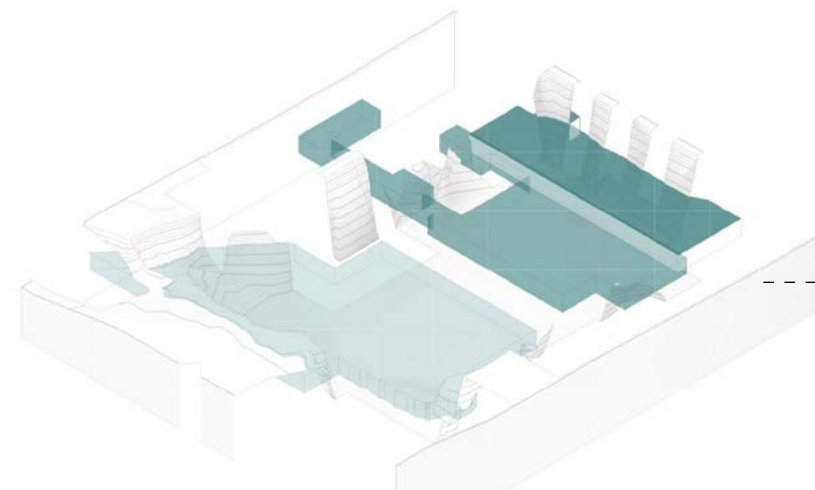
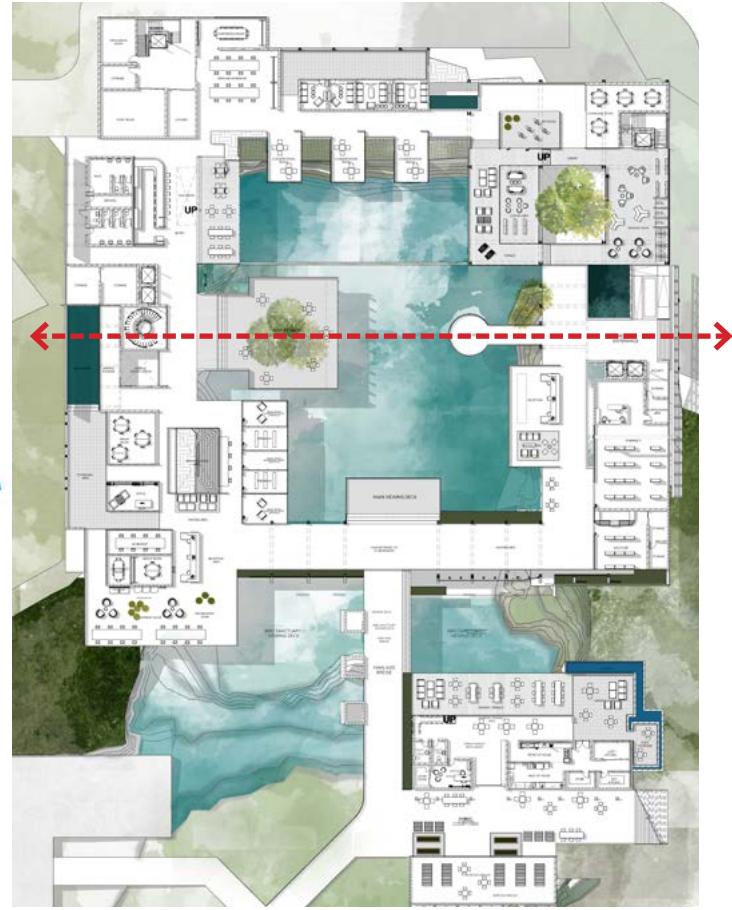


VENTILATION

Due to the building been designed around a central water courtyard, the building uses direct evaporative cooling as its primary ventilation system. The evaporation of the wetland helps to passively cool the building, by reducing the need for air conditioning. with the combination of other passive design techniques, efficient thermal comfort can be achieved.

Cooling is induced during the evaporation process in the internal water courtyard and does not elevate the indoor humidity levels at all. This ventilation system cools the air on the internal building envelope and brings the cool air in the oncology centre.

Stack ventilation is used in building interiors, underground hydro chambers and towers. Stack ventilation uses various air temperatures to move air. The building uses geothermal pipes to allow cool air to enter the building through low inlets, while outlets are put at the highest points in the building to allow for hot air to exit (Ismail, Malek and Rahman, 2012).



WATER

Water becomes the integral non-structural part of the building, as the oncology centre is designed around it. The water becomes the spatial boundary or building thread that not only combines the various activities and levels of therapy but also becomes the thread that connects all building materials, where water exists is where the various building materials meet or coexist, therefore enforcing the structural hybridity of the building and making the direct and indirect use of water visible through the structure. Water circulates through the oncology centre in a closed loop system, therefore the water waste is continuously cleaned and re-used by the various water-based activities in the building.

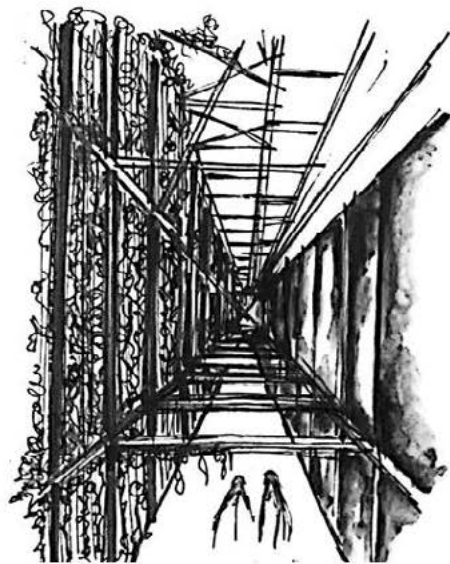
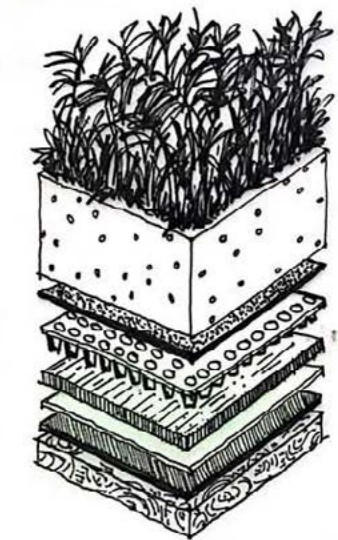
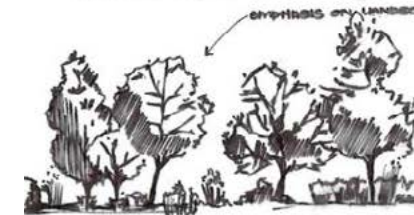
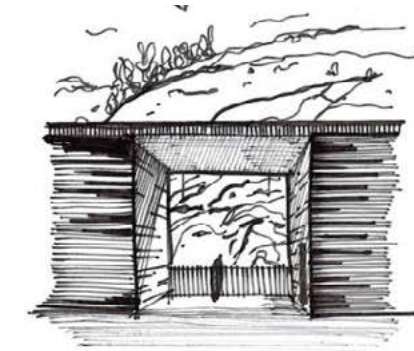
Water is not only harvested or used in irrigation, it s also used in the conceptual poetic and artistic manner. The presences of water, through reflective pools, cascades and water fountains, manifests to create movement, sound, specifically white noise, harmony to bring about the sense of rejuvenation, scenic views to generate tranquil different levels of privacy for contemplation, rest and therapy. The atmosphere is intimate, botanic and urban.

HEALING PLANTS

The relationship between herbs and bath are inseparable. With addition of herbs, a bath of hot water can become something special. It will give olfatorial identification, and healing property such as reduction of stress level, and providing a relaxing experience to everyone.

Herbs used in bath will be harvested from herb gardens on the roof and ground floor. Then they will be dried in the drying room or through the furnace.

-  **Lavender**
Baths filled with lavender herbs are used in restoration of energy, as a sedative, as well as a tool to reduce blood pressure.
-  **Chamomile**
Chamomile is used for rheumatism, gout, neurosis, spastic bowel conditions, weeping eczema, septic sores, diseases of female genital sphere, hemorrhoids.
-  **Eucalyptus**
Eucalyptus has a distinctly clean, fresh flavor of menthol, which is refreshing and flavorful at the same time. It is good for chronic and back pain and tired muscles.
-  **Rosemary**
Rosemary excites and stimulates the nervous system. It is used to relieve headaches, migraines and muscle pain.
-  **Fennel**
Fennel bath helps to fix a bloated stomach, excess wind, colic, constipation and other digestive problems.



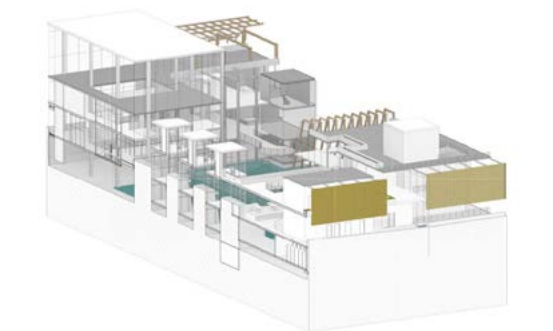
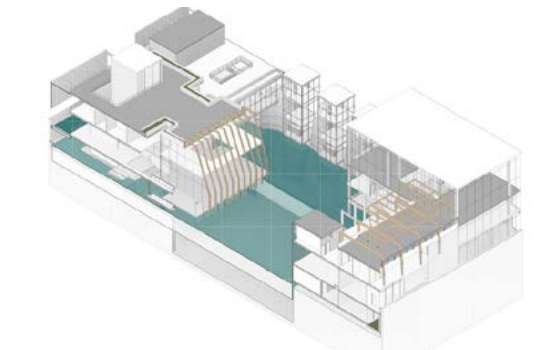
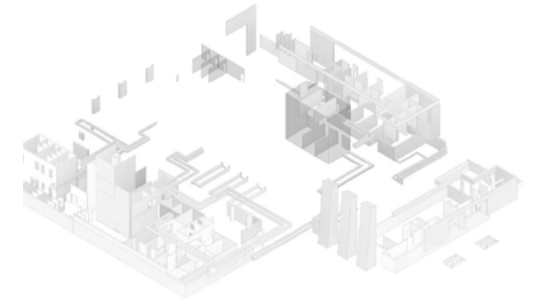
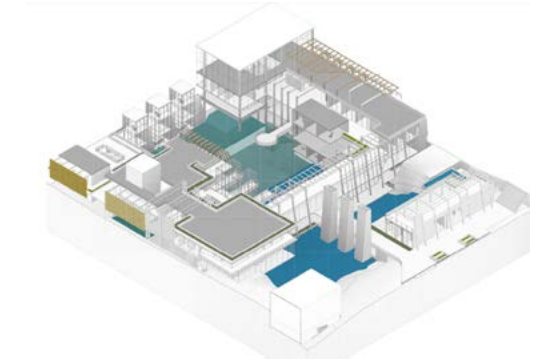


BUILDING SKIN

The building skin is comprised of 6 non-structural materials that make connections with the landscape and wrap around the building to manipulate the poetics of light, the quality of façade ventilation and for the growth of various plants from the urban garden to creep and grow onto the building.

The skin becomes a new architectural layer by allowing nature to not only take control but also form part of the building makeup therefore emphasising the intention of biophilic design:

1. Acid-mashed steel screens with 50x50mm steel angle slats, which are pre-drilled to encourage trained creeper growth over the building façade.
2. Laminated glass panels with a SolarShield S20 serene-green UV protected finish for constant visual links to the internal water courtyard and surrounding natural environment
3. 50x50mm steel that allow creeper growth over the building façade
4. 50x50mm timber pergola that also allows for the growth of plants over the building façade
5. 1000x2500x3 SA 588 Grade A acid-mashed metal roof sheet, screwed with flush joints to 12mm plywood sub-layer and fixed with flush joints to 125x65x20x2 steel lipped channel paths.
6. Perforated brick screen draws parallels from the technical concept, forming part of the building's skin. The perforation allows for the constant permeability of the building therefore maintaining a direct visual link to the external environment. Furthermore, these apertures, which project above the roof line make use of western light, filtering it into internal spaces. This infiltration of natural daylight illuminates the oncology centre and creates a warm and inviting atmosphere
7. Lastly, the building comprises of various external walkways, courtyards and open-air communal spaces, therefore allowing the natural environment to penetrate the building skin and move freely throughout the architecture.





STONE

BRICK

TIMBER

STEEL

WATER

GABION

BRICK

View 10
External staff service passage



View 11
Aerial view

USE OF BRICK:

Due to the previous abrupt halted construction that occurred on site, various materials were left over such as concrete rubble, exposed piping and a large amount of clay brick. The new materiality of the building intends to preserve and reuse the left-over brick as a recycled material to celebrate and form a poetic dialogue with the history of the site and to create a narrative between the architecture and landscape, emphasising their interdependence. The use of brick was also chosen for its durability, stereotomic and tectonic flexibility, for its ability to weather and lastly for its transformation when exposed to water.

USE OF TIMBER

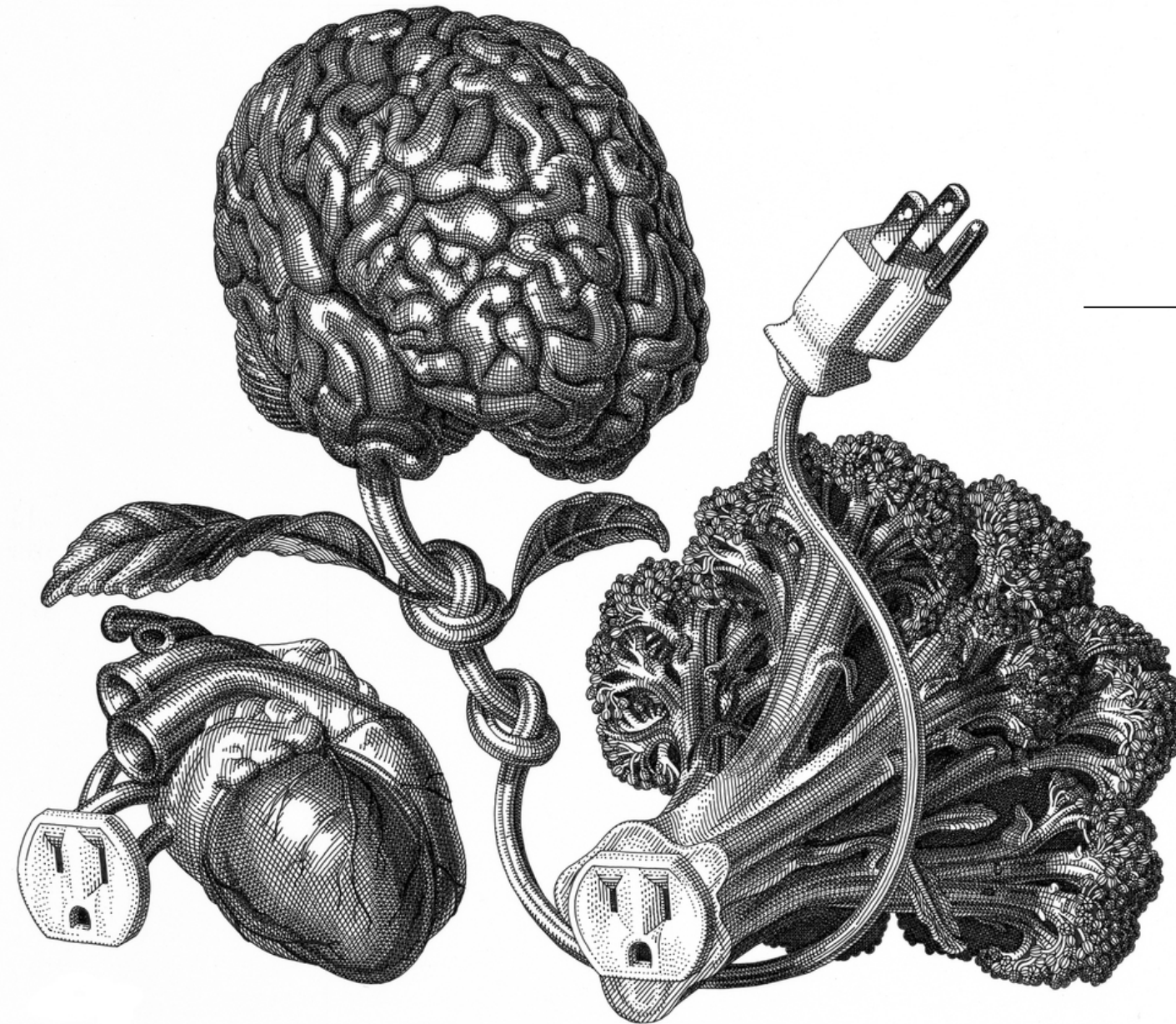
The use of timber is part of a bigger design intention to reverse the norms of hospital architecture, where clinical institutionalized environments can make patients feel isolated and uncomfortable. One of the side effects of chemotherapy is sensitive skin, specifically to the hands and feet therefore timber is used in both internal and external finishes to bring in a sense of warmth, softness and patient comfort.



View 12
View from Urban Garden
Restaurant rooftop

09

Fig 9.1 "Input" (Knapp, 2013)



09.

CONCLUSION

CONCLUSION

The dissertation intention aimed to investigate and highlight the issue of the existing medical facilities and their disconnect to the natural environment which has led to a focus on functionality and rationality of form rather than a fluidity of design that focuses on overall good health, comfort and security, therefore, creating inhumane “healing” environments that have greatly affected patient recovery time and overall well-being within the urban environment.

The idea that a building can induce healing derives from the idea of Therapeutic Architecture, an umbrella concept that introduced theories such as Ecopsychology, Biophilic Design, Evidence-Based Design, Phenomenology and Regenerative design that all were used to explore the various ways in which water could be used as the holistic thread that would combined the chemical, physical, emotional, mental and natural spheres of healing to achieve a patient centred design of an oncology centre that focused on wellness and well-being.

Through the investigation it was evident that these theories and concepts do not suggest that architecture can heal, but rather through architec-

tural manipulation and transformation of space designers can create multiple platforms for natural elements such as light, sound, colour, views, and textures to induce a healing environment that would in turn positively affect the physical and psychological well-being of people.

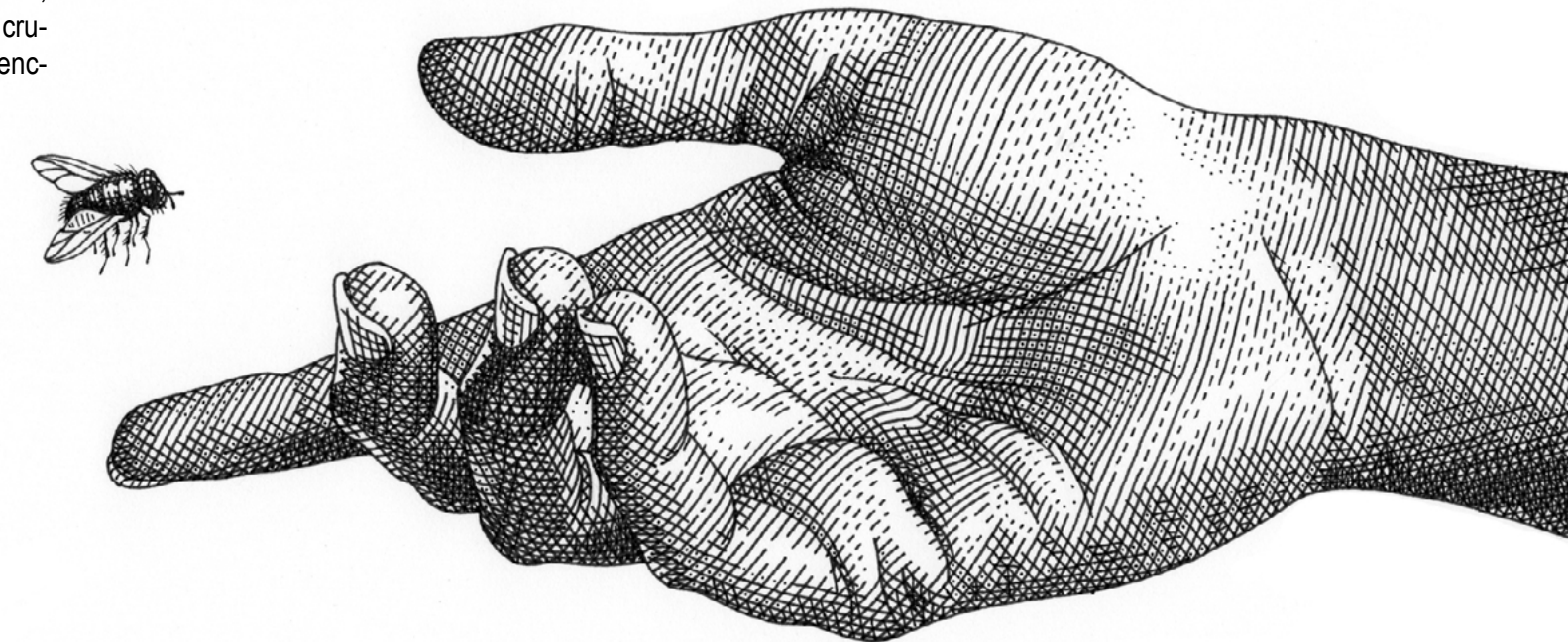
Water was used as a non-structural element in the building that was designed to run freely and become the most integral spatial element of the oncology centre.

Water was investigated to become the spatial boundary or building thread that not only combines the various activities and levels of therapy but also becomes the thread that connects all building materials, where water exists is where the various building materials meet or coexist, therefore enforcing the structural hybridity of the building and making the direct and indirect use of water visible through the structure.

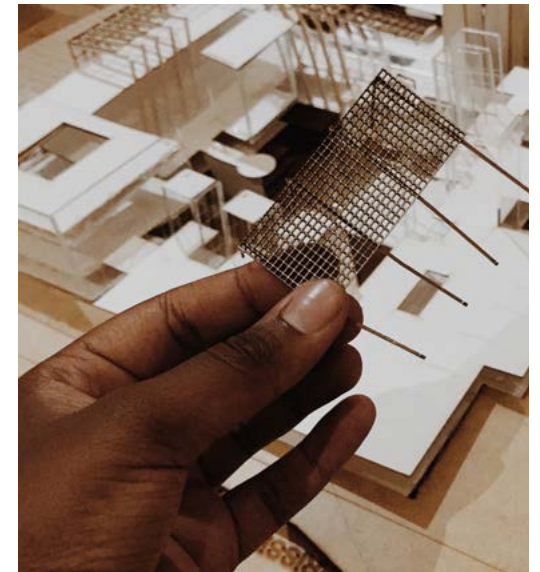
Water was designed to allow users to always hear, feel, smell, and be in the presences of water, therefore creating a sense of place for the patients and a new identity for the oncology centre.

Furthermore, working with a discarded and derelict site, that is 75 Meintjies Trevenna, Pretoria, allowed for the opportunity to design an architectural typology that would merge with the landscape and act as a catalyst for the ecological regeneration of an urban void and promote a novel life style which transforms the traditional architectural expression, “building in a landscape” to “building as landscape”; therefore inducing the remediation of a once scarred landscape.

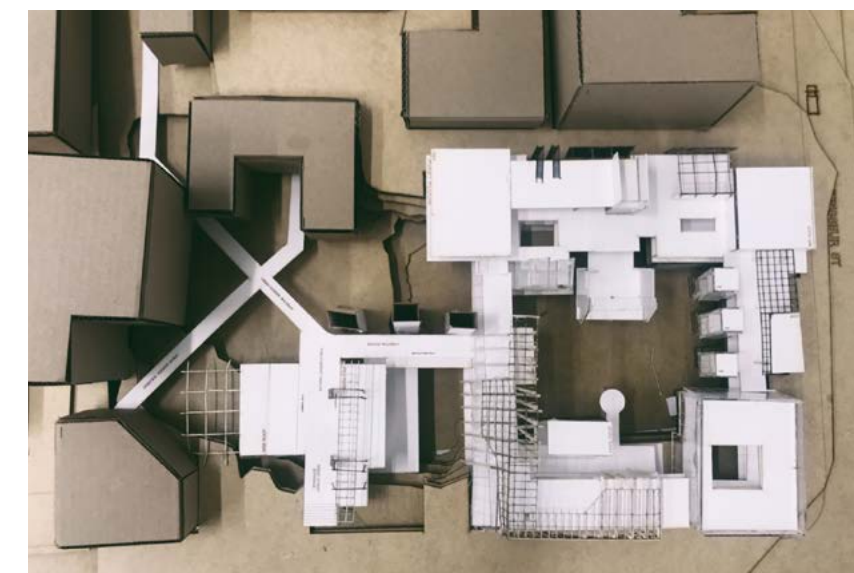
In conclusion, it is evident that therapeutic architecture can be used as appropriate strategy for the design implementation for various South African healthcare typologies, as its various ideas, methods and approach to healing becomes crucial, necessary and evidently positively influences the healing capacity of patients.



model MAKING



final
MODEL OF LE GUERISSEUR



final PRESENTATION



final MASTERS EXHIBITION: COROBRIK "BEST USE OF CLAY MASONRY" 2019 WINNER



10

Fig 10.1 "Puddle" (Knapp, 2013)



10.
APPENDIX



Reference number: EBIT/E11/2019

25 April 2019

Prof A Barker, Mr JN Prinsloo & Ms C Karusseit
Department Architecture
University of Pretoria
Pretoria
0028

Dear All

FACULTY COMMITTEE FOR RESEARCH ETHICS AND INTEGRITY

Your recent application to the EBIT Research Ethics Committee refers.

Approval is granted for the application with reference number that appears above.

1. This means that the research project entitled "*Masters professional dissertation in architecture, landscape architecture and interior architecture*" has been approved as submitted. It is important to note what approval implies. This is expanded on in the points that follow.
2. This approval does not imply that the researcher, student or lecturer is relieved of any accountability in terms of the Code of Ethics for Scholarly Activities of the University of Pretoria, or the Policy and Procedures for Responsible Research of the University of Pretoria. These documents are available on the website of the EBIT Research Ethics Committee.
3. If action is taken beyond the approved application, approval is withdrawn automatically.
4. According to the regulations, any relevant problem arising from the study or research methodology as well as any amendments or changes, must be brought to the attention of the EBIT Research Ethics Office.
5. The Committee must be notified on completion of the project.

The Committee wishes you every success with the research project.

Prof JJ Hanekom

Chair: Faculty Committee for Research Ethics and Integrity
FACULTY OF ENGINEERING, BUILT ENVIRONMENT AND INFORMATION TECHNOLOGY

ETHICS APPROVAL



Carmen Lupiolo Songabau

Le Guérisseur "The Healer"

Investigating Therapeutic Architecture as a Catalyst for the Remediation of the Reciprocal Relationship between Man and Nature through an Urban Hydrotherapy Cancer Treatment Centre.



Fig 1: Graphic Exploration illustrating the idea of Therapeutic Architecture (Author, 2019)

INTRODUCTION

The ideal relationship and interconnection between architecture and landscape, man and nature, was once a unified living system (Rios, 2013: 200). The prehistoric architectural connotation to this was "building in a landscape" (Gardioli, 2016); romanticising the relationship between the two. However, due to the minimalistic paradigm of the 20th century, man's ideals had shifted, and the relationship was abandoned as the idea of the human necessities had changed and that modern man and his built environment were more important and more powerful than the natural environment (Rios, 2013: 201). This architectural expression is known as "building on landscape". (Gardioli, 2016)

During the minimalistic paradigm of the 20th century, in the quest to attain modern civilisation, the ideal reciprocal relationship between architecture and landscape, man and nature, was abandoned as human needs and desires dictated that modern man and his built environment were more important and more powerful than nature. Unknowingly, man had compromised his very own existence and nature, his primary source of healing, had been affected too and started contributing in creating ailment for its inhabitants. In the search to find cures, an increase in technological advancements led to the rapid

evolution of medical science and an institutional architecture where state-of-the-art hospitals were designed to accommodate state of the art equipment, which led to a focus on functionality and rationality of form which has greatly affected patient recovery time and overall well-being which led to inhumane "healing" environments rather than a human centred approach the focuses on the human body being central to an experience that is medical, sensorial and spatial.

This essay aims to investigate and highlight the issue of existing medical facilities and their disconnect to the natural environment and how through the theory of Therapeutic Architecture, medical institutions can realign their role by acting as a mediator between man and nature, promoting mutual exchange and benefits for the betterment of patient's overall quality of life, sustainability, social equity, health and resilience. For this reason, a proposed Hydrotherapy Cancer Treatment Center would act as an experimental programme to set an example for the creation and interconnection between architecture and landscape in a medical institution as their amalgamation promotes the idea of 'SLOW LIFE HEALING SPACES', an idea that promotes a better quality of life not only for patients, but also for families and staff.

Furthermore, working with a discarded and decaying urban void, that is 75 Meintjies Trevenna, Pretoria, allows for the opportunity to design an architectural typology that would merge with the landscape and promote a novel life style which transforms the traditional architectural expression, "building in a landscape" to "building as landscape"; by encapsulating the therapeutic qualities of nature in order to create a healing environment that would not only encourage human interaction, rest and reflection to enhance their road to recovery and increase their sense of well-being, but also simultaneously becoming a catalyst for regenerative design, as the return of man back to nature would induce

the remediation of a once scared landscape.

Therefore, the site also extends itself to the theory of Therapeutic Architecture as the introduction of a Hydrotherapy Cancer Treatment Center within the urban void becomes a catalyst for the exploration and repair of the poor ecological void, Trevenna, in the capital city. The site therefore draws a parallel to its users by becoming a patient.

THE ORIGINS OF THE TRANSCVAAL TOWN

Pretoria, the Transvaal town, was established in 1855, on the consolidated farms Elandspoor, Daspoort, and Nootgedact in the Apies River Valley with the Cardo and Decumanus running respectively East-West and

North-South, crossing Church Square, the ceremonial and focal point of the new

Transvaal town centre. The placing thereof was greatly determined by the succession of east-west stretching ranges of hills and valleys surrounding this centre (Hafting, 1991:147), (Jordaan, 1989:26).

The rest of the city was developed along a grid pattern that ran parallel to the central main axis. Furthermore, areas that surrounded town were zoned as town grounds and established as land for agriculture, pasture and reserved for the future expansion of the city. (Thomashoff, 1992)



Fig 2: 1889 Pretoria City Map SHOWING THE grid formation of Church Square in relation to Trevenna (Corten & Dun, 2009)

Church Square
Trevenna

TREVENNA

The Trevenna Precinct lies on the edge of the Inner City of Pretoria between the two oldest suburbs of the city, Sunnyside and Arcadia, at the confluence of the Apies River and the Walker Spruit. After the establishment of Pretoria as Capitol of the Union and later the Republic, the growing need for housing resulted in many inhabitants settling on the periphery of the city centre. Trevenna, Sunnyside and some parts of Arcadia were rezoned and turned into a high-density urban area.

These areas became a heterogeneous, successful urban place with a fine grain, created by the diverse mixture of residential, entertainment and trade, with a compact layout of the different sectors and ease of access to all parts. Although this occurrence was coincidental and unintentional,

it fell within the frame of sound Town Planning principles (Thomashoff, 1992).

Some of the physical remnants of this period include a few heritage residential houses, several Kirkness face brick garden walls and the Oost-Eind Primary School, which, due to its historical significance and contribution to the city's culture, in 1986, under the NMC legislation, was declared a national monument, and till this day, still stands (South African History Online, 2019).

THE "CITY LAKE" PROJECT

In 1987 the City Council of Pretoria embarked on an ambitious inner-city urban renewal programme aimed at bringing life back to the city. The Urban Vision included an in-depth redevelopment of the old tram sheds, new construction such as the Sammy Marks Square, a

commercial public square, the conversion of the Church Square precinct into a pedestrian mall and lastly, the construction of the "City Lake" project in Trevenna. The City Lake project was the council's attempt to connect the city to Sunnyside through an artificial lake located in Trevenna (Thomashoff, 1992).

"The planned construction of the lake and the freeway landowners in Trevenna way of maintaining and improving property. The council has also upheld a policy of non-development of public-owned land. Trevenna subsequently has a lower population density and has mostly been left out of the growth period experienced by the rest of the area, leaving a glimpse of old Pretoria and allowing a degree of urban decay to set in" (Coetzee, 1992).



Fig 3: Pretoria City Lake conceptual sketch (Smith & Pienaar)

Although the intend of this project was to further enrich the city by connecting the inner city with her suburban periphery through creation of visual and physical links therefore enriching the users experiential journey in the urban environment, the project was became unsuccessful due to its unrealistic ideals and poor and excessive planning that not only contradicted itself but also insisted on the construction of an artificial water body, ignoring the existing infrastructure of both the Apies River and the neighbouring Walker Spruit. (Thomashoff, 1992). Furthermore, the imminent failure of this project was a result of the way in which new commercial, retail and recreational facilities were forcefully envisioned to the fact that Another reason for the failure was the brutal way in which new commercial, retail and recreational facilities were being envisaged, without taking the prevailing context into account and enriching a single developer who negotiated a single mandate for the area from the City Council.

THE NEW VISION

The evolution of the Pretoria's "modernist city" focused on unrealistic ideals, poor principles and mislead urban planning that has contributed to the process of lost green space, decay and an concrete jungle that has resulted in the gradual abandonment and unsustainable, unbalanced and problematic "Urban Voids" with in the dense city fabric (Lee, Hwang and Lee, 2015). These "Urban Voids" have led to the increase in the dangers to the growth of the city and her inhabitants by contributing to the rapid increase and

development of unexpected and uncontrolled social conditions dispersed across the city creating an inherent detachment to the city's sense of place, therefore, endlessly deteriorating the existing the Pretoria inner city.

This dissertation's Urban Framework focuses on the exploration of the idea of "The Inner-City Urban Voids", specially addressing the gradual abandonment of some parts of the Pretoria CBD.

The continuous transformation of sites, whether it be through construction, or relocation of systems or productive activities, have created fractures within the urban tissue, leaving the city filled with latent interstitial landscapes with untapped

architectural potential. The urban visions aim to re-evaluate the current built fabric, specifically the quality of urban spatial structure and public and private spaces in both commercial and housing areas within the Pretoria CBD. The existing urban vacuums are identified, extracted and then categorised into 4 types- street, individual building, block and edge condition.

Focusing on experiences of renewal, regeneration and the reinstatement of the idea of a sense of place city, these 4 categories are explored to see how they could be reused and set into transience through 'green urban development' (Lee, Hwang and Lee, 2015).

Fig 4: Aerial photograph of showing the current state of the Trevenna Precinct (Google Maps, 2019)



Standard low-level systems and infrastructure which involve planting and greening and environmental high sustainable design which includes water preservation and conservation are applied and integrated into these derelict landscapes to potentially rehabilitate poor ecological conditions found on neglected and excavated sites.

The Urban Framework, therefore, extends itself into the theory of Ecopsychology and Therapeutic Architecture, focusing on the reintegration of nature into the city, conceptualizing and redesigning latent spaces to create a green link within the dense urban fabric that would be referred to as an "Urban Garden".

Due to its continuous transformation through excavation, halted construction, relocation of systems and productive activities, 75 Meintjies, Trevenna has become one of Pretoria's

biggest fractures within its urban tissue, leaving the city filled with a huge latent hole, an interstitial landscape with untapped architectural potential.

75 Meintjies, Trevenna is categorized as an urban city "block void" condition and falls part of the green link by becoming one of the biggest sites contributing the "Urban Garden". Therefore, the Trevenna precinct will be used as the block vision focus for this dissertation.

THE URBAN GARDEN

Vison's idea of the "Urban Garden", becoming the largest garden landscape within the green link. Through the investigation of Ecopsychology, Therapeutic Architecture the block vision sought to explore how the city can be rehabilitated and set into transience not only in programme or built form but specifically through the narration of the user's spatial

connection with site in an attempt to repair the inherent detachment to the city's sense of place, therefore, unravelling the users journey and revealing the potential mediation of the relationship between man, nature and architecture within the city.

The block vision identifies itself as an extension of the Urban

Working with a derelict site ties into the larger Urban vision of the dissertation, extending into the theory of Regenerative Design focusing on the rehabilitation of the poor ecological conditions found on the derelict and excavated site within the dense urban fabric. The investigation simultaneously creates a parallel between the site and the programme users of an Urban Hydrotherapy Cancer Treatment Centre, therefore, allowing the site to become a patient.

THE SCARED LANDSCAPE

Although the evolution of Pretoria's "modernist city" had led to the failure of the "City Lake" project, further unrealistic urban planning was proposed for Trevenna which subsequently led to the failure of any future development and the gradual abandonment of the precinct. In 2006, Trevenna was rezoned to become a business district forming part of the greater western commercial area of Sunnyside.

The area includes both the Department of Trade and Industries and the Department of Mineral Resources office blocks, the old Oost-Eind primary school that has been kept as a civil social facility and high-density residential, commercial and retail blocks on the eastern and southern edges of the area. The area is bordered by the tall Sunnypark

Shopping Centre and the Department of Tourism on Greeff street, with the Caledonian Stadium in south. The North, East and West borders of Trevenna are still defined by the Apies river and the tributary, Walker Spruit. Although both rivers have been canalised, they merely act as storm water channels, defined by infrastructure such as roads of the banks of the existing canals.

In choosing an area to work in, it was imperative to consider the current locations and designs of current cancer care centres. Cancer treatment facilities usually form a small part of a greater medical institutions such as hospitals and clinics or they are situated on the periphery of urban cities, deep with in suburban areas.

Their disconnect to the urban environment not only further impacts the health of patients,

but it has also greatly affected family, visitors, staff and doctors attitude, capabilities and responses to sensitive and traumatic real life and death experiences. Their dissociation with the urban environment prevents a sense of normalcy, further emphasizing the drastic changes or traumatic realities of one's journey towards their end of life.

Therefore, choosing to work in the dense urban fabric of the Pretoria CBD would be an appropriate site location as it has the power to reinstate the idea of "home" by creating a sense of normalcy or familiarity, inducing a sense of order, comfort and calm for all peoples involved, especial patients.

Fig 6: 75 Meintjies, dilapidated Site (Author 2019)

Fig 7: Large excavated hole filled with ground water found on site (Author 2019)



Fig 5: Pretoria CBD Urban Garden Perspective (Gerber 2019)



"The city is an artefact in continuous modification and the pulse for transformation has crossed, for a long time, the construction of urban fabric, its growth and its subsequent evolution" (Setti, 2013p.52)

Furthermore, in finding a suitable site to attain environmental regeneration and rehabilitation, various natural elements in the city were analysed and mapped such as water sources, rivers, excavations, mountains, ridges, open green spaces, post-industrial landscapes and most importantly latent urban voids. As a result, the most appropriate site found is the 14m deep large hole filled with ground water at the deepest northern part of Trevenna's central block.

Due to its continuous transformation through excavation, halted construction, relocation of systems, productive activities and poor urban planning, the largest part of the precinct is made up of a dilapidated desolated terrain that used to be the Oost-Eind sports field. This large site can be found in the middle of Trevenna, in its central block. Currently, the site, 75 Meintjies, sits as an excavated terraced landscape with a 14m drop that culminates in a large hole filled with ground water at the deepest northern part of the site.

During the basement construction of a major project allocated to this site, the builders hit a large amount of

ground water at the northern end of the site. All parties could not find a feasible solution to the excessive amounts of water found on site and therefore halted any further construction, which gradually led to the abandonment of the project and a scared landscape.

Due to its current state, the site is categorized as an urban city "block void" condition that contributes in the spontaneous development of the inherent detachment to the city's sense of place, therefore, incessantly deteriorating the remaining urban fabric. The site falls part of the Urban Visions "green link" by becoming one of the biggest sites with the potential to contribute the Pretoria's "Urban Garden". Therefore, the Trevenna precinct will be used as the site to achieve regenerative design.

Fig 8: 75 Meintjies, dilapidated Site (Author 2019)



THE HISTORY OF HEALING ENVIRONMENTS

The notion that nature was important to healing had been around for thousands of years— dating back to classical times, when temples to Asclepius, the Greek god of healing, were built far from towns, high up on hill tops overlooking the sea. The Asclepius temples were extraordinarily designed to bring patients closer to nature, to replenish their health, realign their mind, body and souls and showcase the healing qualities of the natural environment (Kreitzer et al., 2015).

During the 19th century, Florence Nightingale, English social reformer the founder of modern nursing, through her exploration of medical science, noted the significance of the natural qualities of nature, light, fresh air, touch, diet, noise control, and spirituality as

the fundamental elements that contribute in the process of healing and the creation of therapeutic environments. She emphasized that medical professionals should, "...put the patient in the best possible condition so that nature can act, and healing occur" (Kreitzer et al., 2015).

THE 20th CENTURY SHIFT

During the minimalistic paradigm of the 20th century, in the quest to attain modern civilisation, man's ideals had shifted, and his dependent relationship to the natural environment was abandoned as needs dictated that modern man and his built environment were more important and more powerful than nature. As man turned his back on the natural environment, unknowingly, he had compromised his very own existence and nature, his primary source of healing, had been affected too and started

contributing in creating ailment for its inhabitants. This drastic disconnect with the natural environment had resulted in the rise of "diseases of affluence" (Murray 2005).

"Diseases of affluence" refers to specific ailments, diseases and other health conditions which are generally the consequence of increasing urbanisation a society. Some of these diseases are typically chronic non-communicable diseases (NCDs) and additional physical conditions that affect private lifestyles and social circumstances related to economic development are significant risk factors — such as cancer, coronary heart disease, cerebrovascular disease, peripheral vascular disease, type 2 diabetes, and hypertension (Murray 2005).

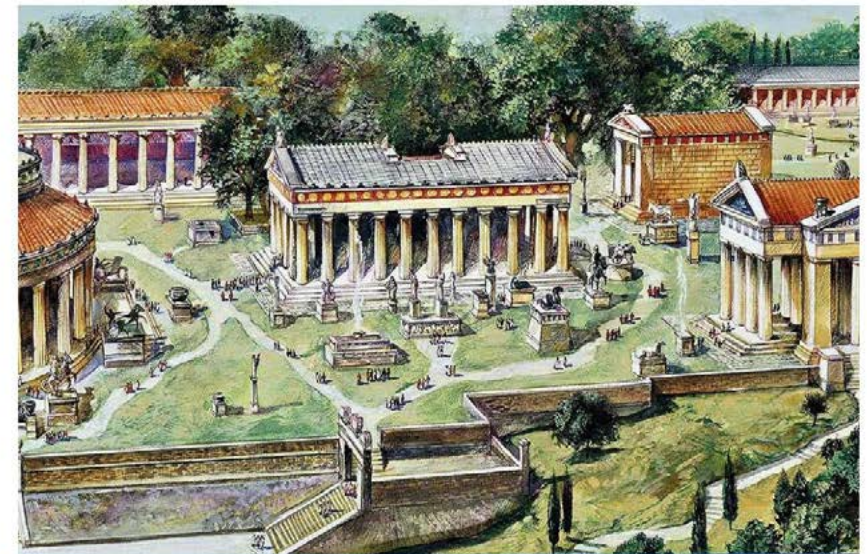


Fig 9: The heart of the Epidaurus sanctuary: the Tholos and the Abaton (left) and the Temple of Asclepius (center right) located at the top of a hill, immersed in the natural landscape (Greece 1s, 2019).

By the 21st century, in search to find cures, the increase in technological advancements

led to the rapid evolution of medical science and an institutional architecture where state-of-the-art healing environments such as hospitals, clinics, day care centres and hospices, were all designed to accommodate state of the art equipment, which led to a focus on functionality and rationality of form which has greatly affected patient recovery time which led to inhumane "healing" environments rather than a human centred approach the focused on the human body being central to an experience that is medical, sensorial and spatial.

The intent of healthcare facilities had changed and redirected towards the design of healing environments that focused on researching and attaining a body of knowledge that would not grow beyond the curing of illness and therefore excluded "full" patient recovery and overall wellness and well-being (Kreitzer et al., 2015).

THE 21ST CENTURY TYPOLOGY

Existing South African medical facilities are synonymous with the prison system, in efficiency, form, function and by the way in which they isolate patients from public and external environment (Mashta, 2010). This isolation interrupts rehabilitation as it delays recovery and consequently, patients become a replication of their environment.

Roger Ulrich, a Professor at the Department of Architecture and

Centre for Healthcare Architecture at Chalmers University of Technology, has explored the theory of Therapeutic Architecture and has argued that the physical and mental healing capabilities of a place, space and building determine their ability to effectively induce a healing setting.

Though, the therapeutic properties of such a setting should overshadow any other concerns, many professionals such as architects, therapists and sociologists, have contended about the healing capabilities of such a place and the physical potential and form of its spaces that have the capability to initiate healing. These elements become an essential part in the individual long-term care of patients, specifically in the recovery process for social, physical and emotional vulnerability as consequence of terminal illness.

Medical professionals, environmental theorists' psychologists and interior designers are starting to realise the significance and impact of natural environment when it is combined with in the to the healing process. Their studies have questioned the current institutionalised healthcare facility typologies that do not empathise with their patients, families or staff, the focus is rather on rationality, functionality and efficiency. (Ulrich, 1992; Devlin & Arneill, 2003, p.665).

THERAPEUTIC ARCHITECTURE

The idea that a building can induce healing derives from the concept of Therapeutic

Architecture, which according to According to Evangelia Chryssikou, refers to "the people-centred, evidence-based discipline of the built environment, which aims to identify and support ways of incorporating those spatial elements that interact with people physiologically and psychologically into design" (Chryssikou, n.d.)

The concept does not suggest that architecture can heal, but rather through architectural manipulation and transformation of space designers can create multiple platforms for natural elements such as light, sound, colour, views, and textures to induce a healing environment that would in turn positively affect the physical and psychological well-being of people.

"Connection to the natural environment has been shown to improve overall healthcare quality in multiple ways by reducing staff stress and fatigue, increasing the effectiveness in delivering care, improving patient safety, and reducing patient stress. All this leads to improve health outcomes and patients who are happier and heal faster. Hospitals foster this by having views, natural light, and access to gardens or the outdoors."

- Whitney Hopkins (Hopkins, 2018).

Therapeutic Architecture combines the four principles of "green care" through evidence-based design approaches in in healthcare typologies to induce humanistic psychology and nature-based healing (FAQ,2019). The applications and techniques of these principles are specifically incorporated in the designs of medical facilities and other alternative therapeutic programmes to address certain juvenile corrections and create an intense curative experience through the healing power of nature.

The 4 basic principles of Therapeutic Architecture applied in the design of healthcare typologies are;

1. **Ecopsychology** which refers to the immersion of patients in the natural environment for them to develop personally and improve their sense of well-being and create a sense of awareness of the mutual dependency that exists between man and nature
2. **Biophilic Design** involves the incorporation of the Evidence Based Design (EBD) therapeutic qualities of nature and use of the environment applied in the design of public buildings to improve health and well-being whilst benefitting the environment.
3. **Phenomenology** is an approach that suggests a certain space can interact with the body's sensory perceptions to invoke emotive feelings, thereby transmitting subliminal

'truths' – like tranquillity, stillness and relaxation – to the semi-conscious.

4. **Regenerative Design** involves the active the actual remediation of a scared landscape through Biomediation

These concepts focus on the integration of the therapeutic qualities and sustainability precepts of nature in healthcare treatments and typologies, human-centred design, and the emotional sensorial experience, which will all be investigated to create a basis for the theoretical framework and play an integral part in design and form of the an urban Hydrotherapy Cancer Treatment Facility. (Mazuch, 2017).

Due to the nature of the site and the large ground water body found on site, this essay specifically explores the water as a spatial and physical healer through hydrotherapy. The project aims to explore the natural and therapeutic qualities of water and how these qualities can then be interpreted spatially to create and facilitate a stimulating an alternative healing environment for cancer patients, family and staff in both public and private urban space while simultaneously inducing the remediation of a once scared landscape through regenerative design.

Therefore, Therapeutic Architecture is explored as the foundation for the nature-based transformative cancer treatment facility and how it's incorporation and design in a clinical setting to induce a

healing environment for its users while simultaneously repairing the broken link between man and nature. The theory will be explored and derived from the qualities of nature and reinterpreted into spatial forms that would contribute in producing an environment that promotes resilient health in both nature and its users, therefore shift the current condition from "humans versus nature" to "humans with nature" (Gardiol, 2016).

Fig 10: The complex inter-relationship between environment and user.

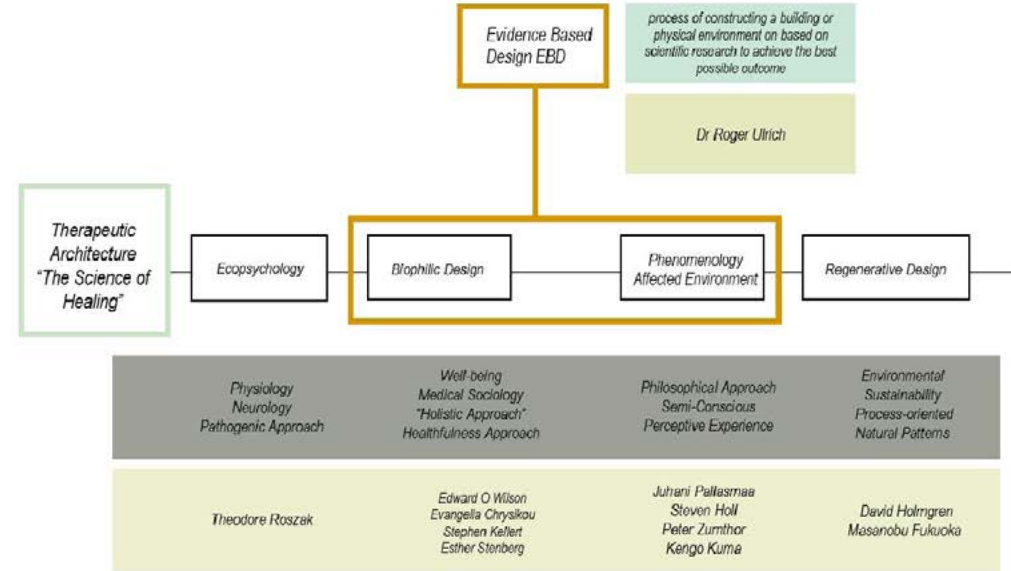
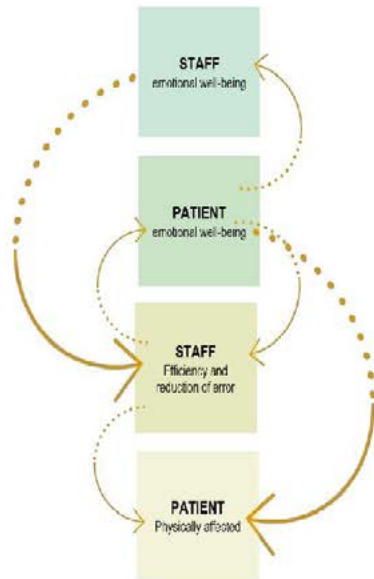


Fig 11: Therapeutic Architecture Principle Spectrum (Author 2019)

AWAKENING THE ECOLOGICAL UNCONSCIOUS

In 1923, the cultural historian, Theodore Roszak first coined the term "Ecopsychology" and defined it as the innate connection that man has with nature (Roszak, 1995). Roszak suggests a new synthesis of psychology, cosmology, and ecology as the cure for symptoms of modern man's denial of his reliance to the natural environment and failure to take responsibility for the damage that his disconnect has caused, to initiate meaningful change. Roszak's creation came about through the ideas and combination of the emotional understanding of therapists with the scientific proficiency of ecologists to create a innovative theoretical field that extends itself far

beyond the idea of individual healing to include an extensive cultural scope that redefines and re-imagines society's current broken relationship with mother nature (Roszak, 1995). Ecopsychology seeks to explore this connection and restore the bond that has become increasing concern in urban environments.

"We need a new discipline that sees the needs of the planet and the person as a continuum and that can help us reconnect with the truth that lies in our communion with the rest of creation," Roszak (Simon and Schuster, 1995)

This new social and intellectual movement strives to understand the idea of "ecological conscious" and harmonize people's relationship with the nature through the

examination of the eco-based psychology that has been integrated with psychological insights with the grassroots environmental to make an awareness of man's current alienation and dependence on nature (Roszak, 1995). Ecopsychologists have integrated both ecology principles and psychology perceptions to change the current ecological action to centre around environmental thought processing and interaction with the natural world for psychotherapeutic purposes, individual healing and individual growth. Through Ecopsychology, users can generate lifestyles that are ecologically sustainable and psychologically healthy (FAQ, 2019). The concept is broken down into 3 parts that all provide imperative understandings into

cognition, psychological well-being and an emphasis on the human experience. Firstly, there is the exploration of the deep connection with the inherent mutual relationship between people and nature, this is explained through the ideas of nature being both a home and family as well nature as the symbol of the "collective self". Secondly, it identifies the disconnect as a means of mutual suffering

through ecological destruction grief and alienation. Thirdly reconnecting with nature encourages individual healing,

psycho-emotional attachment, ecological action and sustainability. Through the immersion of patients in the natural environment, Ecopsychology promotes personal development, improves the sense of wellbeing and creates a sense of awareness of the mutual dependency that exists between man and nature. Through this application in the cancer care patients are naturally encouraged to make sustainable choices and

lifestyles as they become aware of the importance of the intricate interconnection between human and environmental health. Ecopsychology is a new field that aims to simultaneously heal the mind and surrounding environment. Initial studies suggest that access to green space and exercising in natural environments can induce these physical and psychological benefits (Roszak, 1993).

NATURE'S CURE: THE BIOPHILIC MODEL

Biophilia, like the theory of Ecopsychology, refers to the innate human attraction to nature and natural processes with in it. Biophilia, "meaning love of nature" suggests that man's inherent link to the mother nature was developed over many years of the agrarian era

The word "Biophilia" was coined by Edward O Wilson, an American biologist, in the 1980's, as he observed the growing rates of urbanisation and how they were leading to a withdrawal of man from the natural world. The importance of Biophilia has become directly proportional to this drastic increase in urbanisation in developing countries, and therefore has become an importance to our health and well-being in the built environment

"Our biophilic needs is an adaptive product of human biology, and the satisfaction of our biophilic urges is related to human health, productivity and well-being." (Kellert, 2005)

In 2005 Stephen Kellert, a respected professor of social ecology at the Yale, who helped pioneer the theory of "biophilia", noted that there are 70 physical features of biophilic design that can be integrated in Architecture to create a simulating healing setting (Kellen 2008: 21-31). These principles are further divided into two biophilic scopes, the first being the Organic dimension and secondly the a Place-based dimension (Kellert 2008: 4).

1. The Organic dimension is defined as "shapes and forms in the built environment that directly, indirectly or symbolically reflect the human affinity for nature" (Kellert 2008: 4). The experience includes an unstructured contact with the environment and indirect experience that includes the on-going interaction with nature that needs the human involvement to survive. Symbolism is created through the representation and imaging of the natural world.

2. The Place-based or Vernacular dimension refers to buildings and landscapes that connect to the culture and ecology of a locality or geographic area. This consist of the genius loci or spirit of place emphasising how buildings and landscape of meaning to people become integral to their individual and collective identities (Kellert, 2005).

Wendell Berry commented: *"Without a complex knowledge of one's place on which such knowledge depends, it is inevitable that the place will be used carelessly and eventually destroyed"*. (Berry, 1972: 68)

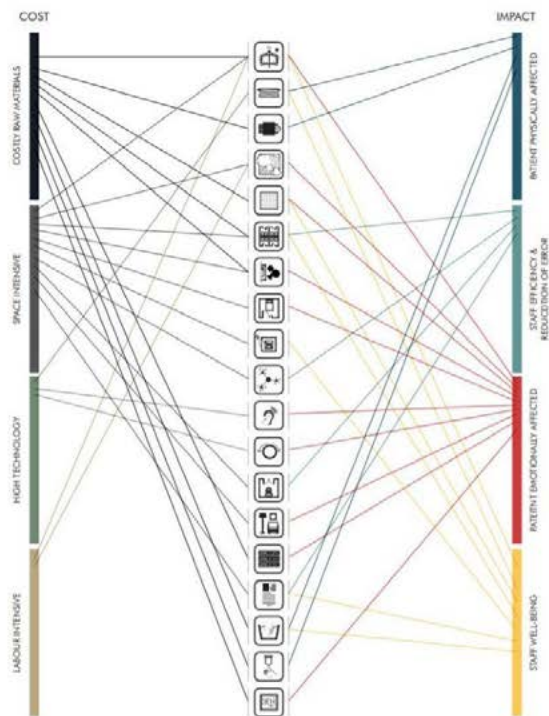


Fig 12: Key of common EBD features (Lee, 2015)

Nowadays, regardless of the need to travel the world, people still have a strong need for "home" that they can return to. This connection to the sense of place is still the major reason people undertake responsibility and enduring care for the maintenance and conservation of buildings and landscapes. The built environment consists of an increasing disintegration of connection to place and has unfortunately become a typical representation of modern society (Kellen 2008: 6). These two dimensions of biophilic design are then further explored. These elements include (Keller 2008: 6):

1. Environmental features
2. Natural shapes and forms
3. Natural patterns and processes
4. Poetics of light and form of space
5. Place-based relationships
6. Progressive human-nature relationships

The to six biophilic design elements are further elaborated and applied through the principles of Evidence Based Design to produce a human centred method that is used to enhance the spatial experience of form with many benefits to our health and well-being (Keller 2008: 6). Evidence-Based Design (EBD) is the rational approach to biophilic design that applies scientific observations to design principles. Established by Professor Archie Cochrane as a derivative of evidence-based medicine, this approach can be defined as the therapeutic design choices made based on the best accessible material from reliable research and

assessment of existing projects (Stankos and Schwarz, 2014).

This EBD approach make both patient and environment observational studies to determine environmental factors that may be supportive of healing. Discussions or findings are subject to a process of peer-review and macro studies to generate a central repository that serves as a basis for informing future architectural design.

Biophilic Design uses EBD to explore the many ways in which nature can contribute to health and well-being. Natures innate beauty can solely induce stress relief, improve moods, mental restoration and create a relaxation environment.

Dr Roger Ulrich, a Professor of Architecture at the Chalmers University of Technology in Sweden, is well-known for his work in therapeutic architecture and his exploration in evidence-based healthcare design.

Through extensive research and practical experiments with patients, the professor theorised and discovered the 'power of the window' through a medical experiment that validated the fact that patients in hospital recovered faster when their ward rooms had a unobstructed view of the external natural environment rather than a blank wall (Ulrich, 1991).

"A window is not seen merely as a functional necessity that provides light and ventilation, but also a gateway that has the ability to transport a patient from a harsh reality to a place

of contemplation, serving as a temporary escape. 11 Society has begun to favour nature as a result of our association with nature as a restorative experience, while we associate our everyday urban settings with traffic, frustration, congestion, stress, crime, and pollution, which result in our psychological desire to escape it." (Ruga, 1989)

Ulrich further introduced the concept of "framing views" through the experiment and observation of engaging patients with specific natural elements such as water features, flowers and trees in outside which encouraged a moment of reflection and self-awareness, which served as diversion from pain and suffering (Basson, 2014). The idea also produced environments that induced comfort and relaxation, which increased patient recovery time by creating a perceptive environment that would allow patients to experience the external world rather than being viewed and assisted by others, therefore, moving away from the sterile design and poor qualities of medical institutionalisation (Ulrich, 1991).

Dr Roger Ulrich suggests that there are four possible reasons for the positives effects that nature has on humans (Ulrich, 1991):

1. The association with nature through physical activity eventually stimulates positive health.
2. Socializing is directly linked with nature, this is done by doing mundane activities while being immersed in nature, like walking, socialising with a

friend or seated on a park bench.

3. Nature inherently provides a temporary escape from the realities of everyday life.
4. Mother Nature herself has a powerful influence the brain.

Other experimental findings in EBD include the use of effective ventilation systems with reduced infection transmission (hang et al. 1293; Boswell and Fox): the incorporation of sound-absorbing floor coverings with the improvement of sleep quality (Philbin and Gray 455) and the preference for controlled sunlight access for better pain and sleep management (Wakh et al. 156; Bahammam 6). A wider analysis of findings identified a complex inter-relationship between patient healing, staff productivity, and environmental conditions (see Figure 7). These findings areal firm by a macro-study by Ulrich et al.

WATER AS A SPATIAL AND PHYSICAL HEALER

Due to the nature of the site and the large ground water body found on site, this paper specifically investigates the ways in which presence of water – either as a feature or a function – can be incorporated into the design of the proposed hydrotherapy cancer treatment facility. The proposed project aims to explore water as an extension of biophilic design and how its therapeutic qualities of this element can then be interpreted spatially to create and facilitate a stimulating an alternative healing environment for cancer patients, family and staff in both public and private urban space, how this relationship is

perceived through sensory human experience and how it can inform and enriched the design of a building, while simultaneously inducing the remediation of a once scared landscape through regenerative design.

"Water is the supreme sculptor of our environment" (Campbell, 1978: 9)

In the history of the world, water has always had an influence on the human existence. Though having experienced some transformation, water still remains an essential of all life forms, making up to 70 percent of the earth's surface and unquestionably necessary for every form of life. It is the uniting element of nature, linking all the different facets of the natural landscape.

Kellert developed a Biophilic water-based framework that provides a comprehensive understanding for the many ways in which humans are attached to this natural source. The pertinent relations with water are emphasized below Kellert (1997:42) (2005: 51-57):

1. Humanistic: the ability of man to form a bond with this natural element, to value its existence, its significance in his sense of place, and its value as a life-giving element
2. Aesthetic: This includes all the aspects of water that are found appealing to our five senses.
3. Moralistic: the sense of valuing the gift of this resource; the obligation to preserve it; equitable sharing among human and non-human users

4. Symbolic: a brook communicating to us through the gurgling of its falling waters; the strength and power of the flow of a vast river
5. Scientific: lessons of aquatic chemistry, ecology and biology Kellert (1997:42) (2005: 51-57).

Experiences with water in the city, functions between cold and warm, airy and saturated, up and down, intimate and public to artificial and natural. This proposal aims to portray how the architecture of the building can be informed by this shape shifting element and through its spatial manipulation, water in its various states can be explored and exposed to draw contrasts and similarities between itself and the users of the cancer treatment facility, highlighting the various ways in which this natural source can be experienced within an urban environment.

Water will appear as a boundary between public and private spaces through the creation of thresholds, hierarchies, axis, volumes, surfaces and the through its incorporation in the design of the poetics of light, sound, rhythm and movement in the design of space and form. Water will be used in a wide range of expressions to create a sense of place that will enhance well-being; a healing environment where senses and impressions can be experienced freely. The water will appear in the forms of vapor, mist, water drops, heavy and light rains, reflection pools and at different heights, to support the different water movements and activities, characters and atmospheres

that will induce a healing environment. The water is used to create atmosphere and that positively affect the human state of mind.

EFFECTS OF LIGHT, SHADOW AND COLOUR PSYCHOLOGY

Before the discovery of antibiotics in the 1930s, the healing power of the sun was a favoured as an alternative treatment supported in the healthcare community. Sunlight therapy, also known as heliotherapy, introduced in the late 19th to mid- 20th century, was the most successful treatment against infectious diseases.

Medical research has shown that patient exposure to controlled amounts of sunlight intensely decreased high blood pressure, lowered elevated cholesterol found in patient blood streams, lowered abnormal high levels of sugar in diabetes and improved the amount of white blood cells in the body, which people need to help fight against disease.

By 1933, studies there were over 253 different viruses that sunlight was used to treat

"Patients suffering from gout, rheumatoid arthritis, colitis, arteriosclerosis, anaemia, cystitis, eczema, acne, psoriasis, herpes, lupus, sciatica, kidney problems, asthma, and even burns, have all received great benefits from the healing rays of the sun" (Basson, 2014).

However, due to the rise of the modern era, the shift towards man's dependence on technology led to the growing power of the pharmaceutical

industry, and therefor heliotherapy was no longer used as a core treatment in medical institutions (Basson, 2014).

Biophilic design recognises the significance and benefits of Sunlight and how through architecture it can be perceived as a form of psychological motivation to establish a healthy, therapeutic environment. Natural sunlight recognised as elements with the ability to induce healing and thus should form as part of detailed design of the cancer treatment facility (Basson, 2014).

The balance or imbalance of a space can effortlessly be changed by adjusting the quality play, poetics and

manipulation of light that can be combined with forms, colours and other natural elements such a water to create a sense of place, therefore, enhancing patient experience, transcending individuals into an alternate state of consciousness that could essentially be recollected in memory, after its lived experience during recovery (Basson, 2014).

Colour psychology has also been recognised as a significant device in Biophilic Design that has a positive effect on human behaviour, emotions and moods in any giving environment, especially when associated with the healing effects of nature (Cynthia et a.2000). Research



Fig 13: Colour wheel of emotional psychology (The Interaction Design Foundation, 2019)

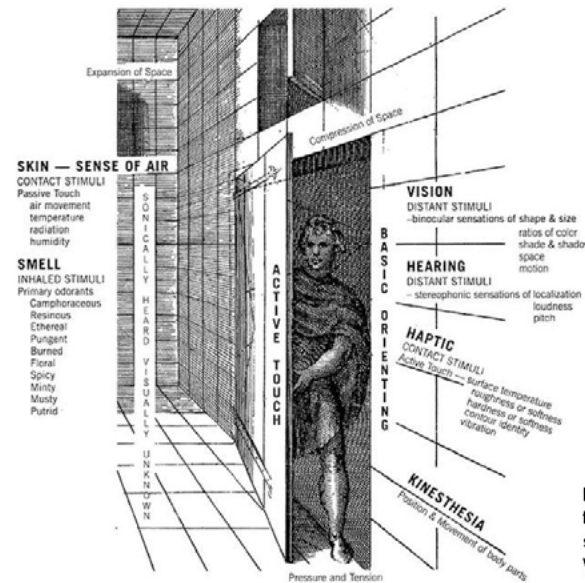


Fig 14: Illustration of the different ranges of the senses that can be enhanced through spatial exploration, design (Malnar & Vodvarka 2004),

Pallasmaa further explains the integral and directly proportional relationship between our natural surroundings and sensory perception by stating that they have a definite influence on our emotions and reactions, and therefore in essence participate to the method of healing within a space.

In his book, *"The Eyes of the Skin"*, Pallasmaa explains how;

"all the senses, including vision, are extensions of the tactile sense; the senses are specializations of skin tissue and all sensory experiences are modes of touching and thus related to tactility. Our contact with the world takes place at the boundary line of the self, through specialized parts of our enveloping membrane" (Pallasmaa, 2005:12)

the Finnish architect describes how in the absence of the human senses, specifically touch, sound, smell, sight, has greatly affected and contributed in the creation of our impoverished environments, whether it be room, building, landscape or urban city, this absence has consequently formed a sense of impassivity and hostility.

He states that: *"The very essence of the lived experience is moulded by hapticity and peripheral unfocused vision. Focused vision confronts us with the world, whereas peripheral vision envelops us in the flesh of the world"* (Pallasmaa, 2005:12) suggests that the process of healing is not linear and occurs through

specific molecules of the brain that are in control of articulating our internal auditory perception, through the combination of various signal that allow the five senses of the body to perceive its direct surrounding environment.

The body's emotional response to its surrounding unconsciously stimulates the immune system which fundamentally induces healing (Barbara, et al. 2013). According to Esther M. Stenberg's book *"Healing Spaces: The Science of Place and Well-Being"*, the body's cognitive awareness is made up of chemicals and nerves that regulate and all experienced moods while simultaneously receiving the information through the senses to create an image of the perceived and experienced idea of place (Stenberg, 2010).

The change in mood and improvement of well-being is an unconscious consequence of the perceived sense of place; as an environment changes, so does the emotive response of the body to it. The bodily perceptions can be experienced as the portal that between our emotions and apparent reality.

Therefore, the architecture of a hydrotherapy cancer treatment facility can act as a catalyst for connection and be described as the tailor of our sensory perception, a portal linking form, space and the sensual experience to either deprive or stimulate all the human senses in order to finally articulate an intense healing experience.

REGENERATIVE SYSTEMS FOR A RECONCILED LANDSCAPE

Due to its continuous transformation through excavation, halted construction, relocation of systems, productive activities and poor urban planning, the largest part of the Trevenna precinct, 75 Meintjies, is made up of a dilapidated desolated terrain that used to be the Oost-Eind Primary School sports field.

The consequences of the failed construction on site has led to a terraced landscape with uprooted vegetation, abandoned buildable material and rubble, exposed services and visible scarring that gradually increases on the sloped site that ends in a deep excavated hole, filled with ground water. This site is categorized as an urban city "block void" condition that contributes in the spontaneous development of the inherent detachment to the city's sense of place, therefore, endlessly deteriorating the existing city periphery.

The site falls part of the Urban Visions "green link" by becoming one of the biggest sites with the potential to contribute the Pretoria's new "Urban Garden" framework. Furthermore, working with a derelict site ties into the larger vision of Therapeutic Architecture, extending the theory of into Regenerative Design which focuses on the

rehabilitation of the poor ecological conditions found on ruined and neglected sites. Through its regeneration, the site becomes a patient in its own right.

Regenerative Design refers to an architecture that aims to remediate the dichotomous relationship that humans have with nature. It aims to merge and restore this integral part of the intricate and interconnected web of life. Damage to any part of this network effects and causes harm to every other counterpart (Crous, 2016). This design approach surpasses biophilic design as it does not simply recommend using the therapeutic qualities of nature as a foundation for the reconnection between man and nature but rather extends itself to include the exploration of sustainable precepts and the recommendation of green technologies to support and assist in the reparations of the current disconnect and remediate any natural processes that may have been lost or broken due to modern man's disassociation to the natural environment (Van Eeden, 2013).

"By obtaining the re-sources necessary for operation from its direct environment, and

The practice uses the integration of architecture back into the natural landscape as a systematic environmental tool that aims to improve and sustain all living conditions. The practice highlights how, through certain architectural models, buildings can be designed to explore, initiate and contribute in the reparations of the processes and ecosystems suffering or destroyed in the natural environment (Van Eeden, 2013).

Regenerative Design proposes the immersion of man back into nature to create a restored and resilient interdependent secular web of life, therefore, changing the connotation from "human versus nature" to humans with nature". The theory suggests that humans should not accept the apologetic destroyers that they have become, always finding ways in which they can minimize their damage, but should rather seek to become the co-creators of the natural environment and contribute in the design and development of planetary systems, natural patterns, sustainable tools and propose evolutionary programmatic functions that explore, adapt and improve nature's ecosystems, with the hopes to achieve high levels of diversity, resilience and abundance.

"By obtaining the re-sources necessary for operation from its direct environment, and

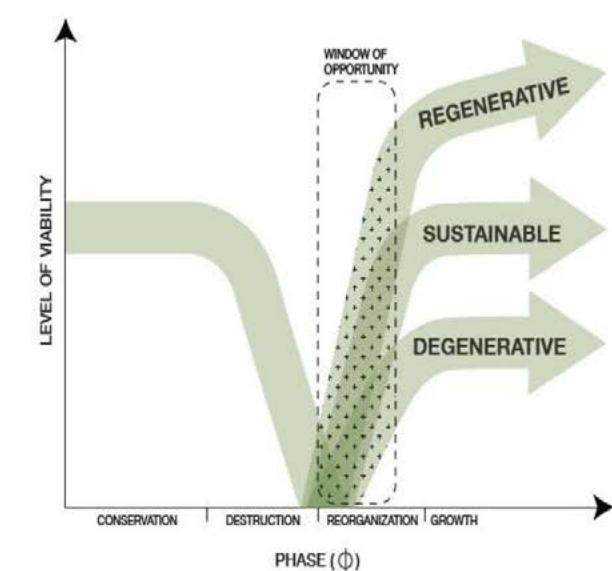


Fig 15: A window of opportunity for reorganization and new trajectories (Oliver, Thomas & Thomson, 2013)

generating energy, regenerative architecture replenishes the resources it consumes without producing waste" (Boardman, 2010:55), (Nugent, Packard et al. 2011: online).

HEALING THE LAND THROUGH BIOREMEDIATION

It is evident that the 21st Century world is undergoing an existential crisis where the cost of living has led to global consumption and ecological degradation, solidifying the tangible risk and reality of the looming self-inflicted extinction of man. Through Regenerative architecture, designers have understood that mans continued existence has culminated at a crucial point between survival and decay and have proposed an environmental model that has taken on the role to become

the restorative archetype with an aim to revert back to natural systems, with their inherent self-organizing abilities, to their original state (Batista & Matos 2013: 116).

Through this method, architecture is applied as a regenerative tool, Bioremediation, an applied theory that actively investigates, remediates, manipulates and reconstructs any contaminated environment.

Bioremediation is used to treat infected elements in nature including water, soil and subsurface material, by changing various ecological patterns, sustainable tools and propose evolutionary programmatic functions that explore, adapt and improve nature's ecosystems, with the hopes to achieve high levels of diversity, resilience and abundance.

The restoration the site comprises of different stages of involvement. These stages are applicable on both an urban and site-specific scale and can be introduced through at a building scale. The first stages of Bioremediation include the investigation of traces of pollution from earlier industrial activity that are inspected and understood at a macro and micro level. It then becomes clear which elements of the landscape such as soil, water, topography and vegetation, have been infected and will be restored through the practice.

The degraded "left over" aspects of the site such as dust, refuse and contaminated soil should provide new materials for conceptualization, expansion and use. (Borasi & Zardini, 2012: 25).

Bioremediation primarily broken down and will be applied in the following 3 principles:

1. **Phytoremediation** which refers to the direct use of living plants for the clean-up, in situ, or in place, removal, degradation, or containment of in soils, air, vegetation or surface water and groundwater.
2. **Biostimulation** includes the transformation of the site to stimulate existing bacteria with the abilities of bioremediation. This can be done by addition of various forms of rate limiting nutrients and electron acceptors.
3. **Constructed Wetlands** refer to the adaptation and improvement of already existing water bodies or the design of artificial infrastructures filled with water-loving plants and algae to improve the growth of helpful microbes.

Due to the heavy presence of water on site, bioremediation through the constructed wetland will be used as an essential tool in the regeneration of the site. The water found will not only be treated for any contamination, but also be used as a significant tool, a catalyst, in the remediation of the scared landscape. By exposing this natural element as an architectural device, hydrology becomes an embedded layer in the building and the human

environment with the potential to implement cohesive interventions that seek to replenish and initiate the regrowth of vegetation, natural ecosystems, processes, patterns and organisms that were once destroyed.

Water is therefore used to therefore transform the site from and "Urban Void" to the "Urban Garden" connecting it back to the inner city's new "green link" framework. In doing so, through the design of the hydrotherapy cancer treatment facility, water becomes the physical and spatial healer of the site with its use centred around its therapeutic qualities, harvesting, reticulation and restorative abilities for both its uses and the physical landscape. Water is used to create a spatial atmosphere that provides an immersive and constantly changing spatial experience with the ability to induce an intricate and effective healing environment for both patients and the city.

As it is celebrated through the public realm, the poetics of water are visibly enhanced, and its meaning in the urban environment is therefore strengthened.

The design of a Hydrotherapy Cancer Treatment Centre will serve regenerative tool in the remediation of the natural ecosystem found on the dilapidated site, in an attempt to return the landscape to its intrinsic abilities, while concurrently reconstructing the site through architectural design principles into a new socio-ecological environment.

shows that through their combination, architecture and colour can visually stimulate the mind, therefore provoke or elevate the positive or negatives emotions and connotations that patients relate with their surroundings (Dalke, 2004).

According to Johan Basson's dissertation on Adaptive healing;

"These emotions are triggered through our mental perceptions of colours in relation to the association of these colours with certain past personal events or cultural beliefs. Society's emotional response to colour is based on shared psychological associations of certain emotions to certain colours" (Basson, 2014).

Therefore, the design of the treatment facility should aim to positively contribute and realign Architecture's role in the design of health institutions to integrate the positive powers and effects of light, shadow and colour psychology into contemporary healing environments to encourage and inspire specific emotional responses and use it as a tool to change and control the experience of desired healing spaces (Basson, 2014).

THE MANIPULATION OF PHENOMENA AND SYSTEMS

Phenomenology refers to the psychological field of design that has become an extension of Therapeutic Architecture. Defined broadly as the "study of structure of experience or consciousness" (Stanford Encyclopaedia of Philosophy),

contemporary architectural phenomenology suggests the opportunity of designing for the spatial experience. This approach posits an environment can participate with the body's innate sensory needs to stimulate and emotional connection with the sense of place and form of space (Lee, 2015).

Phenomenologist, a Finnish architect and professor at the Helsinki University of Technology, Juhani Pallasmaa, attributes the pathology of everyday architecture to "the negligence of the body and the sense" (Pallasmaa, 2011) arguing that the lack of a multi-sensory spatial experience leads to "a [de]strengthened [sense] of self" (Pallasmaa, 2011).

THE CONCLUSION

Therapeutic architecture lies within the 21st century "ecological paradigm" that looks to unveil the balance that inherently exists between man and nature. As a result, it identifies as an ethos does not only recommend the formalistic qualities and strategies to achieve this mutual and equal relationship, but through, Ecopsychology, does encapsulate the mind shift that is rooted in sustainability.

Therapeutic Architecture offers design approaches that can be implemented at a humanistic and urban scale to return and heal all living elements part of the natural environment.

The theory primarily addresses how a building can be designed through various ecologically driven models and interventions that apply natures genius, self-reliance and healing quality at a macro and micro level through services, infrastructure and details to support and recreate the link between humans and their natural environment, architecture and landscape, therefore shifting the current mind set from humans versus nature to "humans with nature" which simultaneously changes the architectural connotation from "building on landscape" to building with landscape.

By embedding the conceptual idea and development that a building can heal, it becomes clear how many ways in which Therapeutic Architecture can become the foundation for the theoretical framework of this proposal. This article aims to investigate ways in which the theory is implemented through 3 applied theories that

include Ecopsychology, Biophilic Design, and Regenerative Design which are all evidently interlinked and guide the function and form of the building to become a holistic spatial healing experience. These concepts tackle and portray how through Therapeutic Architecture, the different approaches how healing, reconnection, interaction and celebration between man and nature can be initiated through architectural expressions.

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