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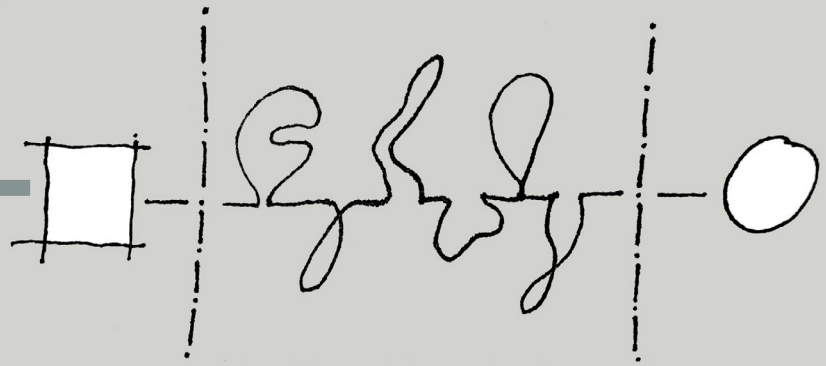

A Water Only Fasting Center

Penelope Vorster

This dissertation is submitted in partial fulfilment of the requirements for the degree M.Arch. (Prof). All the work contained in this document is my own except where otherwise acknowledged.

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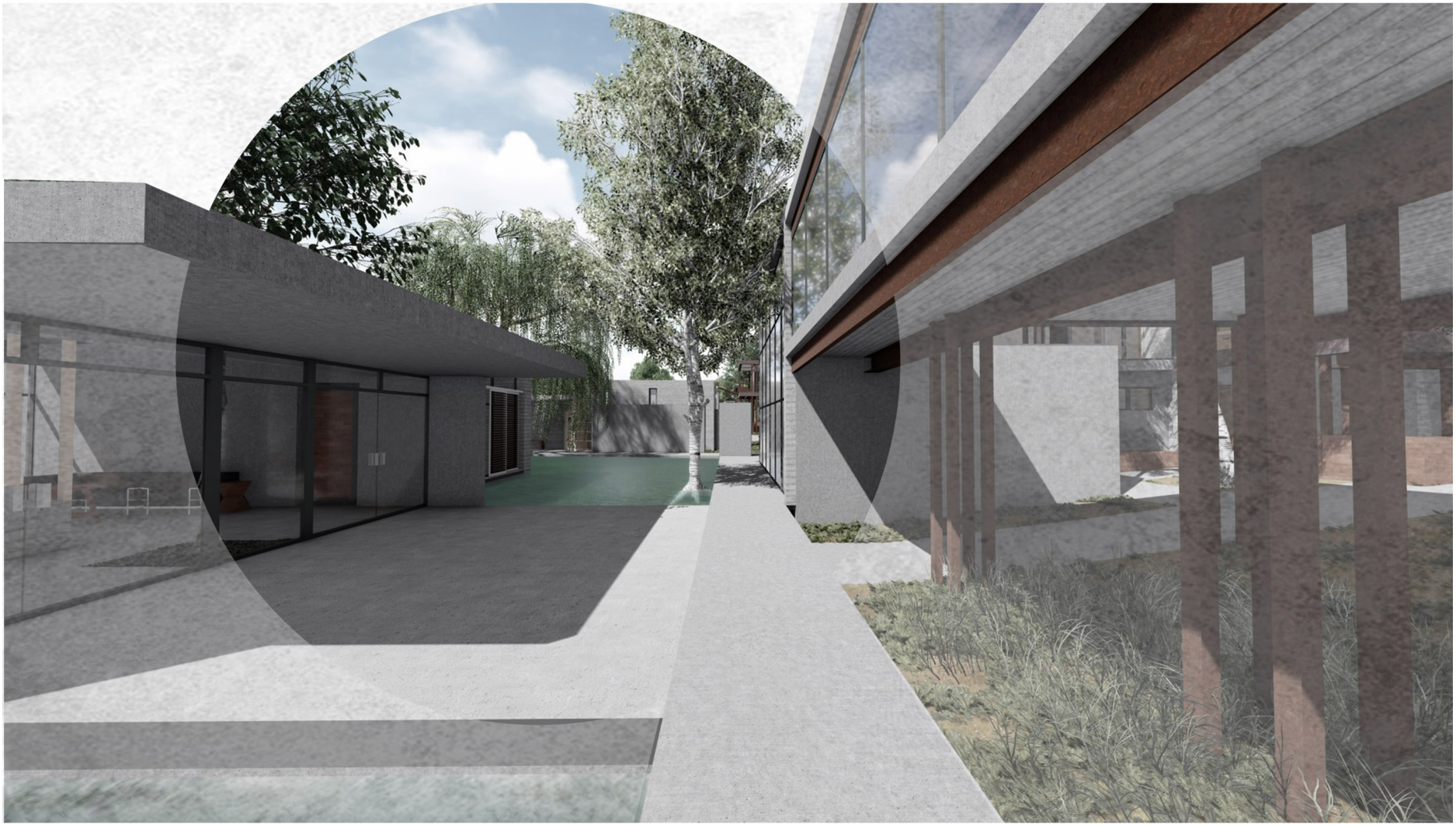
Declaration of original authorship:

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



PREAMBLE

This design dissertation investigates the proposal of a Water Only Fasting Centre, 7 Dams, Bloemfontein. The project aims to become the third fasting center in South Africa, and the second owned by Dr Karalis. My interest in water only fasting stems from an interest in natural remedies and homoeopathy. A string of poor health lead to the discovery of the wonders of nature and its ability to heal, without nasty side effects. This being said, western medicine is imperative, and the gap between the two medical fields became apparent. The study thus aims to use the in-between, the gap, or the liminal, as an architectural space of healing and knowledge.

The paper is divided into 6 main parts. The fist situates the project and its rationale, using a explorative touchstone as a tool in which a lens can be produced to focus the investigation. Part two highlights challenges and aims of the dissertation and the third explores and grounds the proposal through research and investigations into the typology, topology and morphology. The next section involves a technical report in which the design is quantified, in terms of type, form and site. The fifth synthesises the findings throughout the paper into a design and technical solution. The final part is a reflection of the successes and shortcomings of the project.

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PART 5 DESIGN AND TECHNICAL SYNTHESIS

- Phase 1 + Shortcomings
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- Phase 4 + Shortcomings
- Toward a final design
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Introduction

In a world which is arguably dominated by science and technology, we have come to know more about the human body and its systems, yet we find many of our kind less happy and less healthy and with less innate understanding of our own health and welfare than ever before. First world citizens have come to expect modern medicine to be a panacea, where we the patient can call on an all encompassing system that will cure us of anything with minimal effort on our part, other than to pay. We seem to have forgotten that nature wants us to survive and thrive.

Natural hygienists have found answers, simply by looking back, searching religious practices and ancient medicine and observing animals in nature. This proposal seeks to allow that water fasting may be one of the paths to healing that heals body, mind and soul, and can be made available with education, to all who are willing and able.

"WATER FASTING IS THE MOST COST EFFECTIVE METHOD OF HEALING IN THE WORLD"
Dr Jason Fung MD Author

While the concept of water fasting has yet to gain mainstream acceptance, let me quote one of the fathers of Western medicine:

"EVERYONE HAS A DOCTOR IN HIM, WE JUST HAVE TO HELP HIM IN HIS WORK. THE NATURAL HEALING FORCE WITHIN EACH OF US IS THE GREATEST FORCE IN GETTING WELL. TO EAT WHEN YOU ARE SICK, IS TO FEED YOUR SICKNESS"
Hippocrates

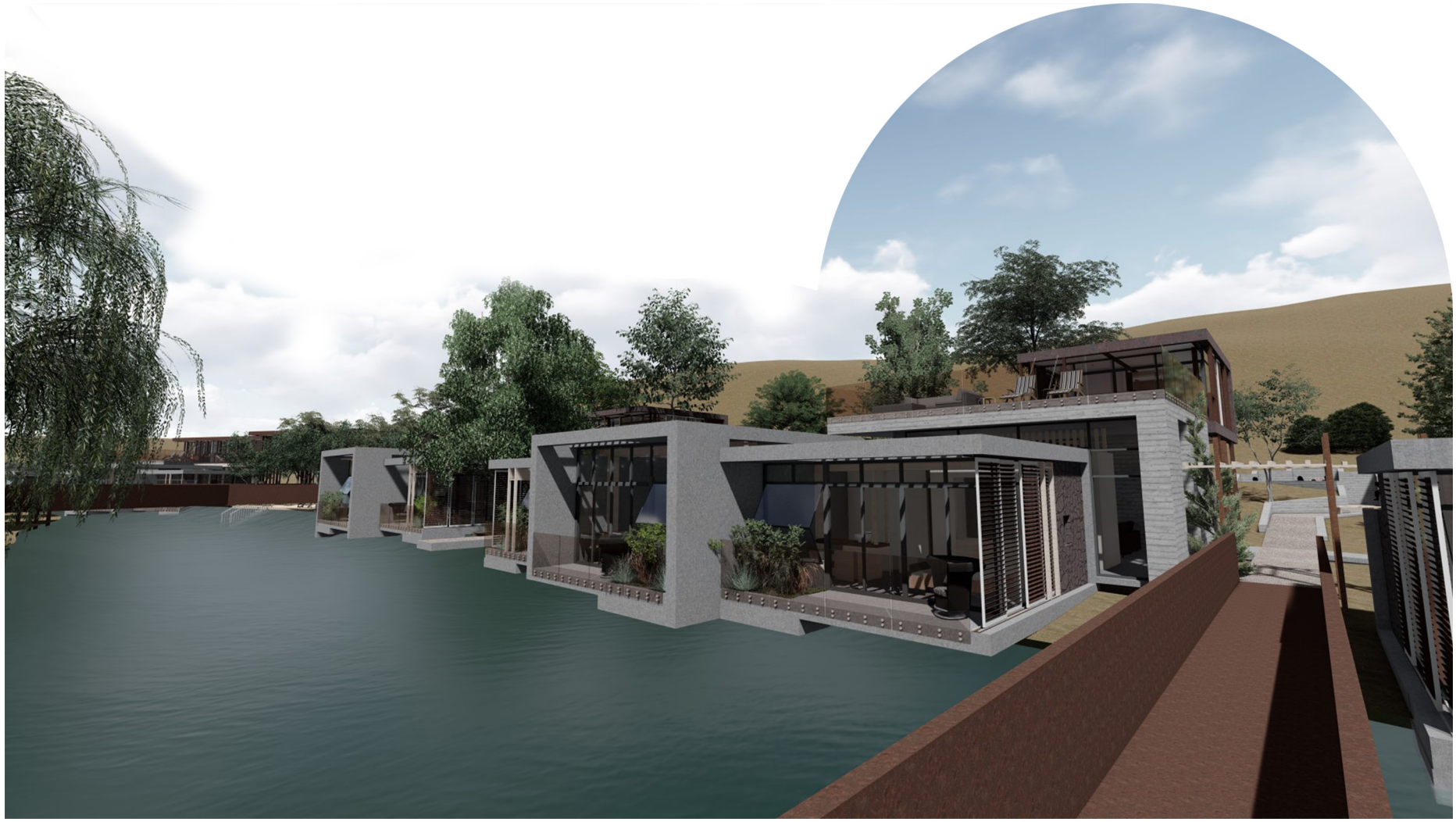


Figure 1 - *View of the proposal . (P. Vorster, 2019)*

Document Framework

This dissertation aims to investigate the possibilities of ritualizing the in-between moments of our lives in order to sustain health in our bodies, mind and soul. This exploration is through the design of a Water Fasting Centre which focuses on supporting and teaching us, using natural phenomena, both within our bodies and in nature itself, to encourage healing throughout one's life by using the moments of 'betwixt' as a pause for learning, reflection and healing in our busy modern lives.

The focus will be on the requirements of such a centre to be successful in terms of the social, medical and physical needs of users to gain insight into natural health and a sound mental state, through using the liminal stage between ill-health and health.

Part 1 – Situating the project in its rationale

+ Here the project rationale is investigated with a background to fasting and its relevance. A Touchstone highlights the essence of the design process, and provides a conceptual framework to focus the research needed for the design to remain true to the core requirements.

Part 2 – Challenges and aims

+ The design process is broken up into the four design principles of Typology, Topology, Morphology and Tectonics. Each principle is examined through the lens of the rationale in order to interpret general challenges and aims specific to the design. These aims and challenges converge to form a Research Question which will guide the following parts of the dissertation:

Part 3 – Exploration and grounding

+ This section of the Document explores the four design principles and their challenges via project specific research, and grounding it via literature reviews and precedent studies to formulate possible solutions to the identified challenges and aims set out in Part two. Here the lens is narrowed by the Research Question in order to produce project specific resolutions.

Part 4 – Technical Report

+ The technical report aims to quantify the project into real material and structural possibilities and solutions.

Part 5 – Design and Technical Synthesis

+ This section examines the design process which explores concepts influenced by the prior research which results in a final design proposal

Part 6 – Reflection and evaluation

+ The entire design and research process is evaluated with foregoing reflections on its successes and possible downfalls.

Research Methodology

The research focus for this exploratory study is focused around the four main principles of design in order to produce a final design which is applicable in its foreseen landscape for the client as well as for the proposed users and that its buildability is probable in both context and functionality. These four principles focus on the logic of the building type (typology), the site and context (topology), the form and its influencers (Morphology) and finally the logic of its construction (Tectonics).

DESIGN

TYPOLOGY

+ Character/type
+ Organization
+ Function
+ Needs

TOPOLOGY

+ The Site
+ Community
+ Context
+ Genius-Loci

MORPHOLOGY

+ Place-Making
+ Form Giving
+ (The Liminal)

TECTONICS

+ Technical Resolution
+ Materiality
+ Structure

These principles were investigated through specific sources of knowledge which aided in grounding the dissertation of the Water Fasting Centre in Bloemfontein Free Sate. Each source of investigation aims to aid in formulating a relevant and functional design.

A Touchstone which investigated revealing the true essence of the foregoing project and what the dissertation should aim to investigate.

3 Conceptual explorations which explored site possibilities along with conceptual underpinnings.

The conceptual underpinning was explored through a literature review gaining sources from precedent studies and academic reviews. This served as a concrete grounding for the project.

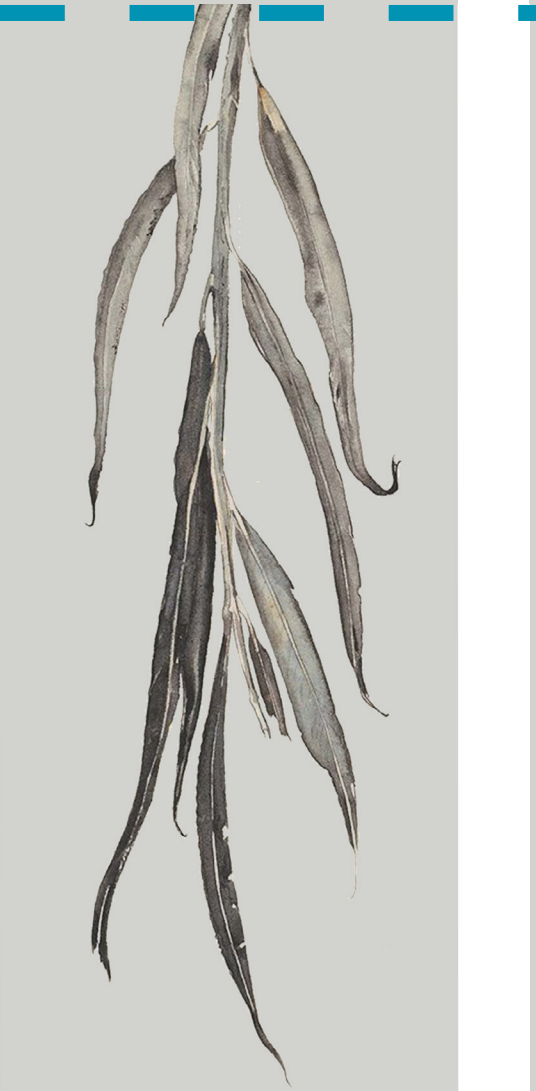
Precedent and case studies were investigated to understand working systems for, typology, topology, morphology and tectonics which could be applicable for the design

Interviews were conducted with an individual who has done a forty-day water fast 3 times and an environmental engineer who has worked closely with the proposed site.

A Site analysis was performed which delved into quantitative, cognitive and interpretative analysis. The quantitative analysis includes referenced sources of knowledge of the restrictions of the site. The cognitive analysis explored the existing experience of the existing site while the interpretive analysis explored the future possibilities.

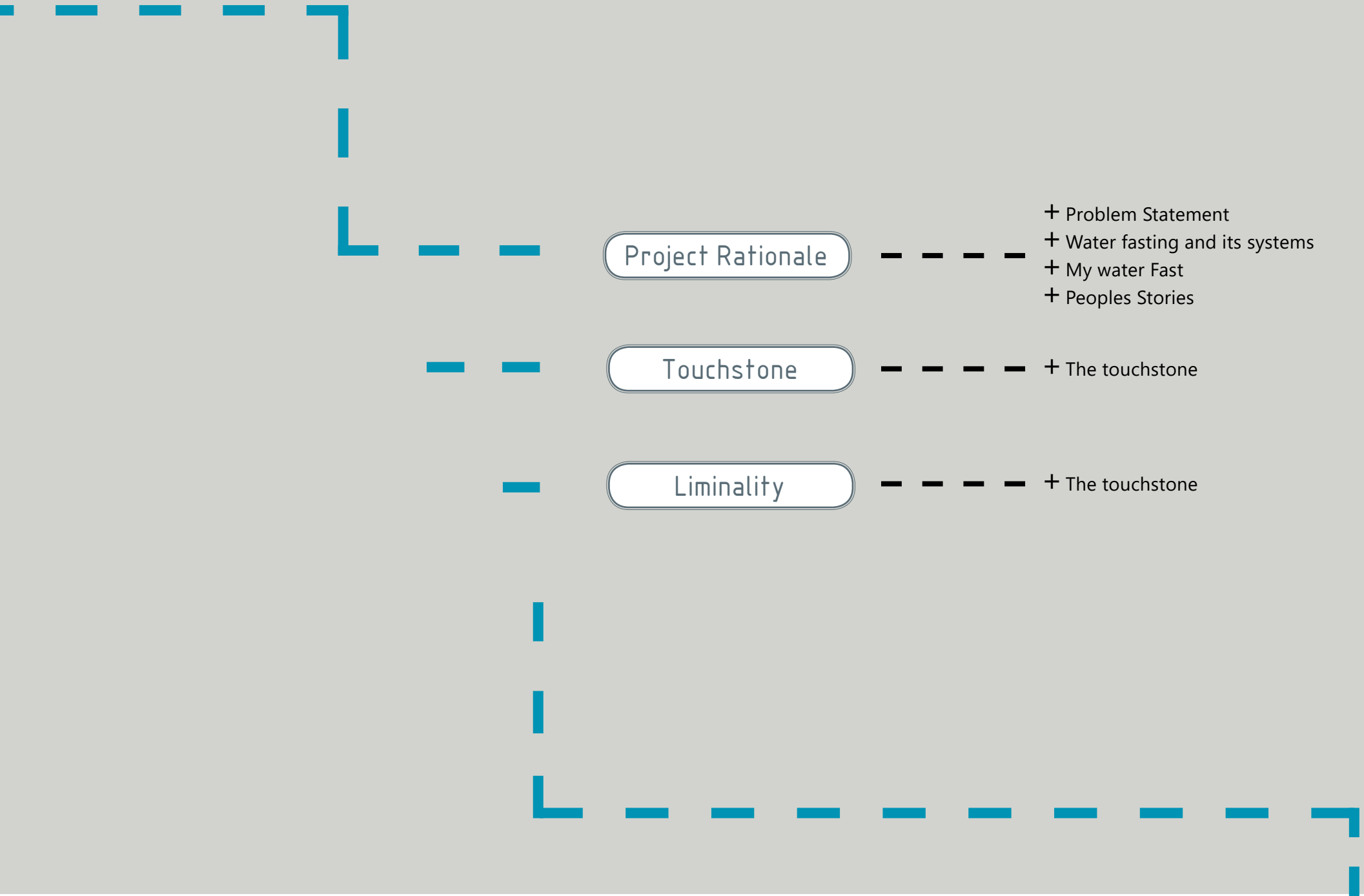
A literature review focused of theoretical underpinnings explored theories on how and why the architecture should transform into its morphological state.

PART 1



Situating the project and its rationale.

This chapter aims to underline the need for a Water Fasting Centre which proposes to use the in-between as a place of learning, healing and growth. This in-between follows through from connecting conventional Western medicine practices to natural remedies, using nature to bridge the gap between ill-health and health as well as finding a balance between tightly gridded urban construction and nature. In order for the reader to fully engage with the project, Fasting will be explored and researched to allow for further insight into the functional and scientific outcomes and needs of such a fast. Finally, a touchstone allows insight into the lens through which the dissertation is to focus.


Project Rationale
+ Problem Statement
+ Water fasting and its systems
+ My water Fast
+ Peoples Stories
Touchstone
+ The touchstone
Liminality
+ The touchstone

PROJECT RATIONALE

PROBLEM STATEMENT

Most of our greatest business decisions are a result of lengthy contemplation, and yet we don't pay the same respect to our bodies. We have become accustomed to believing in the science of medicine, and yet forget the root of it all, NATURE. We believe that a pill a day (chronic medication) for the rest of our lives is the only cure for terminal illnesses, but what if nature has the answers. What if the what ifs direct our healing techniques? Nature heals by a slow steady transformation from A to B and so should we. Our world is governed by decisions and liminal phases between. Our life is the liminal phase between life and death, we have become focused on the next, have forgotten to use the limbo as a tool. Water only fasting is a natural hygiene method of healing where a liminal phase becomes the healing tool itself. One learns to use the in between to gain a better understanding of our bodies and selves.

Our modern medicine has offered us the presumption that quick fixes are the best methods for curing ailments, but the quick fix comes at a cost. Quite literally the cost of the pharmaceutical drugs as well as the side effects which often end in more drug use to negate the side effects, which continues the downward spiral. Thus we have seen a rise in university hospitals and practitioners who are using integrative medicines as healing tools. These medical centers have delved into the past for healing tools such as nutrition, acupuncture and yoga to treat or prevent illnesses. This proves the interest and need for more medical centers and practitioners where traditional or historical methods of healing can be used in conjunction with modern medical science to improve or replace FDA-approved solutions such as pharmaceuticals (Longo & Panda, 2016). For example the use of Statins* to lower cholesterol and the risk of heart disease has become a prescription trend, where the FDA recomends prescriptions to individuals who may possibly have a risk within the next ten years, despite no symptoms (Paddock, 2018). Thus we see in Figure HFJ, in order for Statins to be effective for a single person within the high risk area, 24 patients will receive statins which may be harmful to their bodies, due to a steadily growing excess of cholesterol precursor which will in effect become more harmful (Longo & Panda, 2016). If a said patient was to instead attempt using historical dietary and traditional medicines, which have been used safely for hundreds of years past, and embraces positive lifestyle changes, costly chronic medication and its side effects can be avoided, whilst minimising the risk of heart disease. One historical method of healing is fasting.

Figure 1 - *Number of patients required to use Statins for a period of 10 years in order to prevent a single heart attack in each risk group. (Stitziel, N.O, 2015: Online)*

Natural hygienists (a group of medical practitioners who only heal through nature) have found the answers, by looking back, searching ancient religious practices and observing our fellow animals on earth. As dogs and cats refrain from eating when ill, and prefer to relax and let their natural systems heal them, so should we.
Water only fasting provides a safe, side effect free, healing tool for our mind body and soul. Water fasting is closely observed by medical practitioners and provides a perfect basis for Natural and Scientific healing to come together and better health effectively.

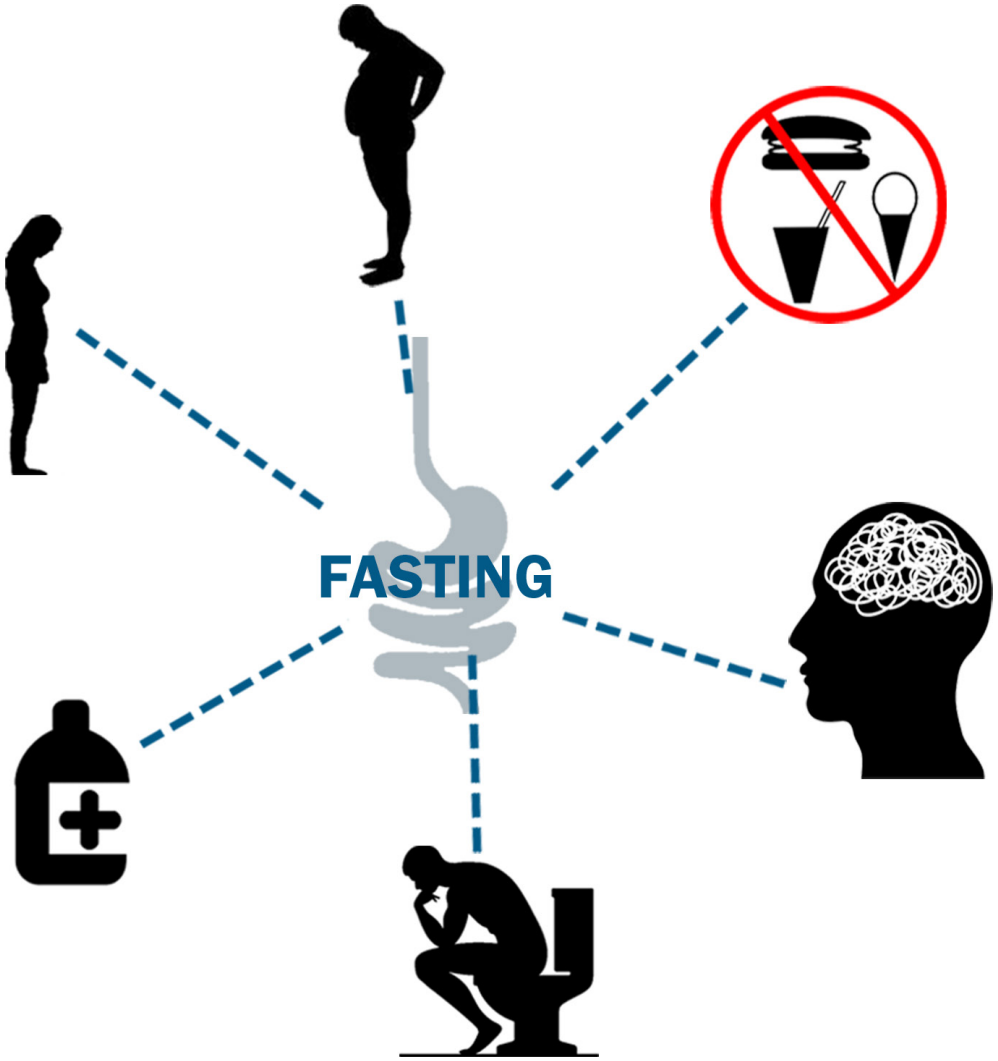


Figure 2 - *Fasting heals many common health infringements.*

AN OVERVIEW OF FASTING

Fasting is defined as abstinence from all or some foods for a prescribed time period. Despite fasting becoming increasingly popular, it has been a practice throughout history and is prevalent in the majority of religions where it is encouraged as a method of cleansing both the mind and the body (Natarajan & Kannan, 2014). Historically, religiousfasting was the norm. Ancient humans were not granted the luxury of three meals a day with unlimited snacks available at every corner shop, and were forced to hunt and gather food which did not equate to food three times a day every day. As humans we have abused the availability of food. Whilst we do usually eat only three meals a day, we have become a society which snacks almost uncontrollably, myself included. We have our large, way over portioned lunch, and by three o'clock indulge in a rusk or a chocolate. The snacking does not stop there. Because of the availability of light, humans have created an unpredictable circadian rhythm for ourselves. The natural cycle of light and dark, wake to rest, has been butchered and has reduced our rest and non-eating portions of the day significantly (Longo & Panda, 2016). Thus we see that humans no longer endure daily partial fasting, as it appears in nature, where food availability is determined by the circadian rhythm of day and night. These habits of overeating have forced our bodies to work harder and harder to process the large quantities of food in our gut, despite the added stress of overly processed, hormone filled and genetically modified foods.

In **HINDUISM** fasting is prescribed on all **EKADASI** days which refers to the 11th day of the lunar fortnight, i.e. twice a month.

40+ TIMES IN THE BIBLE

Fasting will loose the bands of wickedness, undo the heavy burdens & let the oppressed go free.

- Isaiah 58:6

MUSLIMS perform a 30 day fast for **RAMADHAN** each year.

In **BUDDHISM** fasting is practiced for self control by **MONKS** for 18-36 days in an attempt to be pure.

Fasting has many different approaches, with dynamic methods which can be easily incorporated into normal day-to-day lifestyles as well as more intense fasts which require more care and monitoring.

FASTING

Partial Fasting

\+

Abstaining from selective foods or drinks, such as sugars, processed foods, animal products or caffeine.

Calorie restriction

\+

Reducing calorie intake, intermittently or permanently, such as dieting.

Juice fasting

\+

Drinking only vegetable or fruit juice for prescribed time periods.

Intermittent fasting

\+

Restricted intake, in full or partially, for controlled periods, such as hours in a day, or days in a week.

Water Fasting

\+

Abstaining from all food and drink, except for water, for a set time period (from a single day up to 40 days).

The primary function for the design

Table showing centeral benifits of fasting which are backed by science.

Benefits of Fasting	Why?	Medical Journal (Scientific backing)
Promotes Blood Sugar Control	Reducing insulin resistance through obtaining a higher sensitivity to insulin due to fasting. Thus glucose can be efficiently transported to cells. Multiple studies show type 2 diabetes being controlled by fasting, without the use of pharmaceuticals.	• Arnason, Terra G et al. "Effects of intermittent fasting on health markers in those with type 2 diabetes: A pilot study." *World journal of diabetes,* vol. 8,4 (2017): 154-164. doi:10.4239/wjd.v8.i4.154 • Leonie K. Heilbronn, Anthony E. Civitarese et al. "Glucose Tolerance and Skeletal Muscle Gene Expression in Response to Alternate Day Fasting" *Obesity Research,* vol. 13, issue 3 (2005): 574-581. Doi:org/10.1038/oby.2005.61
Better Health by Fighting Inflammation	Chronic inflammation is involved in the development of conditions, such as cancer, heart disease and rheumatoid arthritis. Fasting decreases multiple inflammation markers to promote health, by reducing the load on immune processes. Fasting realigns hormone pathways for more effective metabolic control.	• Aksungar F. B, Topkaya A. E, Akyildiz M: "Interleukin-6, C-Reactive Protein and Biochemical Parameters during Prolonged Intermittent Fasting." *Ann Nutr Metab,* vol. 51(2007):88-95. doi: 10.1159/000100954 • E. Faris, Safia Kacimi et al. "Intermittent fasting during Ramadan attenuates proinflammatory cytokines and immune cells in healthy subjects" *Nutrition Research*, Vol 32, Issue 12(2012):947-955, doi.org/10.1016/j.nutres.2012.06.021.
Enhanced Heart Health	Heart disease is accountable for 31% of deaths and is considered the world leading cause of deaths. Fasting is especially helpful for heat health as it improves blood pressure, cholesterol and triglycerides by up to 30%.	• Horne, Benjamin D et al. "Usefulness of routine periodic fasting to lower risk of coronary artery disease in patients undergoing coronary angiography." *The American journal of cardiology* vol. 102,7 (2008): 814-819. doi:10.1016/j.amjcard.2008.05.021 • Beleslin B., Cirić J. et al. "The effects of three-week fasting diet on blood pressure, lipid profile and glucoregulation in extremely obese patients." *Srpski Arhiv Za Celokupno Lekarstvo*. Vol. 135 (2007): 440–446. doi:10.2298/SARH0708440B.
Improved Brain Health	Whilst this scientific research is currently limited to animals and cell tissue, it becomes apparent that fasting has the ability to regenerate and protect brain health. Improving nerve cell synthesis could provide protection, prevention and stabilization to neuro conditions such as Alzheimer's.	• Lee, J., Duan, W., Long, J.M. et al. "Dietary restriction increases the number of newly generated neural cells, and induces BDNF expression, in the dentate gyrus of rats" *J Mol Neurosci* 15 (2000): 99-108. doi.org/10.1385/JMN:15:2:99 • Tajes M., Gutierrez-Cuesta J., Folch J., et al. "Neuroprotective role of intermittent fasting in senescence-accelerated mice P8 (SAMP8)" *Experimental Gerontology*. 2010;45(9):702–710. doi:10.1016/j.exger.2010.04.010
Boosted metabolism and weight loss	Fasting boosts metabolism by affording the gut a chance to heal and efficiently cleanse itself naturally while improving healthy gut microbes. The higher metabolic rate and lower calorie intake provide efficient weight loss. Fasting proves more efficient in weight loss while retaining muscle tissue than calorie restriction.	• K. A. Varady, "Intermittent versus daily calorie restriction: which diet regimen is more effective for weight loss?" *International Association for the Study of Obesity*, vol. 12, 7 (2011): 593-601, doi.org/10.1111/j.1467-789X.2011.00873.x • Stephen D. Anton, Keelin Moehl et al. "Flipping the Metabolic Switch: Understanding and Applying the Health Benefits of Fasting" *The Obesity Society*, vol 26, 2 (2018). doi.org/10.1002/oby.22065
Increases in the Secretion of Growth Hormone	The Human Growth Hormone (HGH) is central to majority of our bodily functions by stimulating tissue growth. Studies prove that a single day of fasting increases HGH significantly, improving muscle strength, better bone health and metabolic rate.	• B. SalginabM, L. Marcovecchio et al. "The effect of prolonged fasting on levels of growth hormone-binding protein and free growth hormone" *Growth Hormone & IGF Research*, vol. 22, Issue 2 (2012), 76-81. doi.org/10.1016/j.ghir.2012.02.003 • M L Hartman, J D Veldhuis et al. "Augmented growth hormone (GH) secretory burst frequency and amplitude mediate enhanced GH secretion during a two-day fast in normal men" *The Journal of Clinical Endocrinology & Metabolism*, vol 74, 4, (1992): 757–765, doi.org/10.1210/jcem.74.4.1548337
Delay Aging and Extend Longevity	Presently these scientific studies are limited to animal studies. The results improve longevity by an astounding 83% in rats who fast with delayed signs of aging. The increase in HGH provides elasticity to the skin, reducing visible signs of aging.	• Hiroshi, Sogawa, Chiharu Kubo. "Influence of short-term repeated fasting on the longevity of female (NZB×NZW)F1 mice" *Mechanisms of Ageing and Development*, vol. 115, 2 (2000): 61-71, doi:org/10.1016/S0047-6374(00)00109-3 • Sakiko Honjoh, Takuya Yamamoto et al. "Signalling through RHEB-1 mediates intermittent fasting-induced longevity in C. elegans" Nature, volume 457, (2009) 726–730, Doi:10.1038/nature07583
Aid Cancer Prevention	Fasting has the ability to prevent cancerous tumor growth as much as chemotherapy, without the treacherous side effects. Recent studies have proved that combining fasting with chemotherapy increases the effectiveness of cancer reduction while retraining better health and curbing recurrence. Majority of studies are on cells and animals, but are beginning to emerge on human subjects.	• Lee, Changhan et al. "Fasting cycles retard growth of tumors and sensitize a range of cancer cell types to chemotherapy." Science translational medicine vol. 4,124 (2012): 124ra27. doi:10.1126/scitranslmed.3003293 • Dorff, Tanya B et al. "Safety and feasibility of fasting in combination with platinum-based chemotherapy." *BMC cancer* vol. 16 360. 10 Jun. 2016, doi:10.1186/s12885-016-2370-6 • Marinac, Catherine R et al. "Prolonged Nightly Fasting and Breast Cancer Prognosis." *JAMA oncology* vol. 2,8 (2016): 1049-55. doi:10.1001/jamaoncol.2016.0164

Table 3 - *Tabulated proven benefits of fasting and their effects with medical journals (limited to two per benefit) which scientifically prove the positive healing of fasting. (P. Vorster,: 2019)*

Fasting has an unlimited array of benefits which filter through the whole body, both physically and mentally. Fasting has the ability to prevent, reduce or eliminate illnesses without the cost of pricey pharmaceuticals and drugs with harmful side efects. Medical facilities have been working diligently to scientifically prove the positive results of fasting, as a standalone tool as well as in conjunction with modern medical methods, to encourage the trust in and use of fasting as a healing tool. Considering our society is governed by the science of effectiveness, these studies have increased the interest and use of fasting.

Water Only Fasting is the most extreme of the fasting approaches and requires close observation by trained practitioners for safe, effective health care.

For safety and health inducing benefits, water only fasting is a three fold process. A pre-fasting diet of approximately 2 days ensures smooth transition into fasting, this can be done at home. Similarly, a strict re-feeding diet follows a fast and is half the number of days fasted, usually conducted under the fasting practitioners. Thus if a fast is to last 5 days, 2 days of pre-fasting is needed and 2 days of re-feeding (5/2=2.5 days). Therefore there will be a total of 9 days dedicated to the fasting.

WATER FASTING AND ITS BENEFITS.

Prolonged fasting has multiple improvements on quality of life, specifically people who have certain diseases. Clinical research and investigation into water fasting has proved significant betterment and healing of hypertension, cardiovascular disease, fibromyalgia, osteoarthritis, metabolic syndrome, chronic pain and rheumatoid arthritis (Horne , et al., 2008). Fasting benefits can result in pharmaceutical free living, where fasting has been as effective as to cure or provide control to patients suffering with chronic illnesses or autoimmune diseases with the most significant results on rheumatoid arthritis (Li, et al., 2013).

The central benefit of extended water fasting is because of the process it induces in our bodies called autophagy. Autophagy is a natural process where the body breaks down and reuses cells in our body. Whilst this may sound daunting, it is the best form of a cellular detox, where damaged or dysfunctional cells are the ones being broken down and used to repair and create new cells which are healthy and active (Murrell, 2018). As we age autophagy declines, and cells are not repaired as they should be, this induces the signs of aging. Enduring an extended fast creates a fall in insulin and a rise in glucagon which stimulates autophagy. This metabolic change usually only occurs around the 18-20 hour mark of fasting with maximum benefits at about 72 hours of only water consumption as that is when liver glycogen lowers (Rosenfeld, 2019).

Apart from Autophagy, fasting creates a hormonal change where glucose changes from being the primary body fuel (carried by insulin) to using ketones. Ketosis is a state where the body breaks down stored fats into ketones which become the fuel for the body, whilst using bodily stored fats, i.e. loosing fat. The brain becomes more clear and effective as ketones are a pure source of energy for the brain, this induces the brain clarity expected in the fast (Longo & Mattson, 2014). This clarity often affords the person a sense of enlightenment where spirituality in the self is achieved. Having peace of the mind offers mental and spiritual cleansing. Thus we see the essence of the soul being detoxed and rejuvenated.

All food from the final meal has been used, insulin levels begin to drop and hunger takes its toll. Withdrawals from sugar and coffee can become apparent as the body's metabolism switches to ketosis. Headaches and fatigue are possible. Often the ketogenic switch begins to disrupt sleep patterns.

Majority of the glucose from the final meal has been used by the body. Hunger begins.

Glucose from the final meal is being used as per usual.

Over the worst

Ketosis is rising and Autophagy is replacing cells while healing the body of ailments. Healing crises arise. Mindfulness and clarity become apparent. Fatigue may come in waves, followed by intense energy. The body struggles to regulate temperature and sleep becomes more disrupted.

Ketosis is the primary energy source. The mind and soul are rejuvenated and the body mends. Close observation and reflection signals the end of the fast.

	Phase I 0 - 4 hours	Phase II 4 - 16 hours	Phase III 16 - 32 hours	Phase IV 32 hrs - 24 days	Phase V 24 days and on
Origin of blood glucose	Exogenous	Glycogen, hepatic GNG	Hepatic GNG, glycogen	Hepatic and renal GNG	Hepatic and renal GNG
Tissues using glucose	All	All except liver. Muscle and adipose tissue of diminished rate.	All except liver. Muscle and fat tissue at rates intermediary betw. II and IV	Brain, red blood cells, renal medulla. Small amount by muscle	Brain at diminished rate, red blood cells, renal medulla
Major brain fuel	Glucose	Glucose	Glucose	Glucose, ketones	Ketones, glucose

Figure 4 - *The five metabolic changes during a extended water fast (Cristi, 2016: online)*

Enduring hormonal and metabolic changes in your body does affect the experience of the fast. Typically, the first two days, and even the third for some, are the hardest to overcome. Here the mind must be strong to overcome the urge to eat, this is where a supported retreat would be of great benefit, where food is not as easily available, After the three-day mark, ketosis is in full swing and the body uses itself for fuel, here the mind begins to obsess over food, and not the body (Grundler, 2019). Learning the control of your mind over your body, and the power one holds to resist food has a significant effect on mental wellbeing and strength post fasting.

Whist the body goes through the intense detox and healing process, we find the occurence of healing crises. Healing crises occur when a low-lying chronic disorder or a past injury, such as a damaged knee, are brought to the surface once and for all. Because of the lowered inflammation and the high autophagy, the body rediscovers ailments which have been pushed to the side and have never been fully healed (Gustafson, 2014).

MY FAST

Fasting??

Part of my research ended up being personal. I, as have most of us, had been taught by medical practitioners, dietitians, school workshops and our grandmothers that a full meal should be eaten three times a day, and teatime with rusks is a must. Even considering skipping a meal led to the presumption that anorexia had struck. Being at an all-girls boarding school for most of my school career had taught me the devastating effects of meal missing on teenage girls. I had lived in a boarding house where 80% of my year group had been anorexic or bulimic and a really close friend had been admitted for extreme anorexia. I grew to fear food and its absence. Was I, or was I not hungry for a meal? Trying to prove the new fasting craze as false and unhealthy led to the development of this dissertation, and a journey towards understanding our bodies and their need for food which has given great peace to my soul. Proving granny wrong had been a lot easier than I thought it would be.

I had been struggling with hormonal imbalances and low immunity – constantly unwell, so I had good reason to fast and de-tox. My fast was not aimed at losing weight (that was a bonus) but was the extreme detox I so desperately needed, of both my mind and body. I decided after much research that a five day fast would be the right way to go.

Table 5 - *Table of key vitals, before, during and post fast. (P. Vorster: 2019)*

DAY	0		1	2	3	4		2	1
WEIGHT	65.5kg	PRE-FEED ± 1 DAY	65.5kg	64.7kg	62.8kg	62kg	RE-FEED 0.5XDAYS FASTED	61.9kg	60kg
BLOOD PRESSURE	125/76		126/77	126/94 114/69	122/78 132/82	118/78 127/75		121/77	124/75
1-10 RATING	8		6	4	9	10		9	10

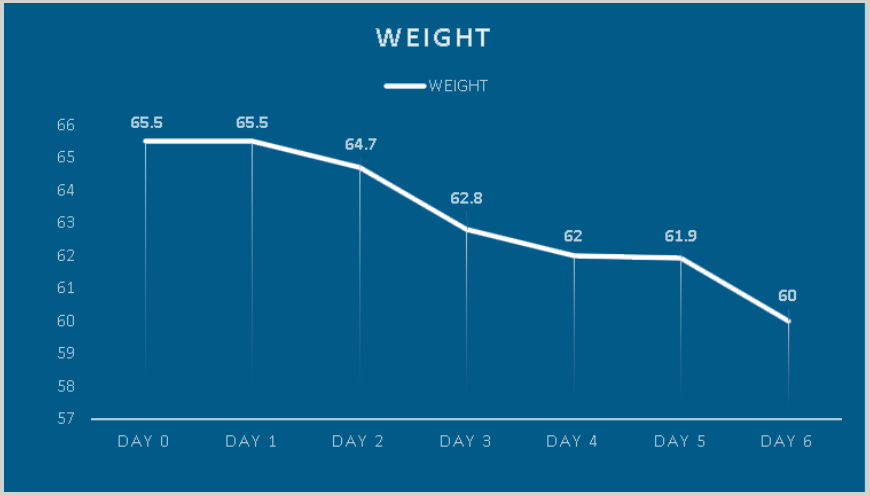


Figure 6 - *Graph showing weight loss over fasting period. Total weight loss of 5.5kg. 3.9kgs regained one month post fast. (P. Vorster: 2019)*

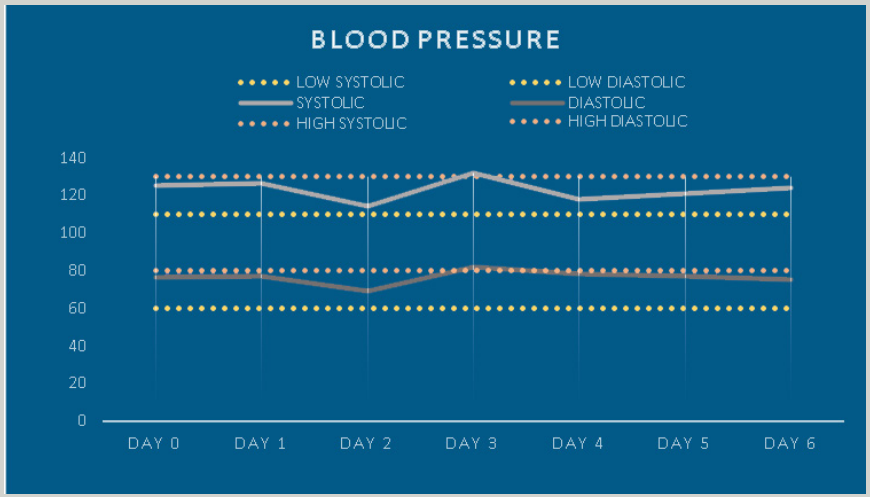


Figure 7 - *Graph showing blood pressure over fasting period with high and low controls for diastolic and systolic. Overall blood pressure change is insignificant. (P. Vorster: 2019)*

Reflection:

Post Fast, I found my mind clearer than it had been in months. Tasks that had been pushed to the side seemed simple to accomplish. A full spring clean of my home life found me starting a new semester with a clearer mind and happier soul. While it sounds a bit silly, the space that food had taken up in my daily thoughts was replaced with thoughts of solutions that seemed doable and there was no problem that could not be solved. Feelings of calm awareness truly gave me the opportunity to embrace life post fast. I have not had as much as a cold since.

Will I be doing it again? Without a doubt, but hopefully in a more relaxed environment which encourages growth in mind and soul. Planned fasting has become a very real health tool in my medicine chest.

DIARY OF THE FAST

Day 0: Pre-Fast:

The pre-fasting seemed the easiest of the tasks ahead, eating simple vegetables and fruit which are easily ingested. But it was not. I drove the four hours from Bloemfontein to my home-town, Elliot, en-route snacks are an essential. I diligently packed a small tub of fresh fruit bits thinking this would be ample to keep me satisfied. I was wrong. At the first of the 3 Stop-Goes I had finished my fruit, and water just didn't seem to be cutting the hunger. I was not really hungry I suppose, but the mind plays tricks on you. The nearest Engen found me buying a large packet of Big Korn Bites whose lifespan was very short lived. Arriving in Elliot, I met up with my family friend, Ashley, who would be my partner throughout the fast.
In anticipation of my eagerly awaited arrival, my mom had made my favorite tiramisu cake, despite her understanding of our pre fasting requirements. So being the good daughter I am, I had a slice of the most decadent cake you could imagine as my final meal in the evening. Zero regrets.

Day 1 – The rejection:

The morning seemed simple enough for me, as I had been practicing Intermittent fasting for about 6 months prior the fast. Some friends came to visit and we drank a cup of black coffee and spent the day in the sun, soaking up vitamin D (Essential in the healing and detoxing process of fasting). We drank flavored teas throughout the day, keeping our fluid intake well up there.
Afternoon came and again, my mother decided to make my favorite tiramisu cake for a family braai organized by my father. My parents were not in our good books.
This is where the struggle began. The smell of the cake being made was pure torture, knowing I could not lick the bowl was even worse. As the family arrived (all 11 of them), I was simply instructed to make a salad. Now this may not seem so daunting, but not being able to eat a rogue tomato or lick the fetta off your fingers was almost too much for me to handle. Luckily Ashley jumped in to save the salad.
All in all, the day was not as bad as assumed, the most challenging part was declining the snacks at the braai and replacing a beer with a glass of water to watch the sunset. Sleeping proved as simple as always.

Day 2 – The bad day:

We woke up late, and again the morning didn't seem so bad, hunger was not at the fore front of my problems, but the fact that my father had organized yet another braai was. Ashley and I decided to cut our losses and spend the day at her farmhouse, where the bad started.
Going from an average of 6 cups of coffee a day to one cup of black coffee and weak herb tea had provoked a blinding withdrawal head-ache. All the research had said this would be the worst day, but I had not expected it to be this bad. I was struggling to keep my mind from obsessing over the freshly made farm style lunch and focus on the goal. I was hangry (an onset of unwarranted anger due to hunger) only one thing to do, go and sleep.
In the afternoon we walked around the massive park-like garden and appreciated nature, closely followed by some yoga in the sunroom. The yoga and exercise seemed more helpful than the nap. Simply focusing on breathing, the body and nature helped achieve mind over matter. Whilst doing exercise on an empty stomach seems uninviting, we found ourselves relishing the movement.
After a soak in the bath, we hit the hay. Sleep did not seem as simple as before, one of the effects of fasting.

Figure 8 - *Pausing at the dam to appreciate nature. (A. Farrington, 2019: online)*

Day 3 – A pretty good day:

Waking up feeling refreshed, we did another hour of yoga in the sunroom whilst the house was engulfed by the aroma of a good farm breakfast. I found myself appreciating the smell and was not consumed by it. The uncontrollable obsession with food had subsided and thoughts roamed parts of the brain which are usually neglected. Here I decided to continue the rest of my fast on water only. Drinking teas and coffee seemed a cheat in my newly heightened relationship with food.
Moving back home, the day seemed to fly by. A cold front had settled dusty snow on the mountain tops and had created a cold nip in the air. We started the warm fire in the sitting room and settled down for a day of Wimbledon and card games.
As the evening rolled in, I found the urge for mental stimulation growing, and beating Ashley at Rumi simply wasn't cutting it. I opened my laptop and began constructing a refeeding program, but it did not stop there. Now understand that I have extreme ADHD and focusing in an environment where there is a TV blaring amongst a mosaic of conversation is close to an impossible task, I had managed to read and summarize two articles within an hour. I had read about the claim that one receives a heightened sense of concentration when ketosis is achieved but had assumed it to be a myth.
The evening ended with a night of tossing and turning for both of us.

Day 4 – The last day:

I awoke feeling fresh and chipper, despite the sleep struggle, but Ashley did not share the same sentiments. Her Blood pressure had dropped significantly, and she was feeling a bit lightheaded. She had a cup of black coffee and within an hour was back to normal.
We had hoped to fast for a full 5 days, as this is said to have the maximum benefit for the shortest period, but with the worry of Ashley's hypotension we decided to make day 4 the last of our foodless days and make the most of the final leg. Here we began to understand the need for medical assistance and the importance of understanding one's body and its needs. We went for a three kilometer walk down to the dam where we did some breathing exercises and meditated. Towards the middle of the afternoon, I realized I had more energy after 4 days of not eating than I had had in a while. The other realization, which is relatively PG, is that after 88 hours of not consuming food, I still had bowel movements. Apologies for speaking out of the bathroom, but we presume food flushes through our system with ease, but performing a true detox such as a fast, allows the gut to fully spring clean and start anew.
The evening found us hashing out the smoothie to be our first meal. We had spent a good portion of the afternoon discussion the ingredients and how we could delight our taste buds without cooked or processed foods nor too much fruit. We believed we had the perfect recipe, from avocado, celery, blueberries to fresh herbs from the garden and more. The smoothie was a flop. All the different taste sensations had mixed to produce a green sludge which sent shivers down my spine, and not in the positive sense. Take two, with simple flavors proved more successful. Our first meal, a green smoothie with raspberries atop, was delightful.

Figure 9 - *The first whole meal we ate in the evening of day 1 re-feeding. (P. Vorster: 2019)*

Refeeding – The true test:

The days following the fast were almost tougher than the fast. Refeeding is an important part of fasting. Finding healthy foods in our modern supermarkets do not come cheap and resisting the processed foods readily available was even tougher. The two days of refeeding involved simple meals, unprocessed foods free of added salts, sugars and oils with no meats or dairy – basically vegan.

OTHER PEOPLES STORIES

Misha Yurchenko

5–day water fast age

I haven't eaten in three days and just went for a two-hour hike in the mountains followed by a swim in a waterfall.
No, I haven't been kidnapped and I'm not lost in the jungle.
All of this by choice.
I'm on day three of my five-day fast, where I only drink water with a pinch of pink Himalayan sea salt, and juice from a few limes.
I've done five-day fasts several times, but for whatever reason this time seems to be the best (for me), meaning that I feel pretty good. The biggest difference compared to previous fasts has been my subtraction of any coffee or tea – now it's just water.
(Yurchenko, 2018)

Tony and Veronika

Age 42 & 66

Dear Dr Karalis,
My Mother and I were referred to you by a good Friend.
Initially, we had mixed feelings as to what to expect but, the results we witnessed spoke for themselves.
My Mother is sixty-six years old and has suffered with Constipation for over 20 years, high blood pressure that ensured chronic medication for twelve years and severe Arthritis. However, after she completed the program / fast, she feels and lives like a different person. My Mother is no longer constipated, her blood pressure seems to have stabilized and her Arthritis is now a thing of the past, enabling her to walk approximately five Kilometers every day. In addition, her eyesight has improved substantially and she has never felt better.
I am forty-two years old and was diagnosed with an "overactive Thyroid" and three growths attached to the Thyroid. Upon completing my treatment, I am happy to say that my Doctor has given me the "all clear" and I have a healthy Thyroid count, with no sign of any growths.
This has been a truly life changing experience for the two of us, both physically and emotionally and it is remarkable to discover that fasting can achieve so much more than just wellbeing. It opens you up to discover your true self-worth, grants you confidence, positive and an energetic attitude towards life and lets you see what your purpose is and what you stand for as a Person. This has been our greatest achievement through your program.
I am honored to say that "if you have not fasted, you have not lived". Only a handful of People worldwide have had the chance to fast and my Mother and I are blessed to be amongst the lucky ones...
(Veronika, n.d.)

Karin Nielsen

22–day water fast age 30

I embarked on this journey believing that the only positive side effects would be weight loss + money raised for charity. I was wrong!

Extended fasting is ultimately a test of determination, will power and grit. Completing such a tough personal challenge did not only improve my physical well-being but also boosted my self-belief and fine tuned my self-awareness.

I now believe that the '3 meals per day' lifestyle we have all become used to is nothing more than a social construct. Our hunter gatherer forefathers did not have the luxury of cornflakes on waking followed by a Boots meal deal at lunch and deliveroo for dinner. I no longer think we 'need' this either.

6 months on from breaking my fast, I have managed to maintain my post-fast weight (with the exception of a small amount of water gain). I fast intermittently each day (no food between 9pm and noon the following day) which helps me achieve razor sharp focus on difficult tasks first thing in the morning. I try to avoid refined carbohydrates and sugar in favour of complex carbs, healthy fats and proteins.

Above all, I trust my body to let me know when it's time to eat.

(Nielsen, 2018)

Jose Alfredo Kawage:

20–day water fast

I fasted for twenty days, and this is my experience. First day was rather easy, as in used to skip breakfast, and sometimes lunch. Second and third day were a bit difficult, and cravings start to pop in my head, food and eating invade your thoughts. For the fourth day, I was in a "wow, I'm doing this, and I think that's when ketosis kicks in, and suddenly hunger goes away, I started feeling little dizzy and light headed, but generally speaking, I felt very well, despite the fact of not eating anything for 100 hours.

Days from five to thirteen were easy, and what I did to satisfy my cravings, was to cook them for my kids, BLT? Cook them a BLT, chorizo bread and cheese, the some, also for my weekend BBQ, I still did them, but "eat" water, while my friends enjoyed the meat and beer.

What the water fasting really does to your body and mind is amazing, I got my cholesterol levels from dangerously high (over 400) down to 140. My triglycerides from a whopping 1300 to 130. Also prongs now are reasonable, completely changed my point of view for snacks, sodas, chips, and other junk food.

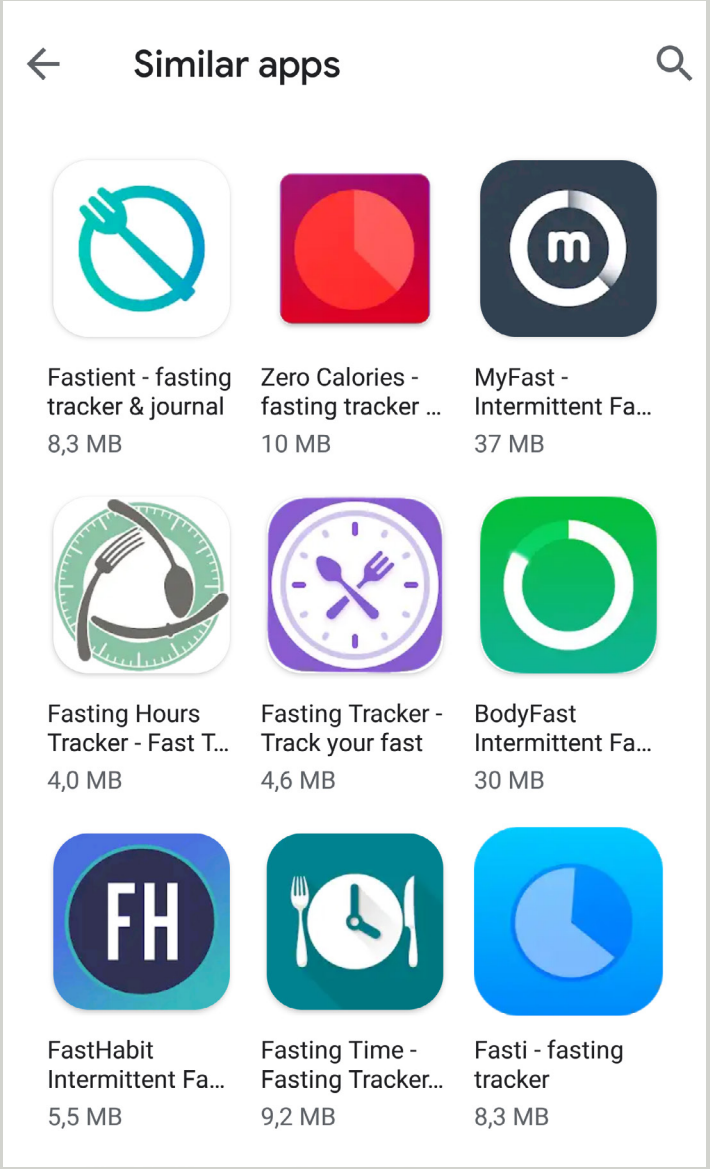
I think I'll do another fast pretty soon.

(Kawage, 2017)

FASTING ON INTERNET PLATFORMS

There is a ground swell change in the way that popular opinion views Fasting, Intermittent Fasting and Water Fasting, as is evidenced by the numerous and ubiquitous number of apps available. However, as easy as it is made to appear, there is a need for guidance and support, especially at the start of the journey, as was evidenced by my own attempt.

There is a growing market for the education and support that makes the fasting journey so effective.



Fasting is gaining popularity on social media space, but fasting should not be taken lightly, and we have lost the generational knowledge that enabled us to safely fast. There will be a growing need in the future for education on safe and effective fasting.

Plato, Paracelsus and Hippocrates would have agreed with Will Smith.

THE TOUCHSTONE

The touchstone was created to highlight a way of thinking which will develop the initial 'lens' through which the dissertation will be designed, highlighting the essence and core function of the design.
The touchstone was originated around the understanding that a fast is the absence of all things, except for water. Water becomes the link through the past, present and future. Water is essentially the lifeblood of the project and can be considered to be the main focus in terms of the building.

Figure 10 - *Preliminarysketches of the touchstone. LEFT: a simple 3 part box to retain water. RIGHT: introduction of water as a guiding principle of fluid movement.*

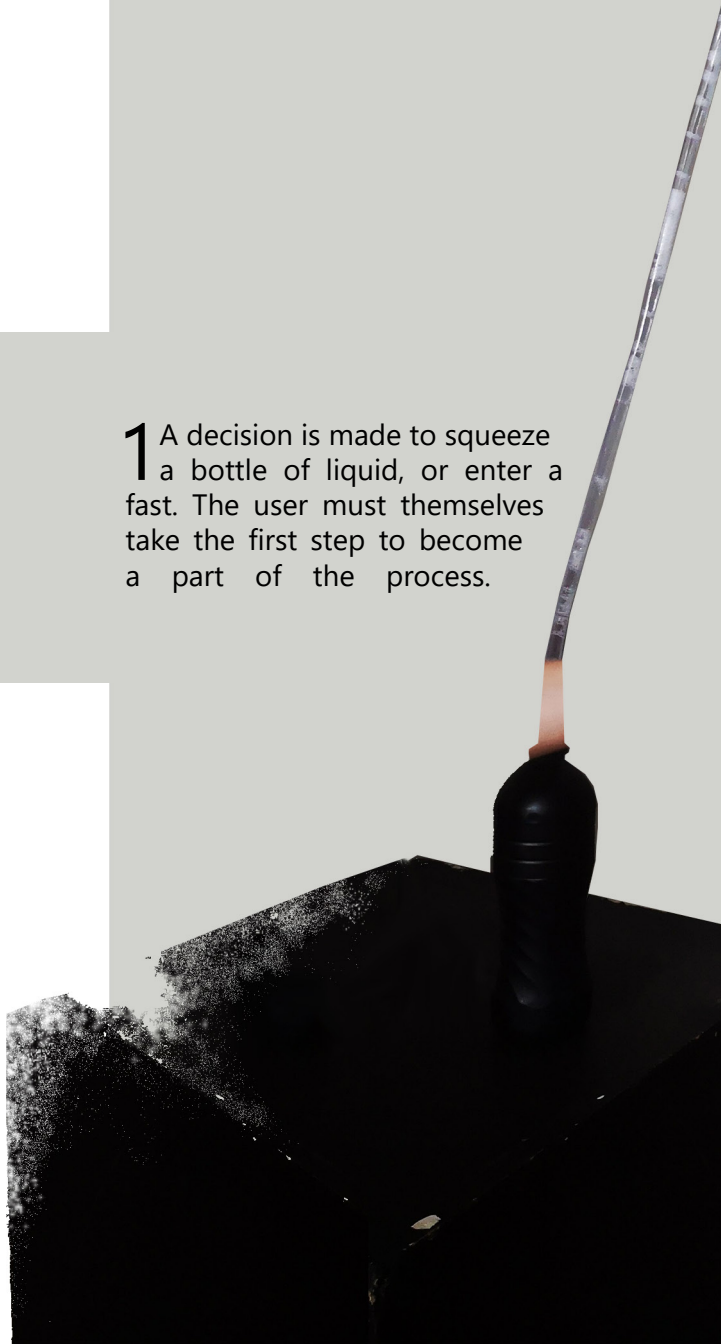
The touchstone is inherently in 3 parts

The first, a porous block of concrete which mimics our bodies before a fast. The body is solid yet impure, filled with man-made items which inhibit our ability to self-heal and retain 'water'(life).

The second is an elongated transparent box, revealing the exposure of the liminal phase of the fast. When fasting you are in-between eating as well as in-between beings of self. Here exposure is prevalent as one opens oneself to change and reveals elements of who you are in order to heal.

The third part is a timber box. The timber represents a human form who is closer to nature and is pure in form and being.

1 A decision is made to squeeze a bottle of liquid, or enter a fast. The user must themselves take the first step to become a part of the process.



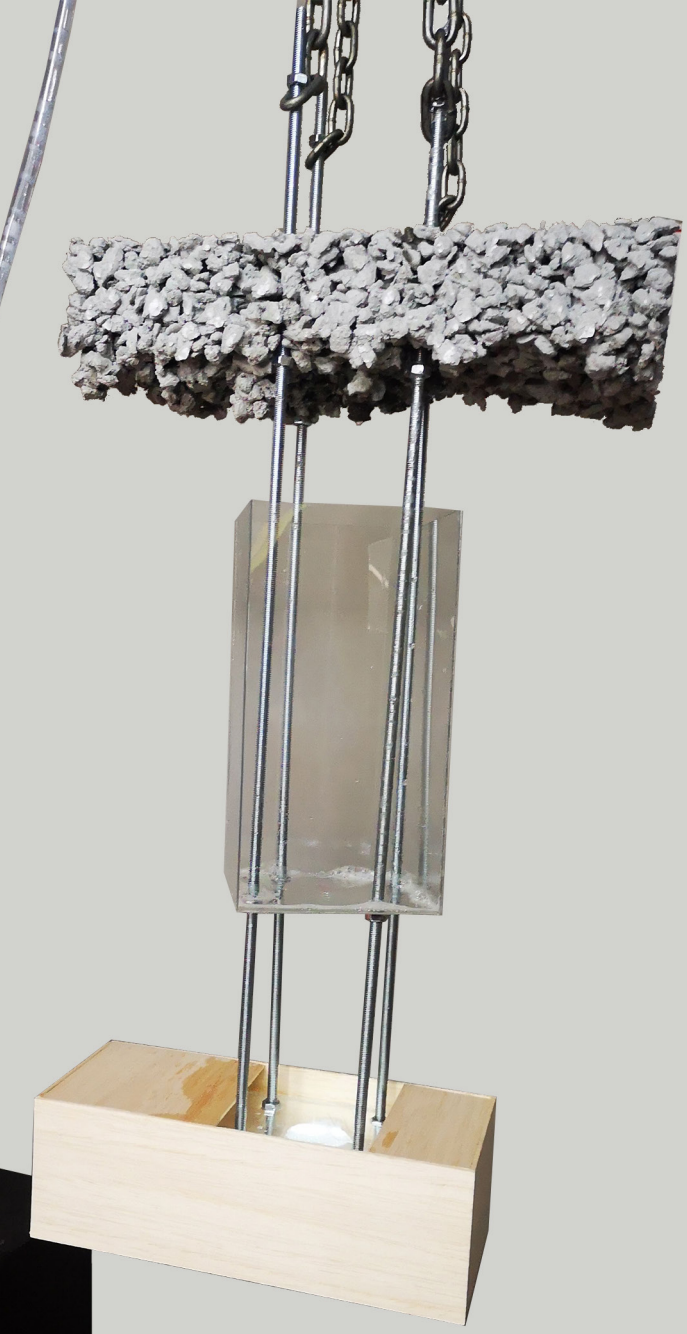


Figure 11 - *The Touchstone as it hung amidst the nothing, waiting to be used.*

2 The water falls through the imperfect concrete block of impure life.

3 The uncontrollable dripping is captured by the transparent box of fasting.

4 Here the transparent fast captures the liquid knowledge and formulates a slow controlled drip towards the new natural body. The control represents both the personal control one gains through ritualizing the liminal, as well as the supervision of the fast by medical practitioners.

5 Once the controlled drip enters the new body of timber, an electrical circuit is formulated to illuminate the touchstone.

6 The light shines from the new bodily form, due to the presence of the controlled water, which allows an illumination of the fast/liminal with a reflection upon ones past self. The light reveals the past self, but can never surpass the concrete mass, showing the perspective a liminal phase can create, without being able to de-evolve back to ones past self.

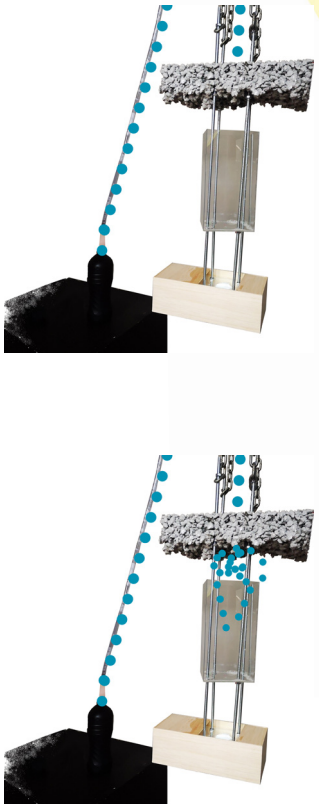


Figure 12 - *Step by step process to enlightenment (Figure 12)*

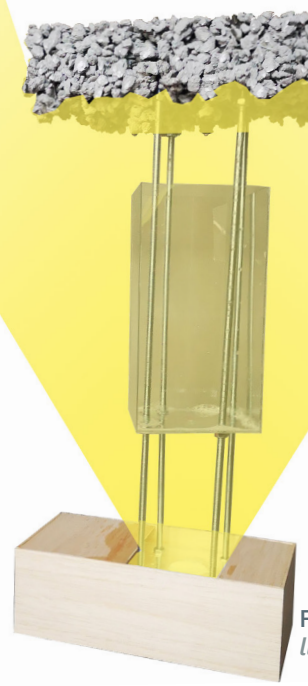


Figure 13 - *Enlightenment.*

The touchstone reveals the need for a ritualized and controlled liminal phase which illuminates the past without nostalgia. This encourages a closeness to nature as well as our own selves.

LIMINALITY THROUGH THE SOCIAL LENS

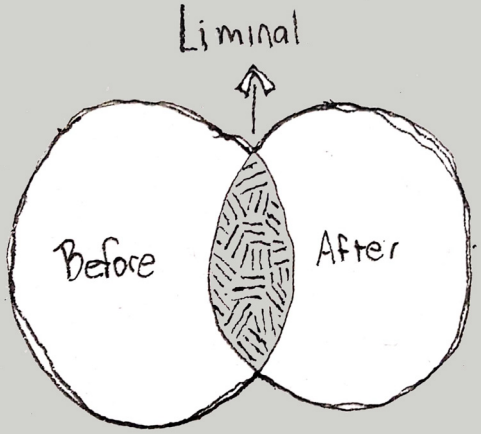
The MAN problem

Humans are at the highest understanding of our bodies to date. Science has captured and tabulated our human bodily characteristics and responses through deductive methods of ones and zeros. Thus, we would think, having the science of how our bodily machines work, our generation would be healthier, yet we find ourselves more depressed and ill, despite our extended life expectancy (Cooper, et al., 2017). In retrospect we look for people to blame, our jobs, the doctor or pharmaceutical companies, but in fact it is oneself. We have become disconnected from ourselves, from nature, such that we have no idea of the strength that lies in our natural state of being.

Nature has the ability to heal, both itself and the natural human body, yet our modern world has let the knowledge of these possibilities fall by the wayside. This could be because we are no longer taught about natural healing remedies, but are force fed knowledge by pharmaceutical companies who aim to make a dime every time you have a headache - drinking water to relieve a headache, the natural way, does not pay. With this being said, modern medicine has a definite role in our health, nature cannot perform blood transfusions.

Could an in-between not be possible?

Could the in-between be the anwer to our current conventional 'treat the disease' and the 'alternative treat for health?'



The NOW problem

Considering the in-between in our modern society seems uncanny. The internet has given us the ability to find answers within seconds, and actually searching through a library and deducting information to come to our own answers seems to be a thing of the past. Our problems are 'solved' by one trip to the doctor or one google result that searching the in-between, from uncertainty to understanding, has become lost. This has impacted the way our generation reacts to knowledge, such as news, where we believe the first information delivered without questioning or researching it further.

As a society, we could benefit from ritualizing the in-between, or the liminal phase, not only for our thoughts but for our health and our approach to nature.

Embarking on a liminal journey which aims to ritualize the in-between, through a water only fast could create an opportunity for both architecture and humans to appropriate the uncertainty of the in-between, into a space of growth and discovery.

Lexicon:

Health

Both physical and mental well-being

Nature

Fauna, Flora, water and our bodies

Liminality

The in-between

Liminoid

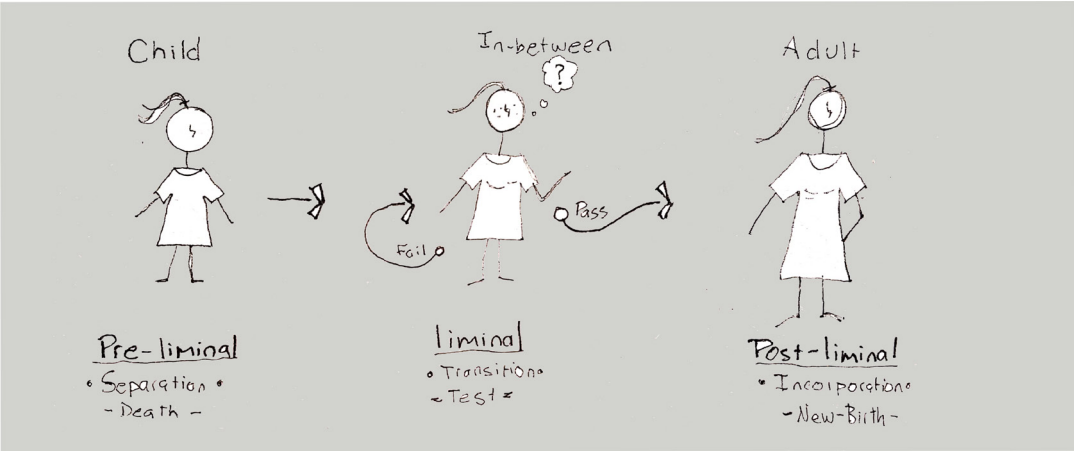
A break from norms and structures

Comunitas

A group of beings in the liminal state

Arnold Van Gennep

Liminality is most simply defined as the state of being in-between or betwixt. The theory of the 'Liminal state' was introduced by Arnold Van Gennep in 1909 through his book 'Les Rites de Passage' (The Rites of Passage), where he likened social rituals of rites of passage to liminality, as the rite of passage changes the status of the individual within the society. He defines the liminal state as being in-between situations and conditions where established structures are disordered, such as hierarchical reversal, causing an uncertainty in continuity of tradition and future outcomes (Horvath, 2009; pp 3-4). Such rituals can be giving birth, hunting, marriage and puberty. Gennep describes the differentiation between the two worlds as profane (secular) and sacred (religious), stating that these are the transition points which are constantly being overlapped. This covering causes the grey area in-between the two states which must be passed in order to shift from one to the next (Gennep, 1960; p 1).



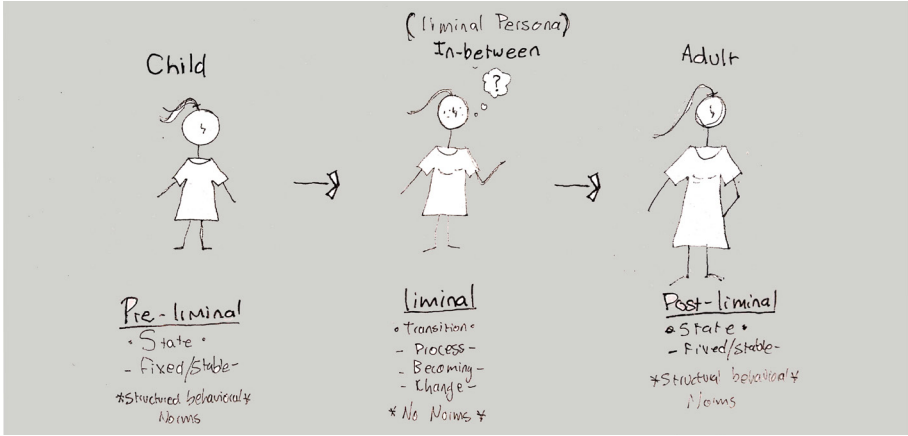
Thus, emerges the three-fold structure of liminality: Pre-liminal rites, Liminal rites and Post-liminal rites (Thomassen, 2006; p. 322). Using puberty as an example we can understand Genneps' observations and assumptions of the three liminal rites. Pre-liminal children require a metaphorical 'death' of the present and past, leaving something behind and looking toward the future, marking the demise of her childlike self. Liminal rites are that of the official passing of between where norms and rules of the previous self no longer apply, nor the ambiguous forums of the future. Here the pubescent girl has no stronghold to the norms of a child, and has no place in the adult world as yet, and is forced to create new rituals and norms for herself which will be applied in the future. Once the near adult has formulated a new identity and is confident in the forms, she is incorporated into the new world through the post-liminal rites and is perceived to be a woman (Gennep, 1960; p. 21).

Therefore, a conclusion can be drawn that the liminality provides a platform on which progressive change can be made, drawing the foundations of a post-liminal rite, which is built on personal in-between ritual. By ritualizing the liminal, humans are afforded the ability to endure the transitional and build the new-birth on personal acceptance, rather than avoiding the liminal and skipping from being a 12 year old little girl to a 13 year old woman in the adult world.

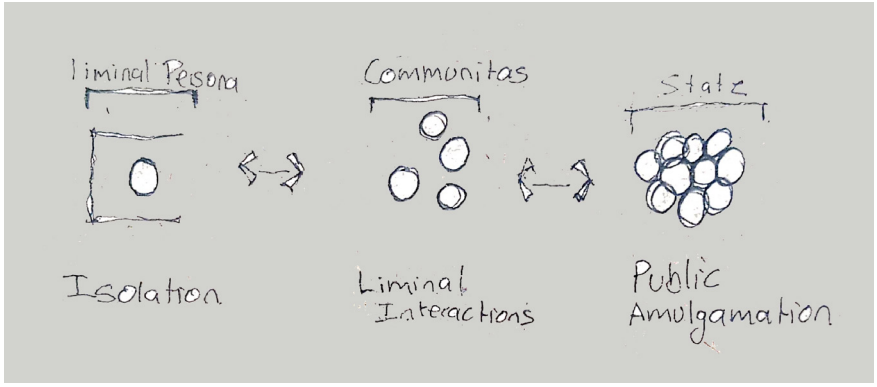
Victor Turner

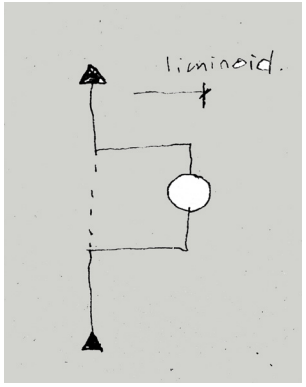
Victor Turner concurred with Genneps findings in the essay titled 'Betwixt and Between: The Liminal Period in Rites de Passage' in his book 'The Forest of Symbols', 1967. Here he argues the need for focus on the liminal, as the importance of the in-between, but more truly the effects that the liminal has on humans. The reactions and emotions which develop from the state of transformation and how that shapes them (Turner, 1967; pp. 4-5).

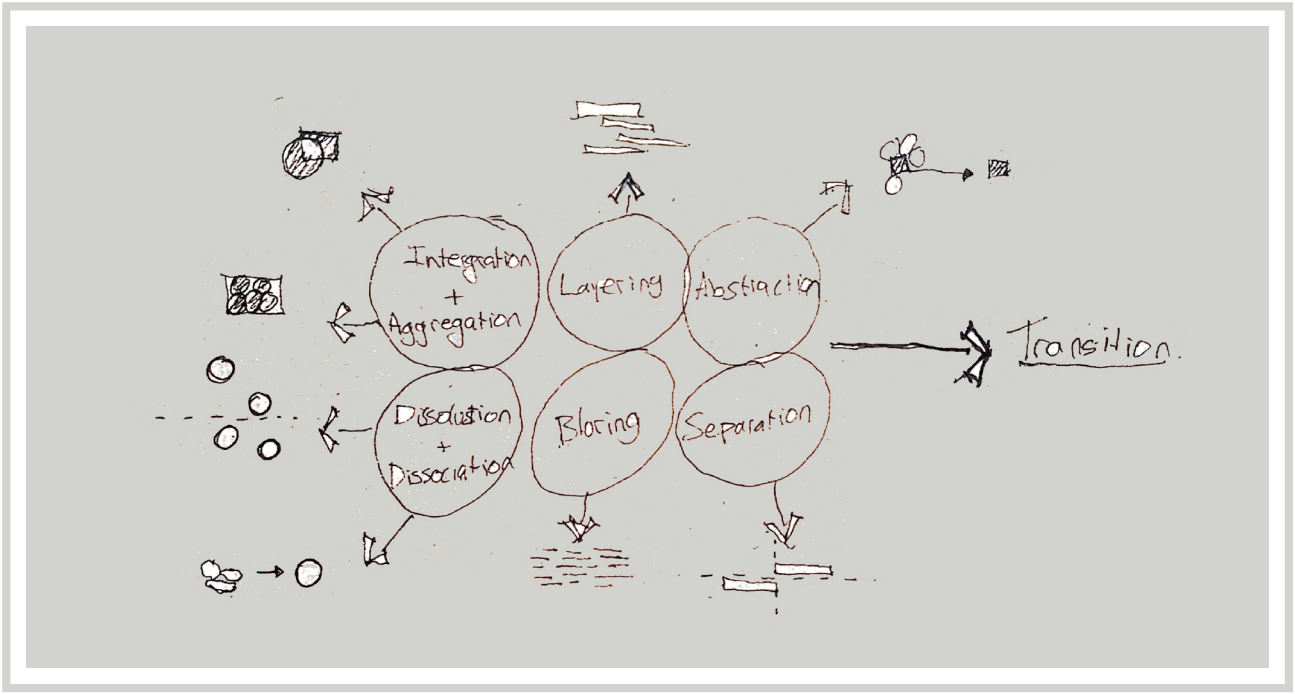
The liminal personae undergoes a molding from one set of accepted behavioral norms, to a new set of behavioral norms. Thus the liminal personae is lost and vulnerable in this state and their transition through this is the most important, as the distinct energy of the in-between can damage or build a person (Turner, 1967; pp. 8-9).



As people distance themselves from fixed states and homogenize and group together, they form 'Communitas'. Here we find an assemblage of vulnerable liminal persona whom have all fallen from structured norms and are experiencing the liminal together. Within a communitas we find the normative boundaries and structures fall away, such as status, class and hierarchy, here equality is found in common humanity (Thomassen, 2009; p. 15). In turn, persona within the state or normative can endure liminality, not as a moment of change, but as a breaka-way. This is a liminoid, such as watching a movie, or attending a dress up party. Once the liminal moment is over, the persona reverts back to state, having experienced a moment of liminality where the commonly accepted boundaries have fallen by the wayside.







A state of amalgamation:

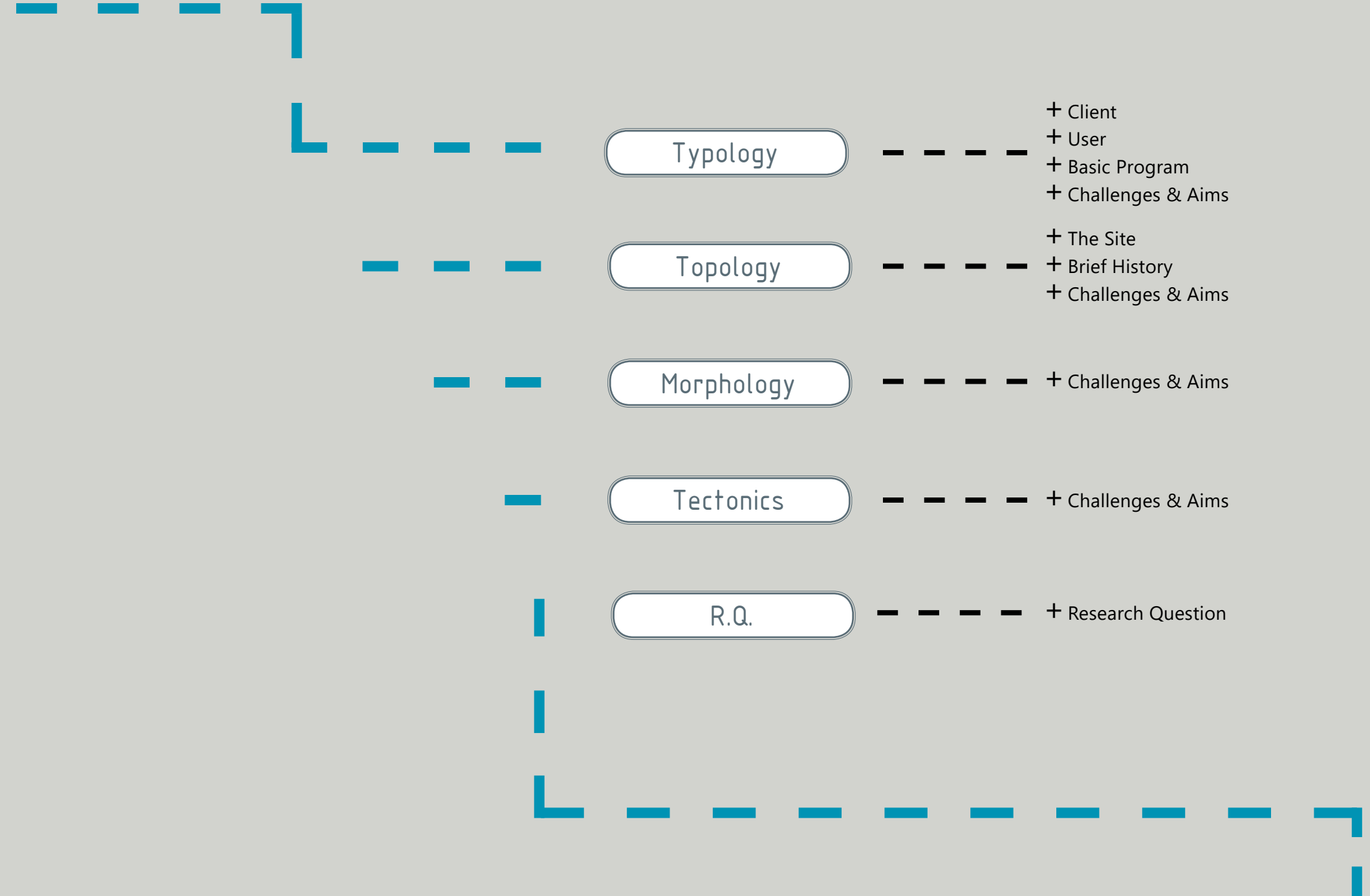
Considering the influences on the liminal described by Turner and Gennep, an amalgamation of experiential differentiations develops the summary of encounters a liminal person may experience when in-between. Not to say there is any order of what should or will all be experienced in the liminal phase. Progressing from experiential phases effects the being and their reaction to the particulate space, and the being in turn effects the consequence of the phase on themselves. Thus embodiment through the liminal phase proposes the experience of the limen. Therefore the liminal ritual should be developed to encourage new experiences or influences, but not prescribe their effects on the liminal persona, leaving the being within the state of change to adapt to the given information and develop personal outcomes. These opportunities could be seen as the compilation of many different experiential states that the being could undergo, as illustrated above. Choice within the liminal builds the individual to become their own version within the post liminal rites (Thomassen, 2014).

> ''There is a need to accord space, time and place for liminal feeling... there are two mistakes which all individuals do: we provide no ritual space at all in our lives...or we stay in it too long.'
>
> – Carl Jung
> Bly, Robert. Iron John: A Book About Men (Dorset 1990)

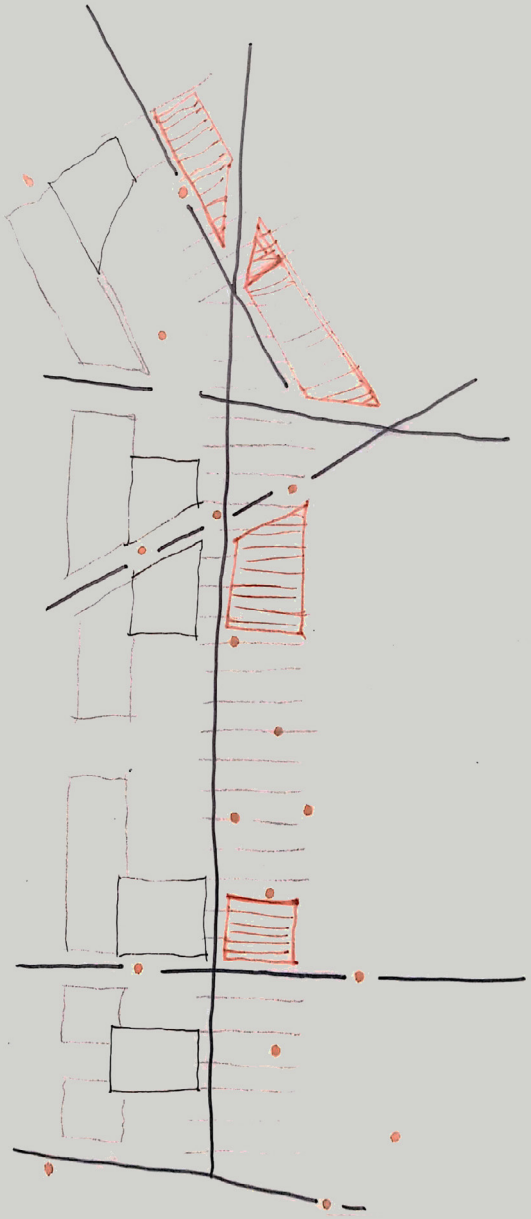
PART 2

Challenges and Aims

Using the lens which was discovered through the research method of the touch stone, and the social underpinning of the theory of Liminality, the dissertation can be broken up into the four principles of design in order to define generally the challenges and aims surrounding the project. The purpose of this chapter is to orientate the research into defined areas of research which will generate the final proposal. These challenges and aims will be defined in terms of Typology, Topology, Morphology and Tectonics. Whilst these principles are separated for research purposes, each is linked and cannot be separated from the other. The type (typology) influences the look or feel of the building (morphology) and the site (topology) influences the materiality and construction (tectonics) of the building. Thus we can understand that the construction will effect the form of the building too, creating a four pronged platform on which the design will be developed. These aims will be amalgamated into a final driving research question which the proposal will aim to understand and portray in a final design.


Typology
+ Client
+ User
+ Basic Program
+ Challenges & Aims
Topology
+ The Site
+ Brief History
+ Challenges & Aims
Morphology
+ Challenges & Aims
Tectonics
+ Challenges & Aims
R.Q.
+ Research Question

TYPOLOGY



As a tree has a certain collection of attributes which separates it from a bush, architecture too possesses different typological attributes which separate a church from a mall. For instance, a church often makes use of a steeple with an audience and a alter, these attributes create an understanding that the building type is a church. While a Mall is larger and usually center orientated with shops lining a long corridor for pedestrians. Thus we see that different types of architecture are derived from typological attributes. Understanding the typological challenges in terms of a Water Fasting Centre which merges the building types of wellness centers and living units will enable the design to formulate aims for the design in terms of programming and function. In order for the challenges to be formulated, an understanding of the user and client's needs is quintessential.

The typology of this design can be understood to be a wellness center which embodies a medical element, residential units and recreational components. Whilst there are existing architypes which are affiliated with such a building, this dissertation aims to understand the client, user and program's specific needs which will influence the varying of the typical architype as well as the combination of different typologies.

CLIENT PROFILE

The need for natural based remedies within our westernized world has been growing immensely. A need for a link between natural remedies and western medical strategies has become urgent.

The proposed client for the Water Fasting Centre in Bloemfontein is Dr. Dimitri Karalis, the owner of The Natural Hygiene Clinic in Hermanus, Western Cape, South Africa. He intends to grow his healing base throughout South Africa, with a secondary clinic in central South Africa. This Centre will be privately owned and managed by Dr Karalis and his wife, with managing director (Physicians) who have vested interests in alternative healing.

Dr. Karalis is a qualified Naturopathic Physician (1973) who opened the first Natural Hygiene Clinic in Africa. Due to high demands he has since moved the clinic from Johannesburg to Hermanus for larger capacity. The demands on the clinic are ever growing with each successful Water Fast he and his wife conduct. The clinic has had success improving the quality of life for patients with chronic diseases such as early cancers, gut impurities, addictions, thyroidism and many more.

All healing work is done through OBSERVED FASTING, GOOD REST, HEALTHY DIET, and EDUCATION. The fasting systems help improve a patients immune system, metabolism and rejuvenation of internal organs naturally. These methods of healing ensure the body learns to heal by restoring itself biologically, the way our bodies know best.

The Centre will encourage education, not only of the users experiencing the fast, but for the public at large. A lecture hall will offer public lectures for interested community members who can grow their understanding of fasting and natural health.

Figure 2 - *Dr. Karalis and his wife. (Unknown, 2017)*

THE NATURAL HYGIENE CLINIC

USER PROFILE

The design proposal aims to offer a breakaway from the modern medical industry and focus on self healing through peace and enlightenment for all who visit. The healing is proposed for physical as well as mental health through the inclusion of fasting in a patient's life, along with a dietary and lifestyle change.
The main user will be the clients of the fasting program, with their needs being the primary focus. The clients using the platform will vary from medically ill patients, to patients with poor lifestyle habits and clients who which to embark on a detox. Patients will be medically supervised and receive daily educational talks on a variety of aspects of natural healing, these will be followed by recreational activities. The Doctors and auxiliary staff will ensure the wellness of the patients as well as the natural environment and the building itself.
In addition to the private institute, a fourth user will include the public from the 7 Dams Conservancy. Here their interaction with the patients will be guided by the design, where self health becomes a focus of discussion. The existing rituals of the 7 Dams users will be used and improved through the design.
The public will be invited to attend lectures in aid of growing an understanding of the possibilities of natural health, whilst the existing medical centers within the area can be offered opportunities to unite natural healing and conventional medical methods.
Thus the design aims to grow an understanding and knowledge base of the possibilities of healing through using natural remedies.

PATIENTS

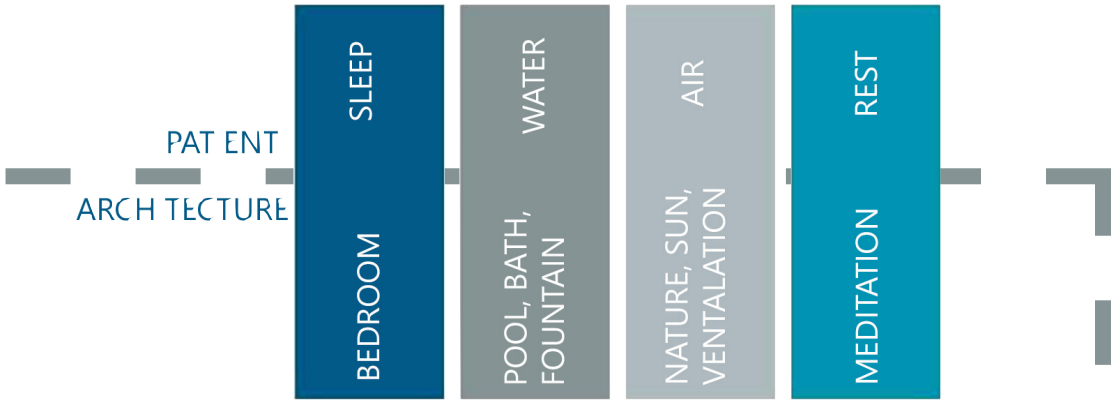
DOCTORS

(ADMIN AND UPKEEP) STAFF

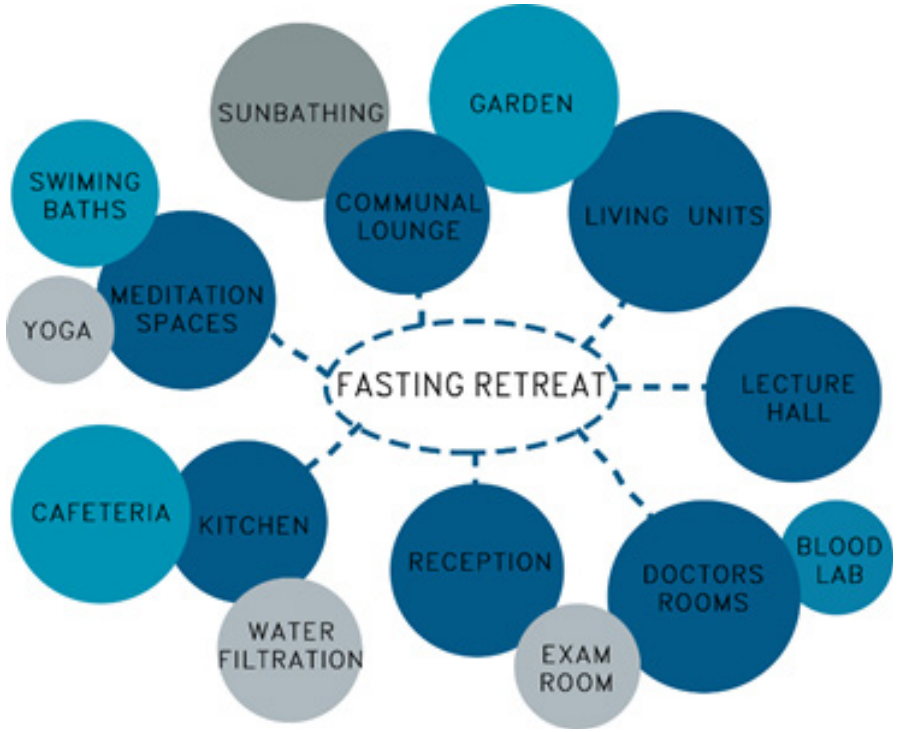
(7 DAMS USERS) PUBLIC

A WATER FASTING RETREAT

IN BLOEMFONTEIN, FS.



PROGRAM: A basic proposal for the accommodation required.



CHALLENGES AND AIMS:

One of the largest typological challenges will be to create a medically safe environment for clients to fast in, without the "hospital feel" of a medical facility. The design should fit into the landscape and not become programmatically too large as to overpower the natural landscape. Logical flow from program to program should be ordered with clear public – private distinctions. Considering retaining a simple program for the design, questions the complexities of the dissertation and thus should be tectonically complex. The proposal should aim to offer a design which is homely and inviting, yet simple in its being, as to expose the functions. Inclusion of nature into the building will be imperative to it's success, as is finding the in-between of nature and the built world.

Typically retreats are removed from society and placed out of the urban construct so as to create isolation. This design should challenge this typological approach.

The design will need to create a warm safe space for clients to interact with the medical practitioners, where privacy can be felt. The staff will require a staff room where intercommunication can occur if a client is in need of deeper observation.

The essence of the design will be to create a safe space for clients to individually enjoy the awe of nature, whilst maintaining a safe monitored fast. Inevitably there should be free flow from nature to building and human throughout the design.

TOPOLOGY

Topology refers to the nature of the surface of the earth, the boundaries, both perceived and real, important characteristics and the geni-us loci (the feel of the site as described by Norberg-Schulz). When designing it is imperative that careful consideration be applied to the existing cultural climate, the history, the physical geographic aspects such as climate, political restrictions and last but not least, how the site is situated in the existing human patterns (Behnisch, 2015). These become imperative not only for the site itself (micro topology) but of the surrounding context (Mezzo topology) as well as the city as a whole (Macro topology).

The site

Discovering a site which aligned with the project and the theory of liminality proved more challenging. Initially I had considered three different sites in different locations. Each site had a close connection to water with a multiplicity positive aspects. These three sites were explored in the conceptual development phase (See part 3). Topology requires an in-depth site analysis of the quantitive and cognitive qualities and limitations specific to the site, this too can be found in Part 3.

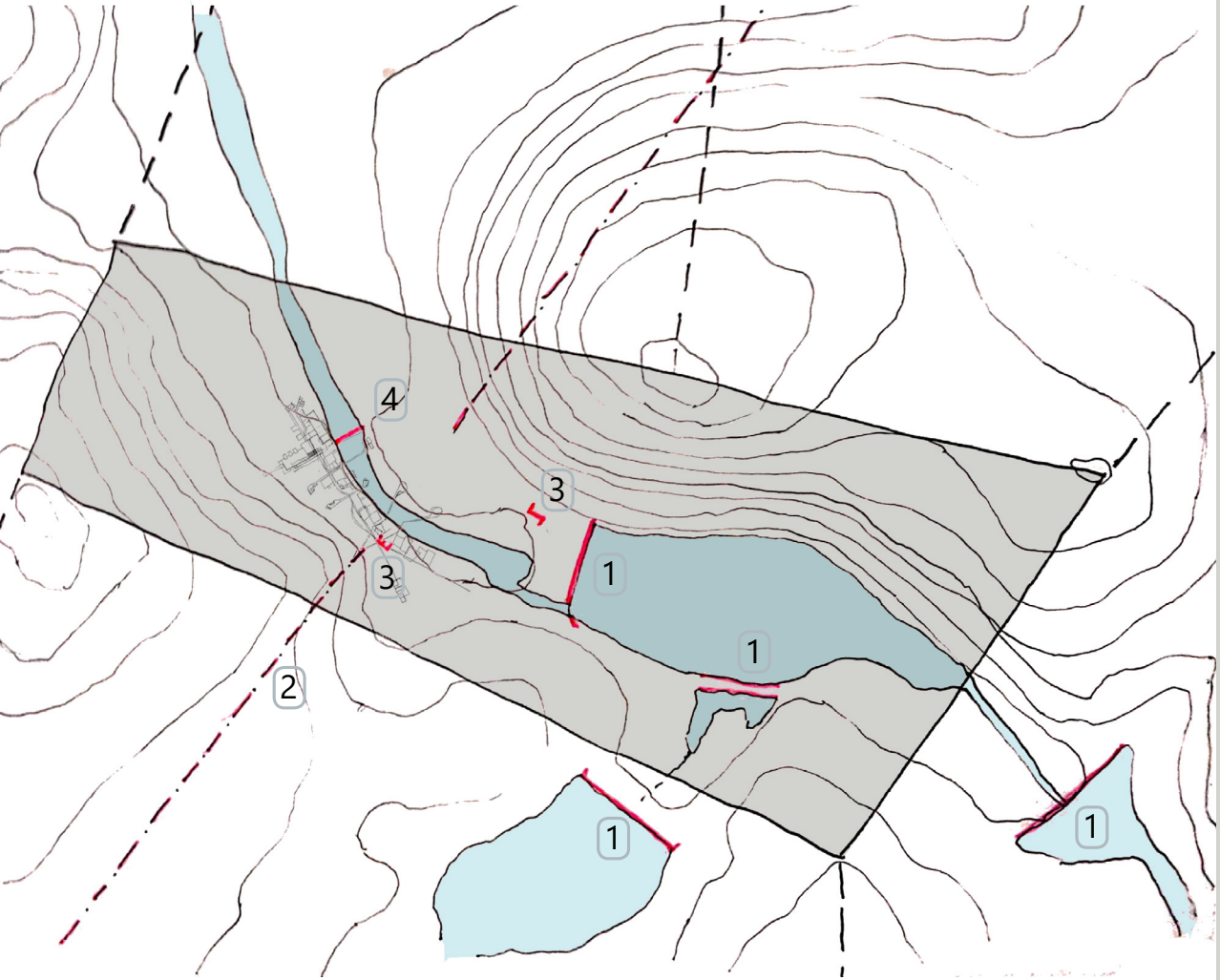
The chosen site is located to the north of the city of Bloemfontein. The proposed site sits in an almost enclosed green space between the N1 and the ever growing city suburbs. Abutting the site is the 7 Dams Conservancy, which is used by the local urbanites for leisure activities in nature. Large numbers of fauna and flora are present on site, with a series of catchment riverine areas and small dams.

The site becomes a haven in the concrete jungle, a breathing space of peace and nature. Whilst the site boasts astounding views of nature, with the break-away feel, it is still in close proximity to all the urban utilities. As the project progressed it became apparent that proximity to elements such as hospitals and airports are imperative to the success of a water fasting retreat. Clients should be able to access the center with ease, from both medical facilities as well as their homes.

There is a significant slope on the site which flattens out toward the river bank. The foliage on site is an amalgamation of different biomes, which vary in threatened classification.

Basic historical parameters

The area the site is located in was once used by the British Army in the Boer war. Multiple historical structures exist on the site and are predominantly built from the stone found on site. These should be protected with a sustainability plan (part 4) throughout the design process.



1 Stone dam walls

2 Anglo Boer War stone wall

3 Historical stone ruins

4 Stone dam walls where the design resides

CHALLENGES AND AIMS:

Sensitive biomes existing on site urge the design to touch the ground sensitively and protect the natural. The design aims to disrupt as little of the existing flora and smaller mammals and reptiles which exist on the site. The slope of the site offers the opportunity to gain views on nature, whist creating privacy.

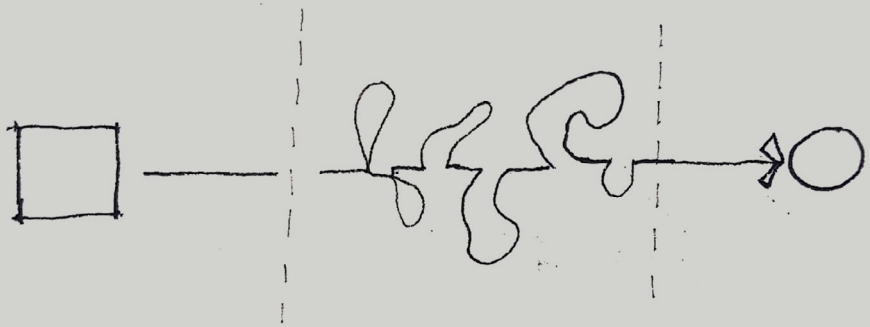
Existing trail networks on site, due to the 7 Dams Conservancy, develop into a design tool, so as to not disrupt existing rituals on site, but rather layer the liminal ritual atop existing routes. Understanding that the 7 Dams Conservancy is used by many people from all walks of life, the design aims to welcome the passersby into planned spaces for the public, but discouraging them from walking through the center.

The existing historical elements on site should be incorporated into the design so as to be protected from further decay and offers the possibility of using disturbed rock on site as a building tool to reference historical elements.

The primary aim would be to reintegrate nature and humans throughout the design, embracing sensitivity and respect.

MORPHOLOGY

Morphology refers to the form of a building. Morphology is a compilation of the studies in the Typology and Topology of the building and site. The Typos and the Topos challenges along with the inherent qualities of a Water Fasting Center is what creates the form giving of a design (Dassah, 2011). The Morphology generates the placemaking in terms of the lived experience throughout the building.



The morphology of the design will be guided by a theoretical exploration into the liminal, which is discussed in Part 3. The former will be related to the typology and greatly influenced by the topology of the nature on site. Considering the accumulation of topologies on site, elements from romantic, classical and cosmic will be effective throughout the design.

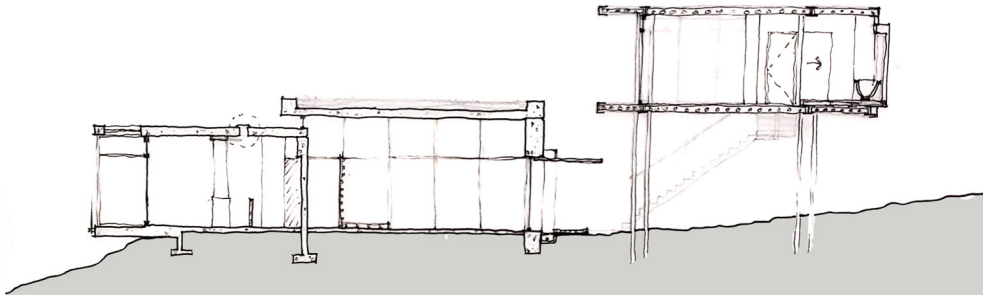
Challenges and Aims:

An unavoidable challenge for the design will be controlling the interwoven collection of morphological influences. The form of the design should aim to fall within nature, and not become an overpowering force, as urbanity typically does. While the project will be a construct of many different architypes, the form and feel of the design should be the unifying element.

As the project aims to focus on nature, with water as central motivation, it becomes apparent that they should be the driving forces behind the form of the building. Considering fasting as the liminal, the design need to address emphasizing and ritualizing liminality throughout, mimicking the liminal and in-between.

TECTONICS

In simple terms, tectonics is the joining of materials, but architecture requires more than a simple nut and bolt. Tectonics becomes an art in its fine design and contemplation of materials with systems of joining. Essentially tectonics is the art of putting a building together logically. The careful design choice associated with each physical part of the design which translates the typology, topology and morphology into a physical construct (Maulden, 1996).



The approach toward the structure of the design should focus on sustainability as a whole. The construction process should be as undisruptive as possible while the structure should aim to respect the natural. The building itself should provide thermal comfort to the users, this becomes particularly challenging when using large glass facades. Sustainable technologies and mechanisms, with thorough research, will be applied to promote the respect towards nature. The tectonics of the design should be of a complex nature, as to embrace each built element throughout the design without waste.

Challenges and Aims

The primary aim for the technical approach, will be similar to that of the morphological aims, where the construction techniques should respect nature and utilize natural systems as to create a comfortable environment. The materiality should withhold the sentiments of liminality and nature. Such an approach will truly mend the disconnect between humans and nature.

RESEARCH QUESTION

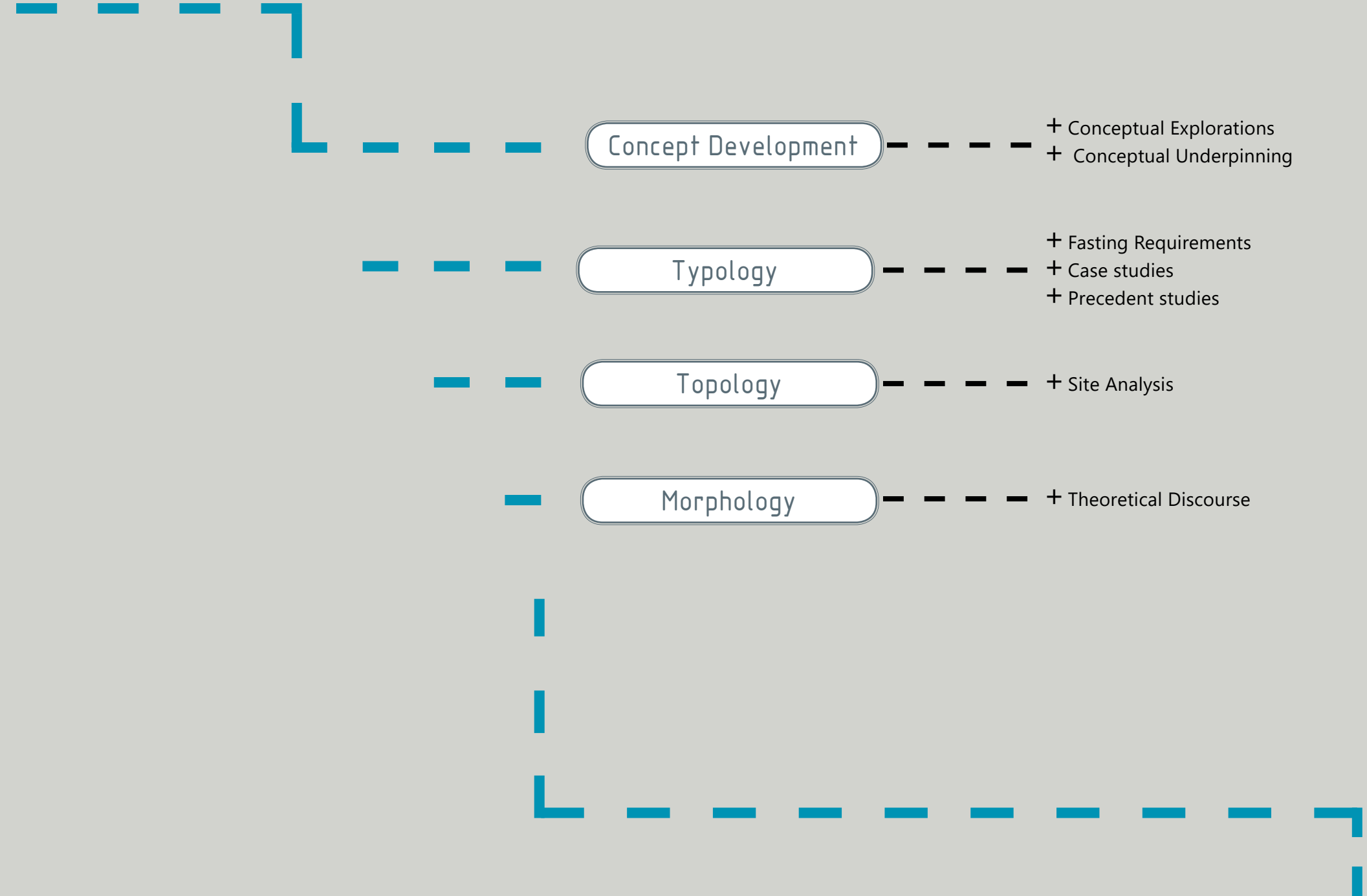
Mending the discon-nect between health and nature through ritualized liminality.

How can the concept of RITUALIZED LIMINALITY, based on NATURE and SELF-HEALING, facilitate the design of a WATER FASTING RETREAT in Bloemfontein, 7 Dams?

PART 3

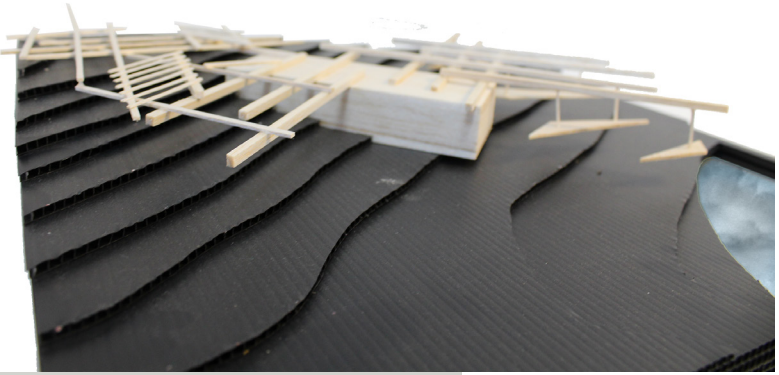
EXPLORATION AND GROUNDING

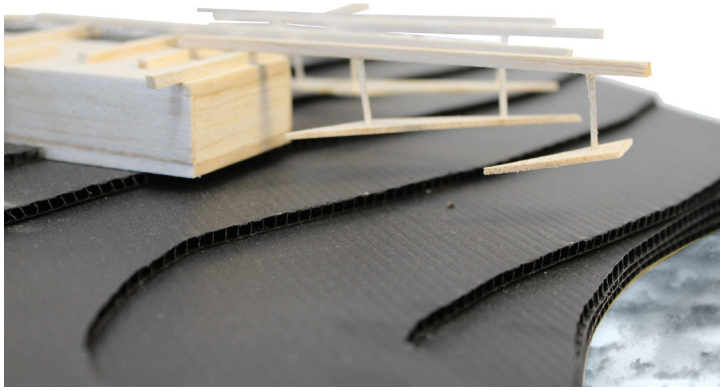
+ This section of the Document explores the four design principles and their challenges by using research and grounding via literature reviews and precedent studies to formulate possible solutions to the proposed challenges and aims set out in Part two. Here the lens is narrowed by the Research Question in order to produce project specific resolutions.


Concept Development
+ Conceptual Explorations
+ Conceptual Underpinning
Typology
+ Fasting Requirements
+ Case studies
+ Precedent studies
Topology
+ Site Analysis
Morphology
+ Theoretical Discourse

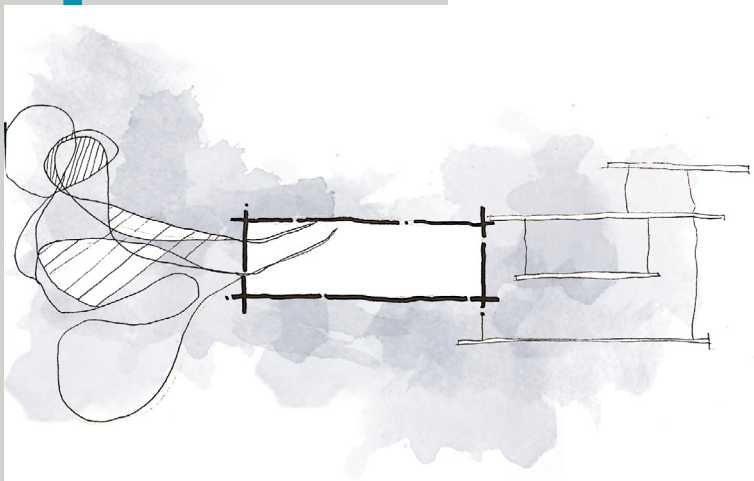
CONCEPTUAL DEVELOPME

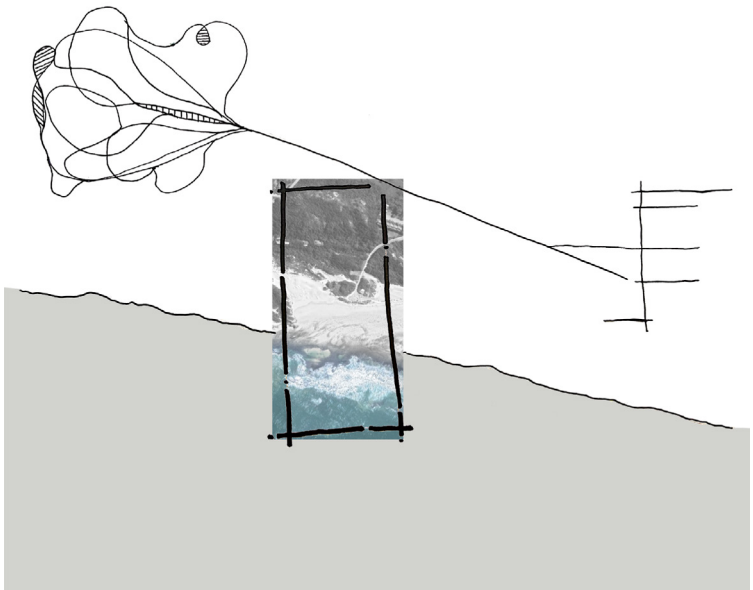
DESIGN CONCEPT 1 – **BALANCE**





BALANCE ● HARMONY ● CONTROL ● CHAOS



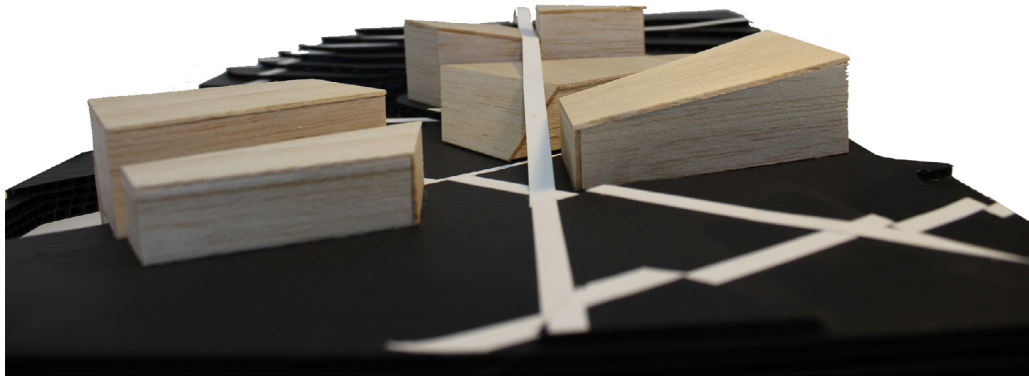


KENTON–ON–SEA, EASTERN CAPE

Each concept revolves around a specific site. The concept exploration aided in selecting a site which inherently had a closeness to nature and a balance of the in-between.

The first concept was structure around mind-body-soul and discovering a balance. Education and guidance would become the control amongst the chaos. The site becomes a the in-between of the rhythm of the ocean and the static of the vegetation. Key notions become apparent, such as reflection upon nature for wisdom, with a harmony of balance between different states.

RITUAL – DESIGN CONCEPT 2

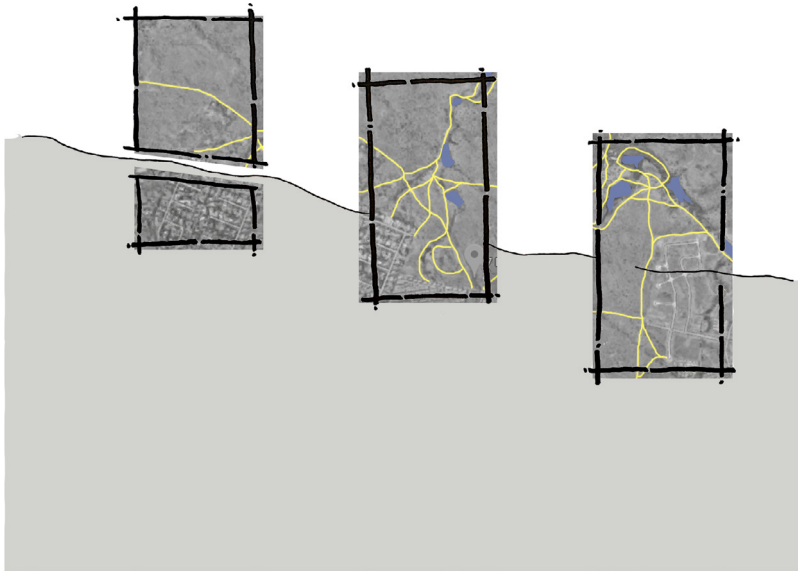


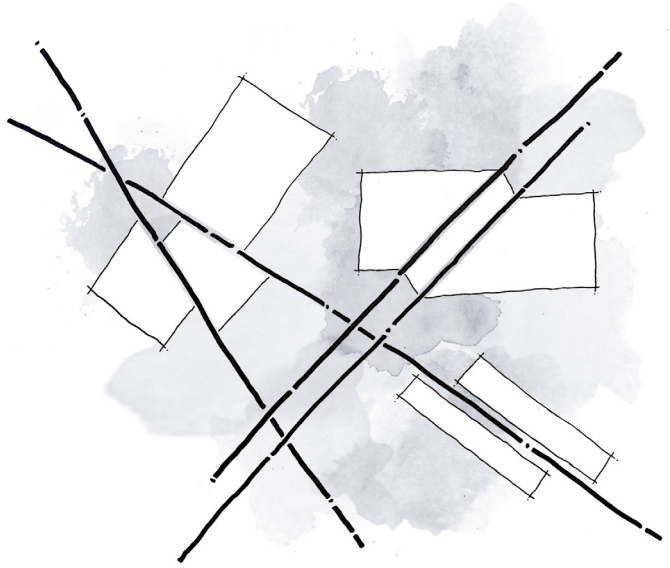
SEVEN DAMS, BLOEMFONTEIN

RETAIN ● ALTER ● PREVAILING ● COLLISION

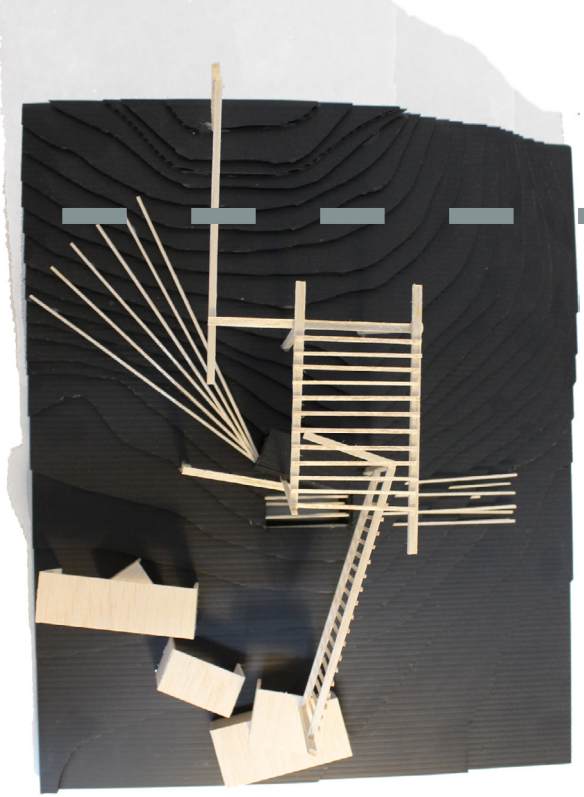
The second concept is based on the outskirts of Bloemfontein, in a conservancy. Here ritual becomes the driving force. The concept explored using the existing rituals on site (paths and walking) and creating a new ritual for the fasting centre.

The incorporation of nature as an existing ritual in which the individual formulates their own narrative becomes a key concept. Using existing rituals and imposing new rituals for greater purpose.

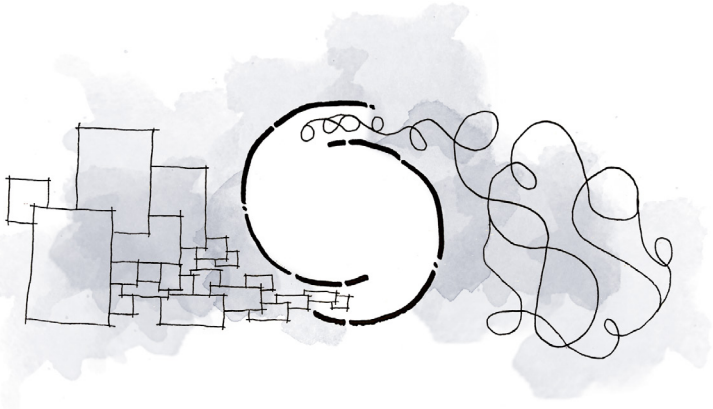


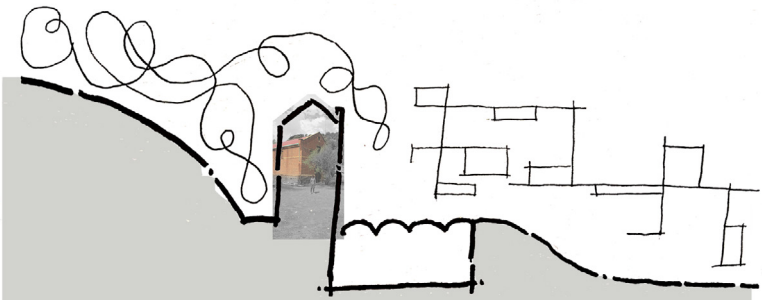


DESIGN CONCEPT 3 – LIMINALITY



PAST vs. FUTURE ● JOURNEY ● COMBINE ● SENSITIVITY





WATER RESERVOIRS, BLOEMFONTEIN

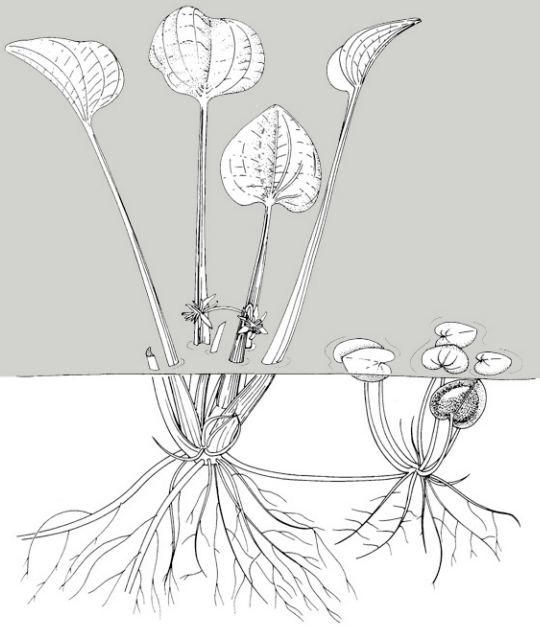
The third concept explores the Water Reservoirs alongside Navil Hill in Bloemfontein. The site posed a essence of strong connection to our past (past states of water on site and our history of fasting). The space becomes a refuge to mourn our past, but use the knowledge gained as a driver to a future. Sensitivity toward the historic, the city and ourselves provide the basis for a journey in which our beings can be healed sensitively.

CONCEPTUAL FRAMEWORK

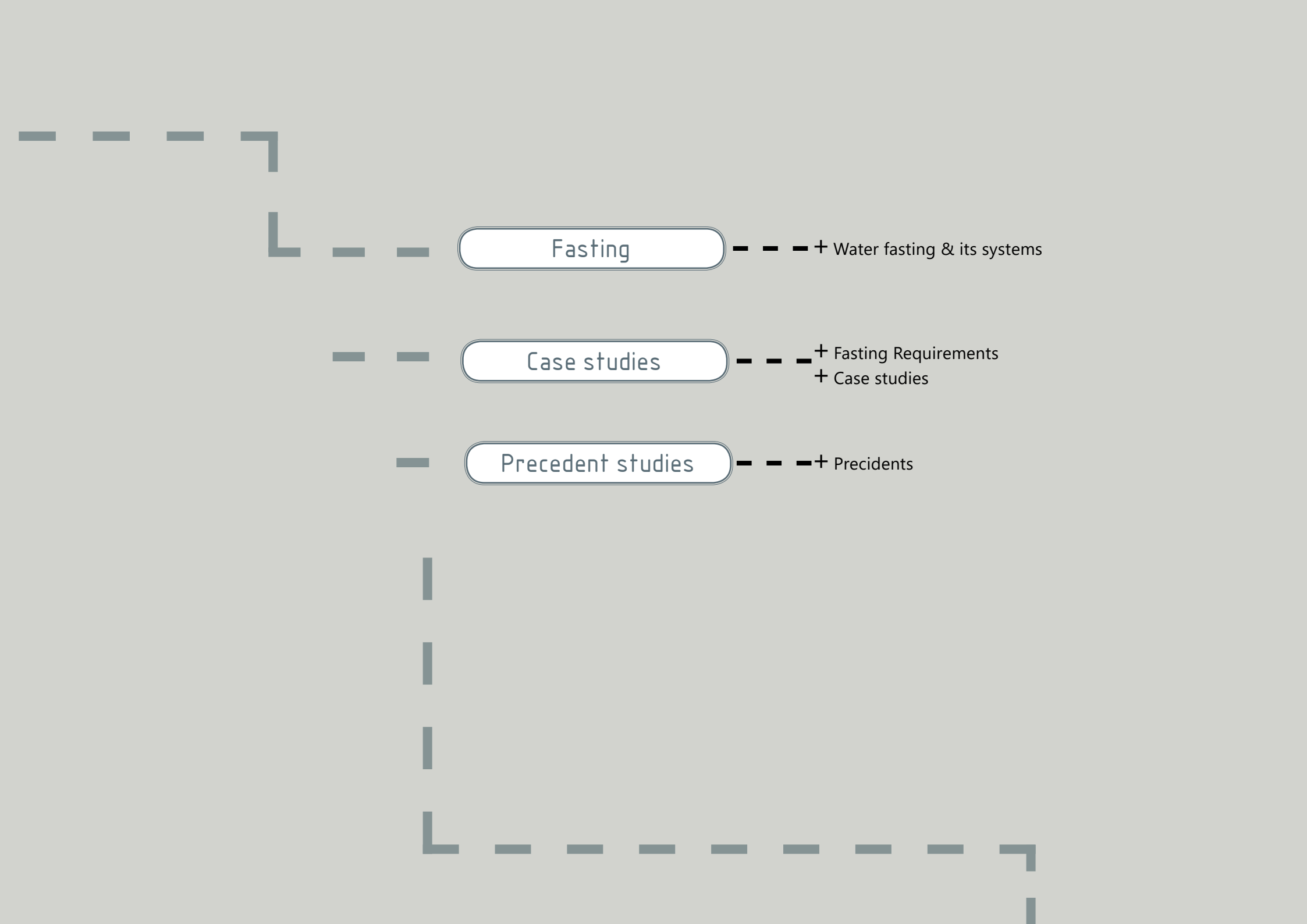
The selected site is adjacent 7 Dams Conservancy. The site offers a rich existence on which the water fasting centre can grow, and become a part of a community, rather than a separated experience.

The overall conceptual aim is to generate a building in which the in-between can become a platform on which new and better rituals can be created, through the inclusion of nature and its systems. Liminality, the in-between, offers a platform on which fasting can become a wider recognised form of healing and revitalizing.

TYPOLOGY



In order to create a building which aims to improve the quality of life of a patient, through **Water Fasting**, it becomes imperative to understand the typological needs of such a building. Such exploration investigates the needs of the ***Patient*** as well as ***building.*** Case studies and architecture which have successfully created spaces of ***healing and reflection*** will be studied. These explorations assist in understanding the accommodation needs of a building and humane needs in the environment in order to develop a design which heals. Thus the roots of the design type emerge through research.


Fasting
+ Water fasting & its systems
Case studies
+ Fasting Requirements
+ Case studies
Precedent studies
+ Precidents

WATER FASTING AND ITS SYSTEMS

Water Only Fasting is the complete exclusion of all food and drink, except for pure water. Due to the extreme nature, medical protocols are essential when accepting clients to undergo a water fast at the center. Guidelines have been set out as to ensure safety of water fasting, as set out below (Finnell, et al., 2018):

1 Clients wishing to water only fast must undergo a preliminary comprehensive physical examination as well as a neurological and psychological exam by a registered practitioner, either from the clinic or privately. These examinations must include urinalysis, a complete blood count including differentials and a comprehensive metabolic panel. These coupled with a medical history study will determine whether water fasting will be an effective healing tool for the client. If Water fasting is not suited, additional methods of fasting can be suggested at the clinic. Unsuited clients include, but are not limited to:

+ Patients taking medication which cannot be discontinued or tapered.
+ Medium-chain acyl CoA dehydrogenase deficiency (unable to breakdown certain fats into energy)
+ Higher-grade cardiac arrhythmias
+ Active gastric ulcer disease
+ Severe liver or kidney disease
+ Certain cancers
+ Advanced cerebral vascular insufficiency
+ Pregnancy or nursing
+ Anorexia

2 Two days prior to fasting, clients are to only eat fresh raw vegetables and fruits with steamed starchy vegetables as a Pre-fasting scheme.

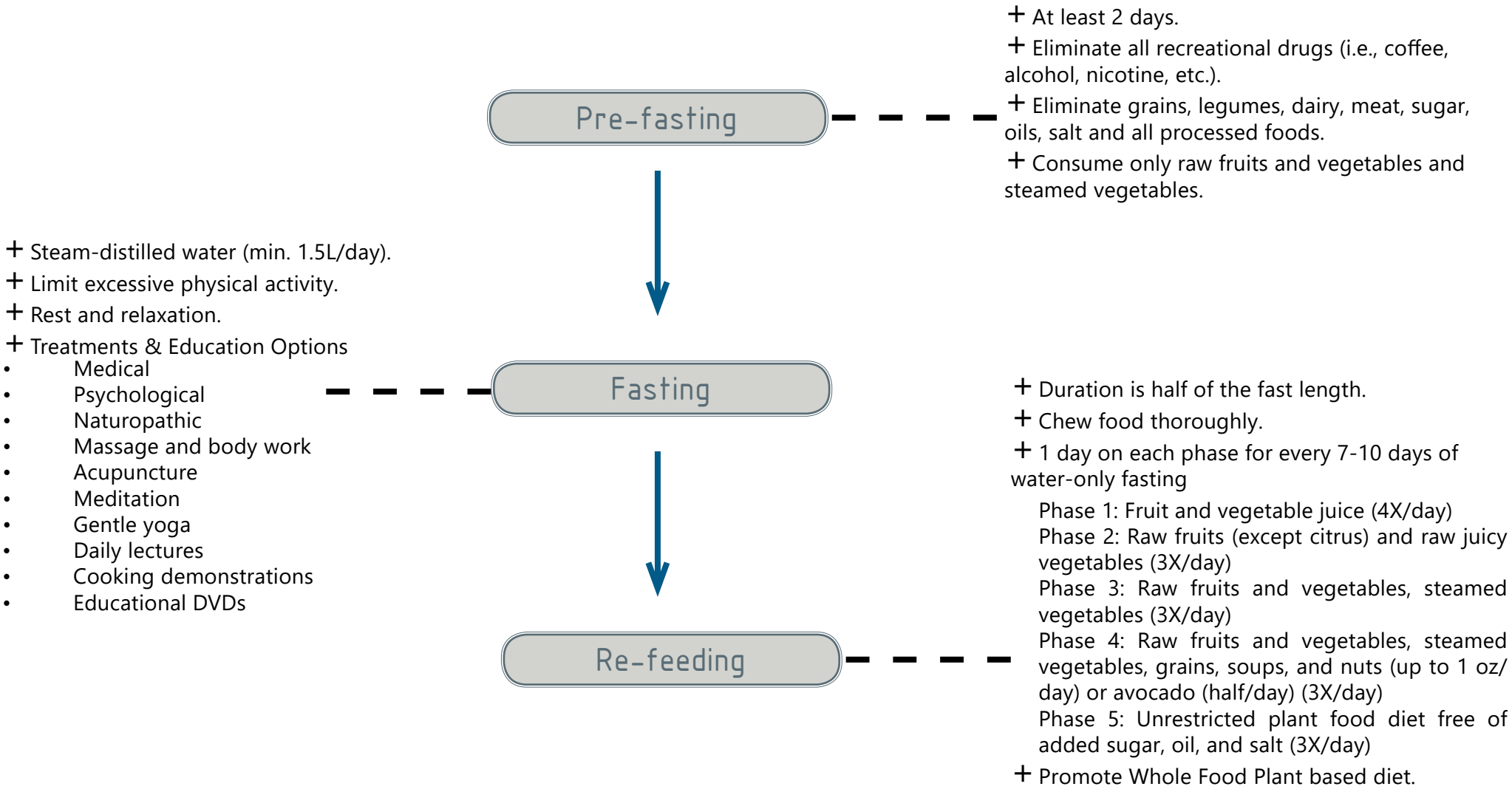
3 The fasting requires a minimum 1.5 litres of distilled water to be drunk. All toiletries are to be avoided as to minimize excess toxins filtering into the body.

4 Clients will be closely observed by practitioners throughout the days of fasting with bi-daily monitoring and recording of vital signs, i.e. weight, blood pressure, temperature and pulse. A urinalysis, complete blood count including differentials and comprehensive metabolic panel will be conducted weekly, or as advised. Additional tests can be done if needed through outside clinical laboratories. Regular one on one appointments will be scheduled with the different physicians on site to ensure mental and emotional health throughout.

5 Discontinuation of the fast will occur when the predetermined time has lapsed, or symptoms have stabilized, the client requests it or it is deemed clinically necessary.

6 After the termination of the fast, a standard re-feeding program commences. The time period for the re-feeding is half the amount of days fasted, where the patients are still closely monitored with bi-daily vital checks and a final exit exam by the on-site medical practitioners, as in the beginning.

7 Clients return to their daily lives where they can live on as close to a whole food plant-based diet as possible whist continuing to practice intermittent fasting. This is a strong recommendation to allow the patient to receive the full lifelong benefits of fasting and natural health, but is not imperative to the water fast and its effects.


Pre-fasting
+ At least 2 days.
+ Eliminate all recreational drugs (i.e., coffee, alcohol, nicotine, etc.).
+ Eliminate grains, legumes, dairy, meat, sugar, oils, salt and all processed foods.
+ Consume only raw fruits and vegetables and steamed vegetables.
+ Steam-distilled water (min. 1.5L/day).
+ Limit excessive physical activity.
+ Rest and relaxation.
+ Treatments & Education Options
• Medical
• Psychological
• Naturopathic
• Massage and body work
• Acupuncture
• Meditation
• Gentle yoga
• Daily lectures
• Cooking demonstrations
• Educational DVDs
Fasting
+ Duration is half of the fast length.
+ Chew food thoroughly.
+ 1 day on each phase for every 7-10 days of water-only fasting
Phase 1: Fruit and vegetable juice (4X/day)
Phase 2: Raw fruits (except citrus) and raw juicy vegetables (3X/day)
Phase 3: Raw fruits and vegetables, steamed vegetables (3X/day)
Phase 4: Raw fruits and vegetables, steamed vegetables, grains, soups, and nuts (up to 1 oz/day) or avocado (half/day) (3X/day)
Phase 5: Unrestricted plant food diet free of added sugar, oil, and salt (3X/day)
+ Promote Whole Food Plant based diet.
Re-feeding

CASE STUDY

TRUE NORTH WELLNESS CENTRE

Architect: Unknown
Year: 2002
Location: Santa Rosa, Califorina, USA
Area: 3600m2

Fasting centre = 3600m²
50 staff members
20 of which are physicians
1000 patients a year
5 auxiliary buildings (not in m²)

58 beds/ patients:
Usually 2-3 bedroom suites
- en-suite bathrooms
-shared living space
- 2 bed, 2 bath = 97m²

Support rooms:
Specialist rooms (Dr., Massage, Chiropractor, examination room)
Lecture Hall
Gym

Kitchen - classes
Cafeteria & Deli (Visitors)
Courtyard
Sunbathing
Swimming

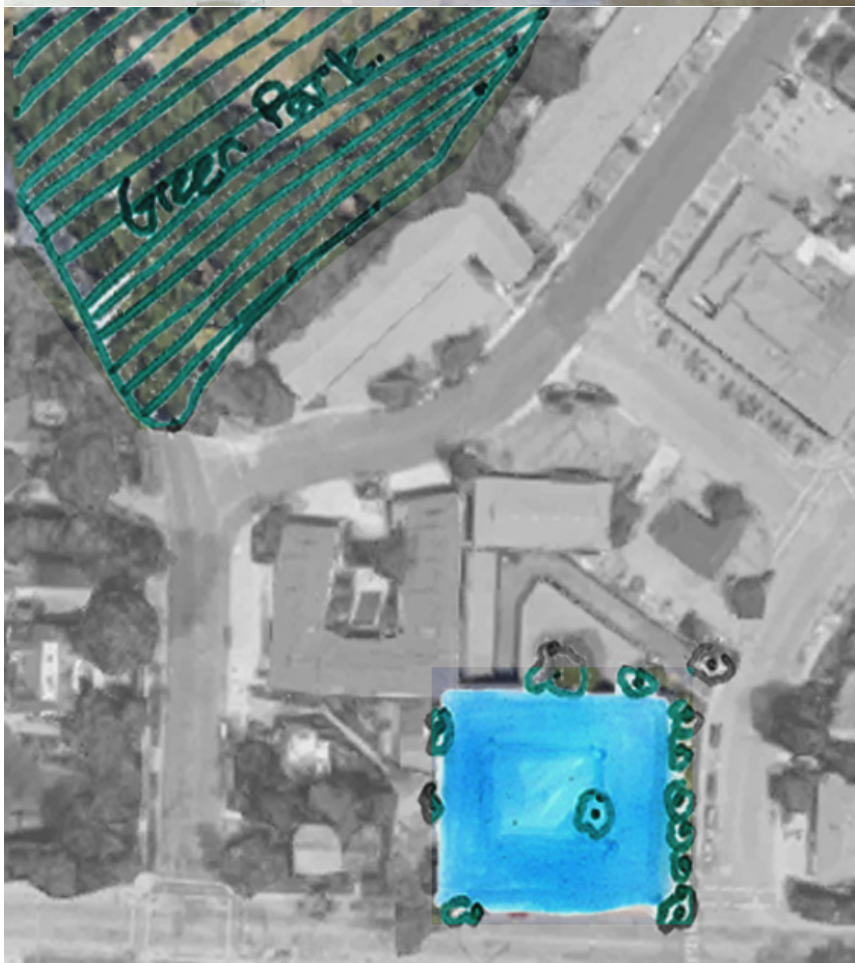
The True North Wellness Centre is a transformed office block which was converted into a Water Only Fasting Centre. The centre is run by Dr. Goldhamer, who is one of the leading physicians in Water Only Fasting and its benefits. Thus the case study guides the project through functional elements for a successful water fasting centre

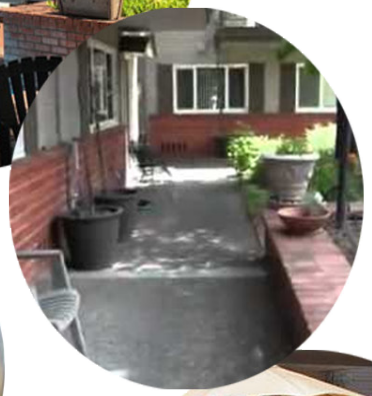
The centre has the capacity to house 58 patients in-house at a time. The living units vary from four to single living units.

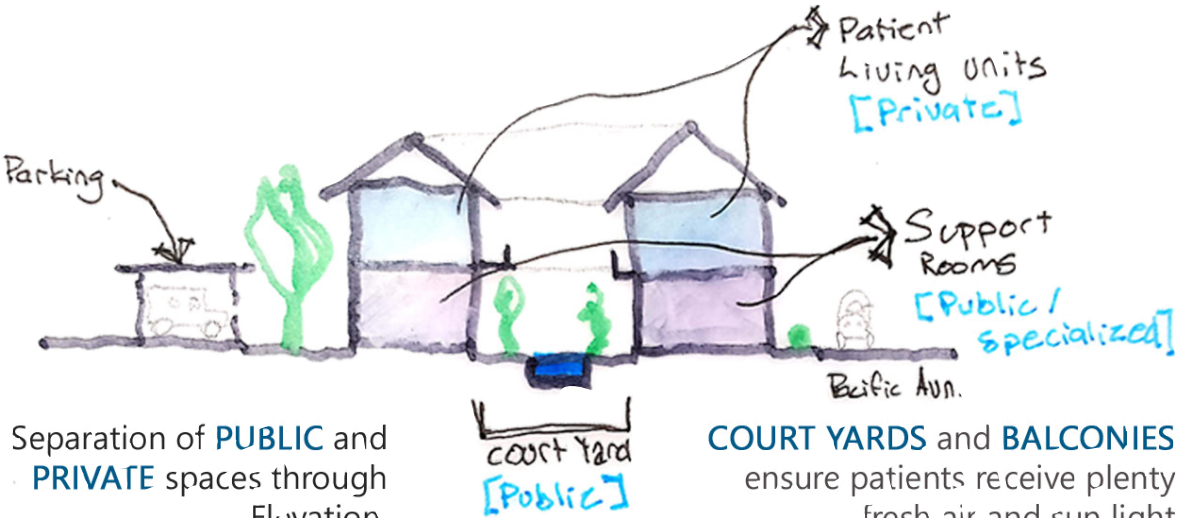
The building is centrally focused with a courtyard. The courtyard becomes an informal meeting area as well as a place to relax and sunbathe for both patients and staff.

There are two entrances, both are placed off the street. The main entrance is for patient admittance and the rear is predominantly for services such as deliveries and staff access.

The building is surrounded by foliage and is in close proximity to a green park where patients are encouraged to meander and interact with the outside environment.







Separation of **PUBLIC** and **PRIVATE** spaces through Elevation.

COURT YARDS and **BALCONIES** ensure patients receive plenty fresh air and sun light

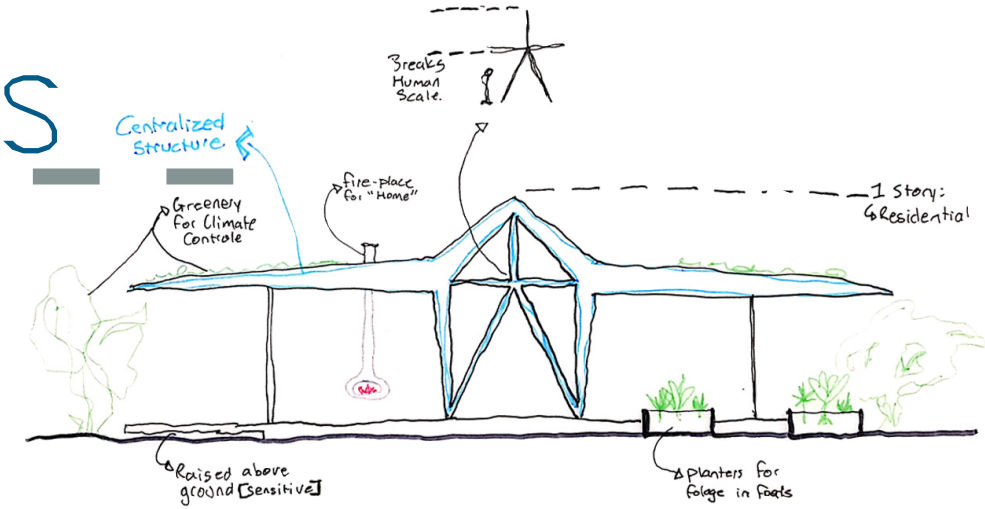
LESSONS EXTRACTED

- Fasting Centres work effectively closer to cities, for medical accessibility.
- Patients should be encouraged to continue with light exercise in nature.
- Sunbathing for absorption of natural Vitamin D is imperative in patients.
- Fresh air to living units is imperative through natural ventilation
- Separation of private and public spaces for privacy and comfort in living units.
- Potential of business growth into auxiliary and public services.

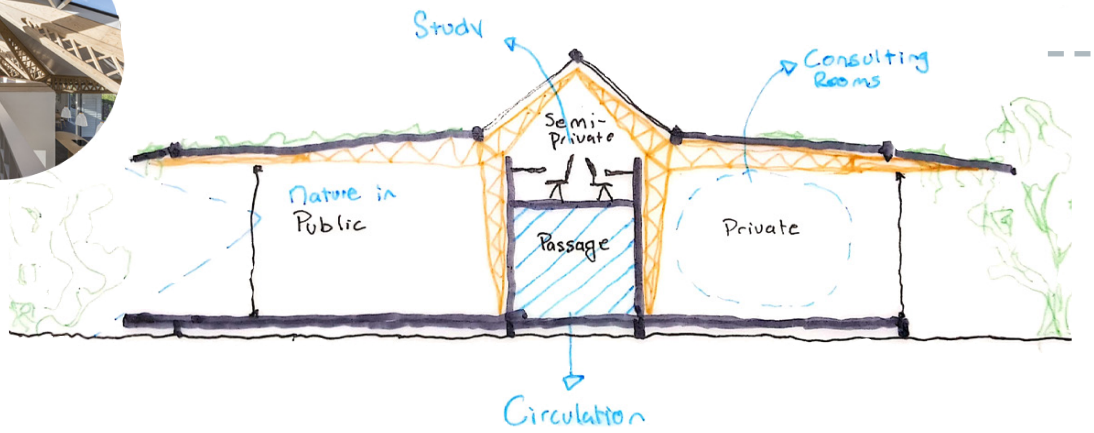
PRECEDENT STUDIES

Maggie's Cancer Centre

Architect: Foster+Partners
Year: 2016
Location: Manchester, UK
Area: 1922m2



There are many Maggie's centres which create a safe space for rest and conversation between cancer patients.
The building houses the more private rooms, where personal welfare is taken care of to the northern side, leaving the Sunny Southern side to the public spaces. Services are pulled to the centre of the building along with "passages" of transition from the public to the private by the lowered ceiling level, thanks to the mezzanine (a study/reading area). A wrap around patio, which pushes and pulls into the centre, brings cool and fresh air into the building. The patio in its jagged edges provides safe spaces of relaxation for patients. The building encourages the inclusion of nature in all its forms, from planters in the garden to growing roof structures over the patio. The building is sensitive in its footing on the earth.

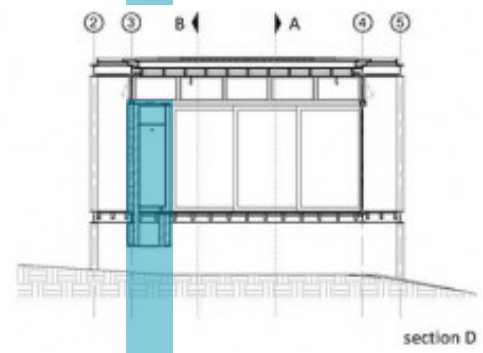


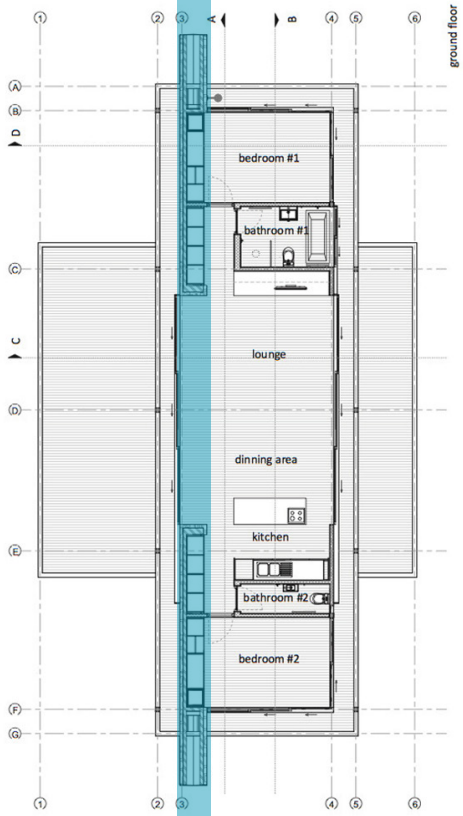
LESSONS

- Breaking human scale with structure.
- Separation of spaces by access routes.
- Using nature as a tool for temperature control and patient activity.

Westcliff Pavilion

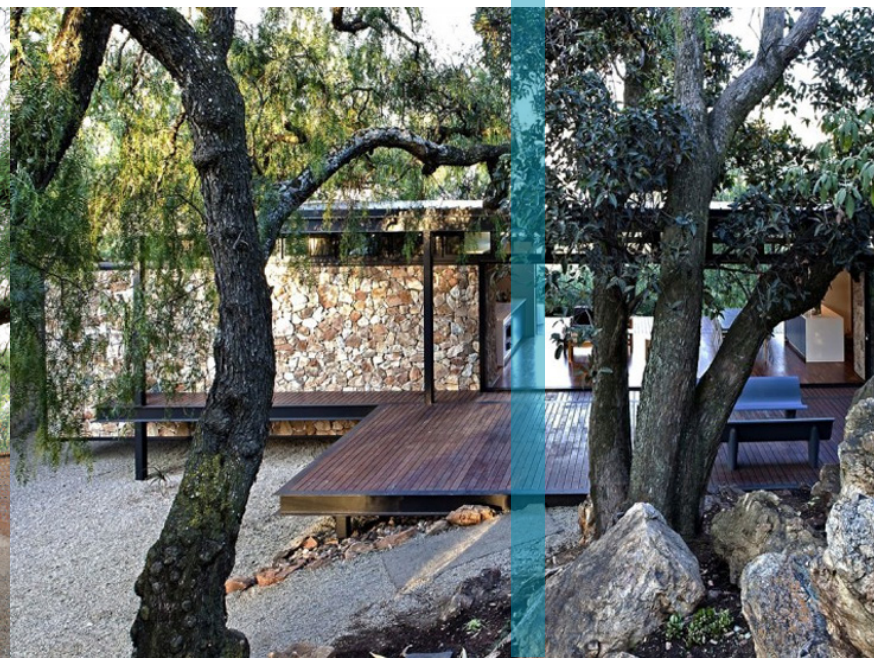
Architect: GASS Architects
Year: 2012
Location: Johannesburg, SA





The Home in Westcliff is an amazing example of sensitivity and sustainable design in a wooded African landscape. The whole building is raised, predominantly with I-beams and hollow tubes, to have a minimal impact on the natural site as well as improve views of the city. The use of the steel allowed for large panes of glass whilst keeping the building structure slim and sleek.
The steel framed Building boasts a guiding stone wall, constructed with stone harvested on site. The beauty of the stone wall is that its stereotomic mass is in-fact raised from the ground creating a scene of floating earth above the earth, contrasting the perception of a stone wall (ArchDaily, 2012).

The stone wall not only acts as the guiding principle, but becomes functional too. The cavity on the interior is utilized for counters and storage. The exterior spaces become voids for ducts.



LESSONS EXTRACTED

- Stereotomic elements can become tectonic through the use of steel structures.
- Use strong guiding elements as functioning supports within the design.

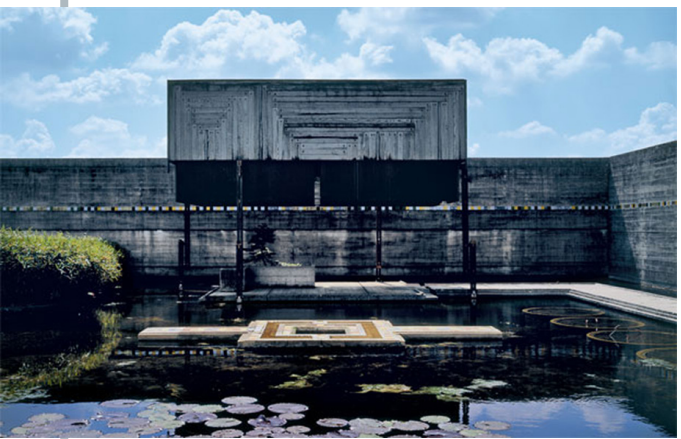
Brion Cemetery

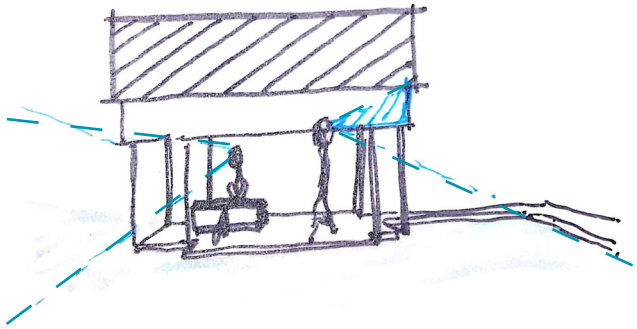
Architect: Carlo Scarpa
Year: 1969–1981
Location: San Vito d'Altivole, Italy

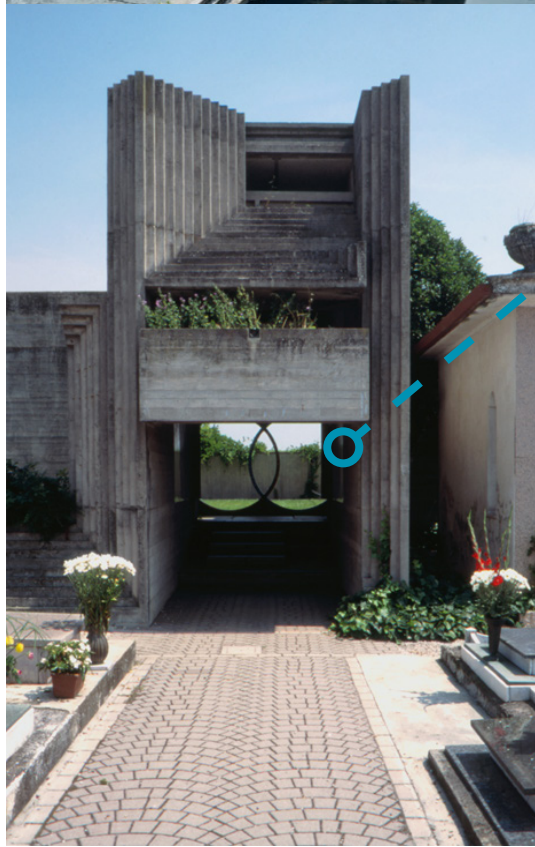
The Brion Cemetery has been described by many critics as a great example of Narrative Architecture (Prosdocimo, 2016). The tomb becomes a public garden of death which transcendes the negativity of death into life.

The Brion Cemetery was designed to entice reflection. The reflection of the monuments in the water symbolise the eternal reflection of the memory of the Brion family, whilst visitor reflection is encouraged through the architecture of narrative. The journey one follows through the cemetery is not of the typical straight line, in the building one side, and out the other type.
The design utilizes gardens, walls, water, buildings and roofs to create an ever-changing experience, concluding in a meditation platform. This platform is topped with a 'box' like roof, just low enough that one can only see out once seated on the concrete bench. Thus when settled, it becomes a place for contemplation and reflection (both within oneself and upon the water which surrounds it).
The use of water at the chapel acts more as a cleansing ritual. The chapel is abutted by water on 3 sides, in order to enter the Cypress garden, one must walk over the water, on stepping stones, a journey of cleansing into the life (nature) on the other side.

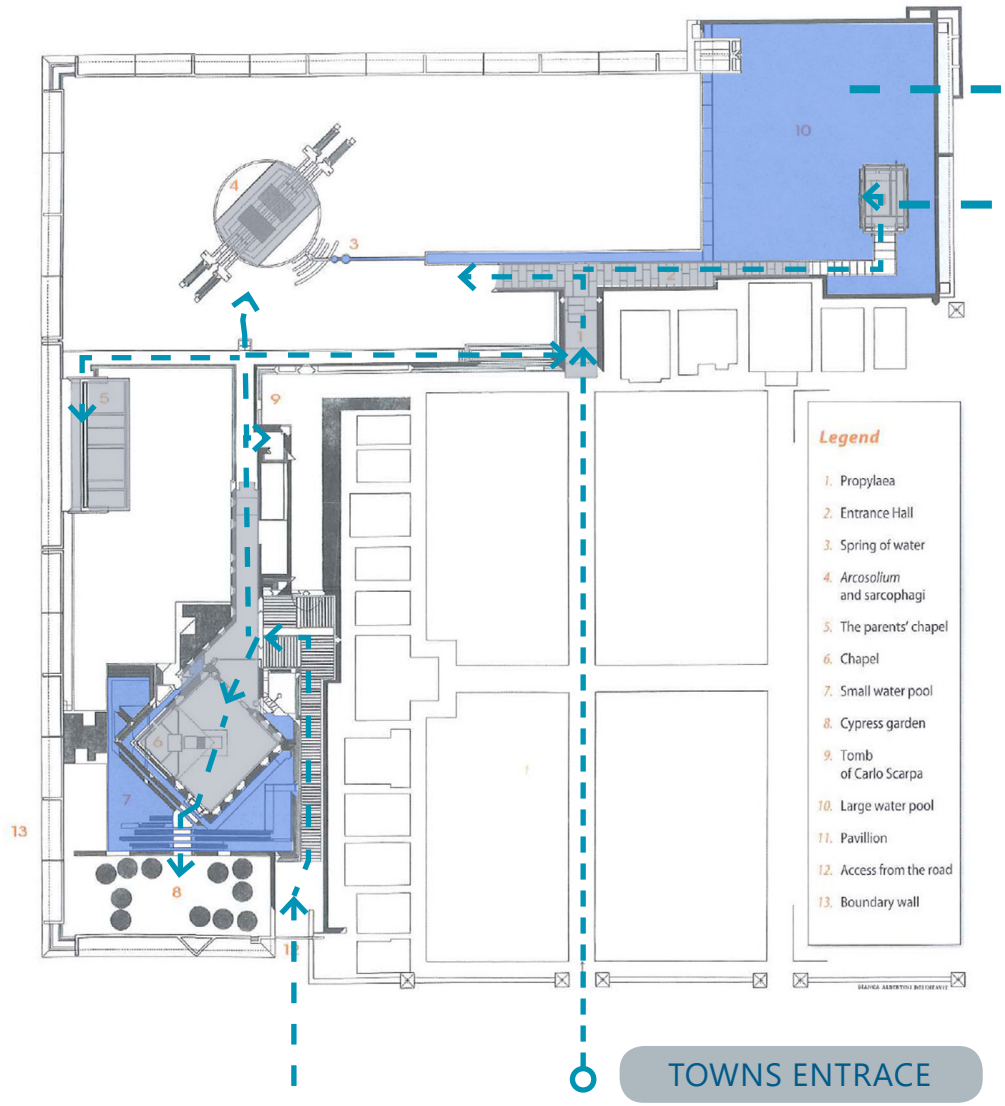
Using concrete, water and vegetation creatively, the design creates spaces of contemplation along the journey of emotion. The tomb design creates tension which is broken through exploration and discovery of these beautiful spaces of meditation (Maziriri, 2013).







THE DIFFERENT PERSPECTIVES



BODIES OF WATER

COVERED SPACES

TOWNS ENTRACE

PUBLIC ROUTE

LESSONS EXTRACTED

- The circulation becomes a journey though experience. Enclosed, compact, free journeys which end at reflection
- Concrete can become emotional texture givers, especially when mixed with different materials.
- Use architecture to encourage contemplation and meditation.
- Water motives as reflection on emotion and the building
- Perspective changes through materiality and form.

Casa Corallo

Architect: PAZ Arquitectura
Year: 1969–1981
Location: Carlo Scarpa

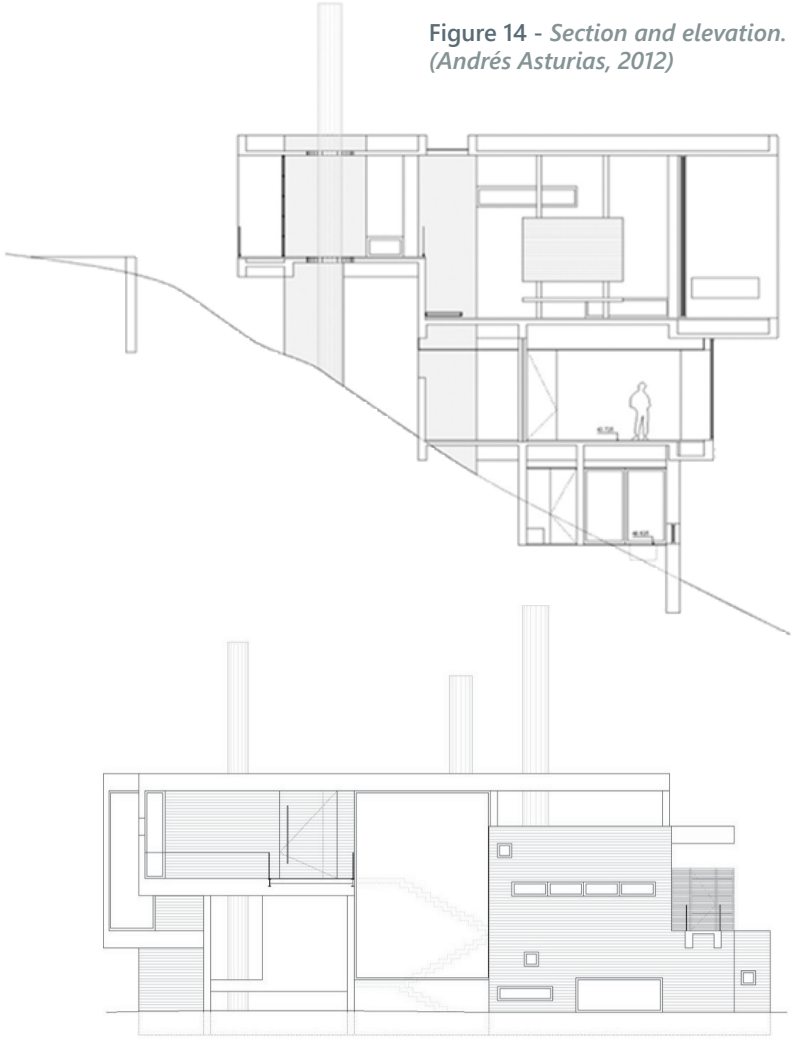
Guiding the design process of this home was the existing trees, which were integrated into the architecture, as well as the slope of the site. The design aimed to expose the 'inside' to the 'outside' with the use of natural elements such as stone and wood as infill elements, within an exposed concrete form with as much glass as possible creating visual links to nature.

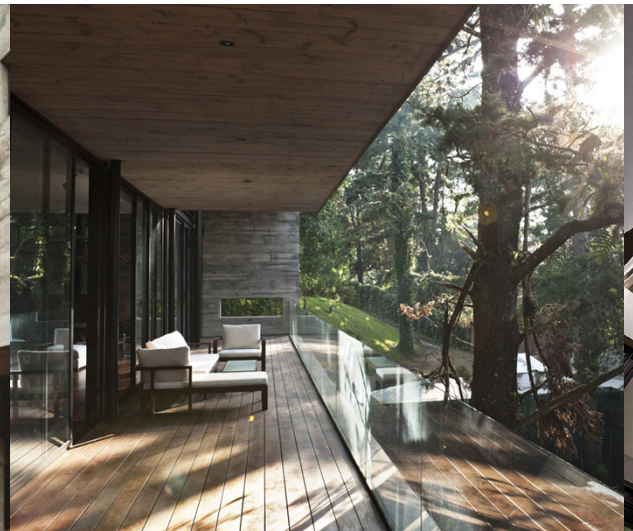
Thus we see the use of the exposed monolithic "wrap around" concrete with infill panels for texture and privacy. These in fill panels are predominantly glass, with timber and stone (ArchDaily, 2012).

LESSONS EXTRACTED

- Stereotomic elements can become tectonic through the use of steel structures.
- Use strong guiding elements as functioning supports within the design.
- Material use.

Figure 14 - *Section and elevation.*
(Andrés Asturias, 2012)





Tree House

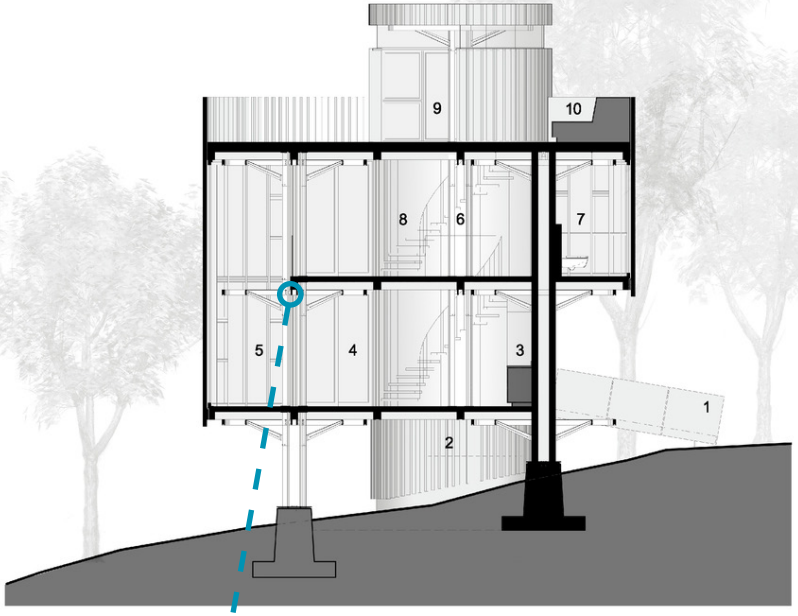
Architect: Malan Vorster Architecture
Interior Design
Year: 2016
Location: Cape Town, SA
Area: 117m

The one room hideaway in the wooded hill side in Cape Town. The building sits in an existing clearing, raised high to mimic the surrounding trees, whilst taking advantage of the views. The design worked with the notion of the in-between space, taking advantage of the liminal and detailing the void. The building is raised off the ground, offering an opportunity for a plant room on the ground level, with the living space on level one and the bedroom on level two. The roof is not forgotten, and designed to be an outlook deck.

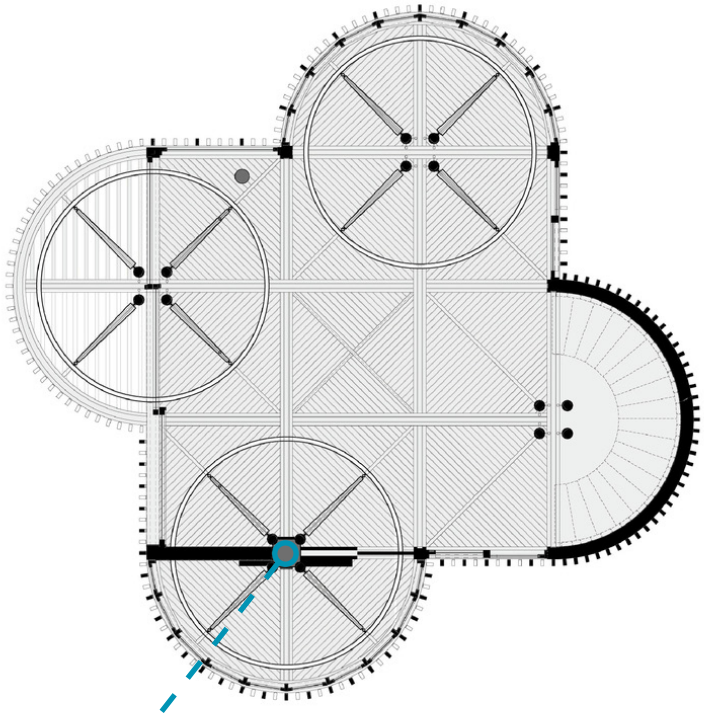
The structure of the design is based on a square which is abutted by circles on all four sides. The center of the circles house the column structures, which have been split into four trunk-like structures. This slims the structure and again mimics the tree like feel of the site. These trunks then support, with the help of arms, a ring like structure which acts as a support for the floor and envelope. All these steel elements are laser-cut and folded Corten steel, connected to the timber floors with brass hand-turned components. Each material used is left in its untreated form to express the passing of time in their natural weathering process (ArchDaily, 2017).

Figure 16 - *Internal Prespective of the House (Mickey Holey, 2017)(online)*

Figure 15 - *Tree House in the clearing (Mickey Holey, 2017) (online)*



Section



Structural diagram

0 1 2

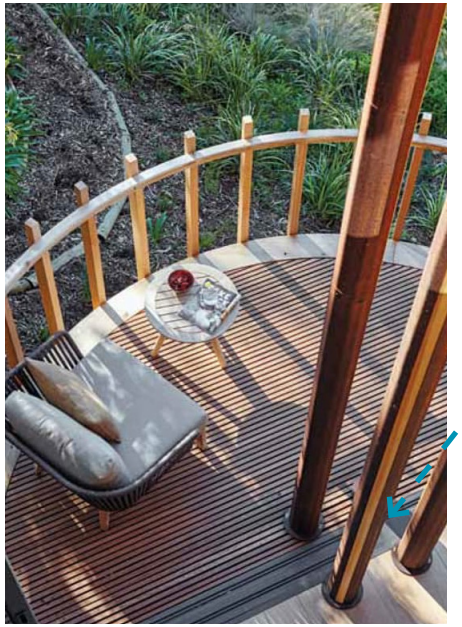


Figure 17 - *Internal structure of the House and its detailing (Mickey Holey, 2017)(online)*

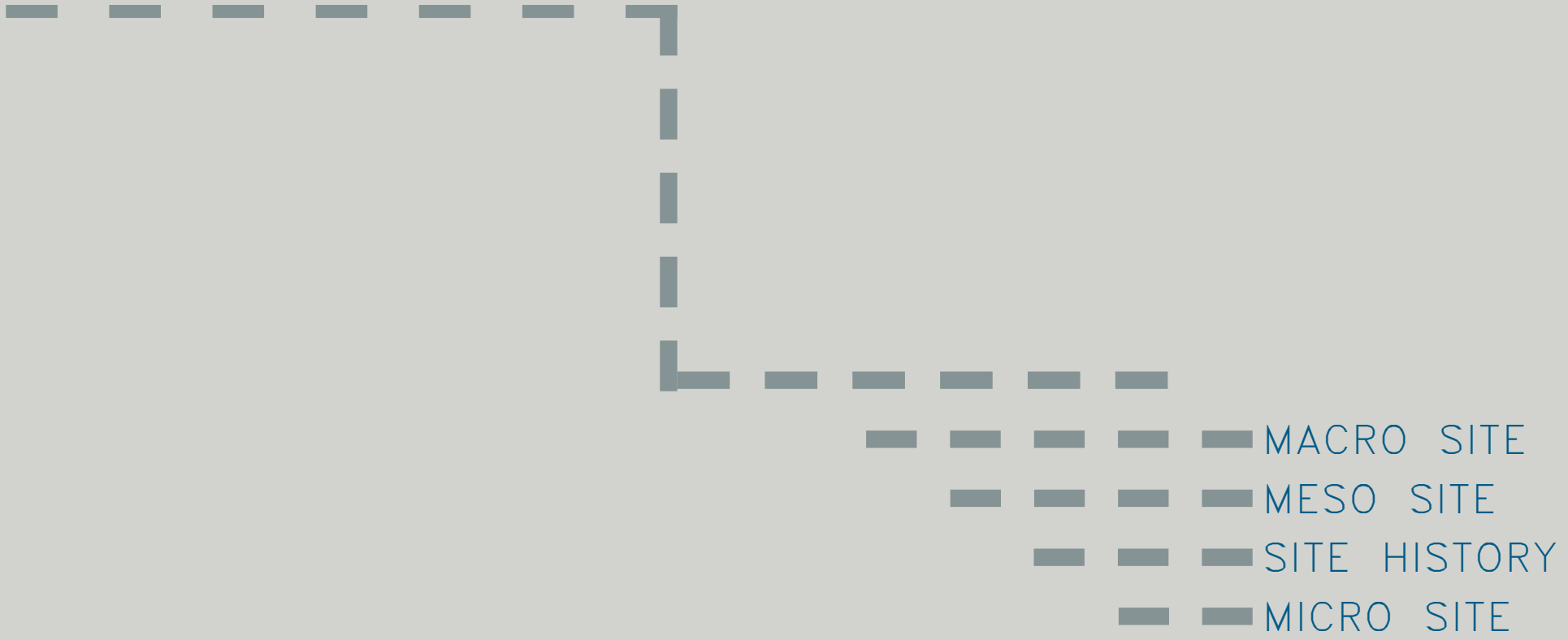
LESSONS EXTRACTED

- Using Corten-Steel as a structural component.
- Breaking columns up to allow façades to run between the structure.
- Use column supports to emphasise tree-like forms.
- Creating a Tree House in a South African context.
- Leaving materials to weather and show time.

TOPOLOGY

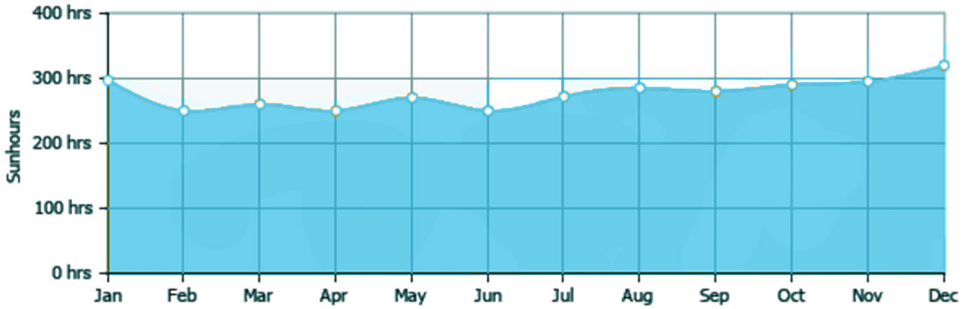
SITE ANALYSIS

Picking a site for a **Water Only Fasting Retreat** has proven more difficult than expected. Typically **retreats** are placed in a **landscape** which has close to not visual connections to our urban lives, focusing on nature as a **biophilic** relaxer. While typically, from case studies, **water only fasting centres** are placed within the **urban** environment so that accessibility to the centre is easy, from both the urbanites to the centre as well as the centre's accessibility to medical facilities. The medical facilities and the centre work in a **symbiotic relationship**, where ill patients who wish to use the water fasting program as a **healing tool** can easily be admitted and directed, while the fasting centre uses the medical centre's medical laboratory for test analysis from patients with specific needs.


MACRO SITE
MESO SITE
SITE HISTORY
MICRO SITE

MACRO SITE

The chosen site is on the peripheral of the Bloemfontein City, close enough for shorter weekend fasts or educational talks for local residents but in a quiet and calm area with visual links to the main city. This is important as the design hopes to become a place of change which is not so protected as to make reintegration back into the urban lifestyle difficult.
The Free State climate boasts warm summers with cold winters but is fortunate enough to maintain good sunlight hours throughout the year (Pete Ashton, 2003). These long days of sun become a clue to design for and integration into the aesthetic qualities for both interior and exterior spaces.



DAYS OF SUNSHINE

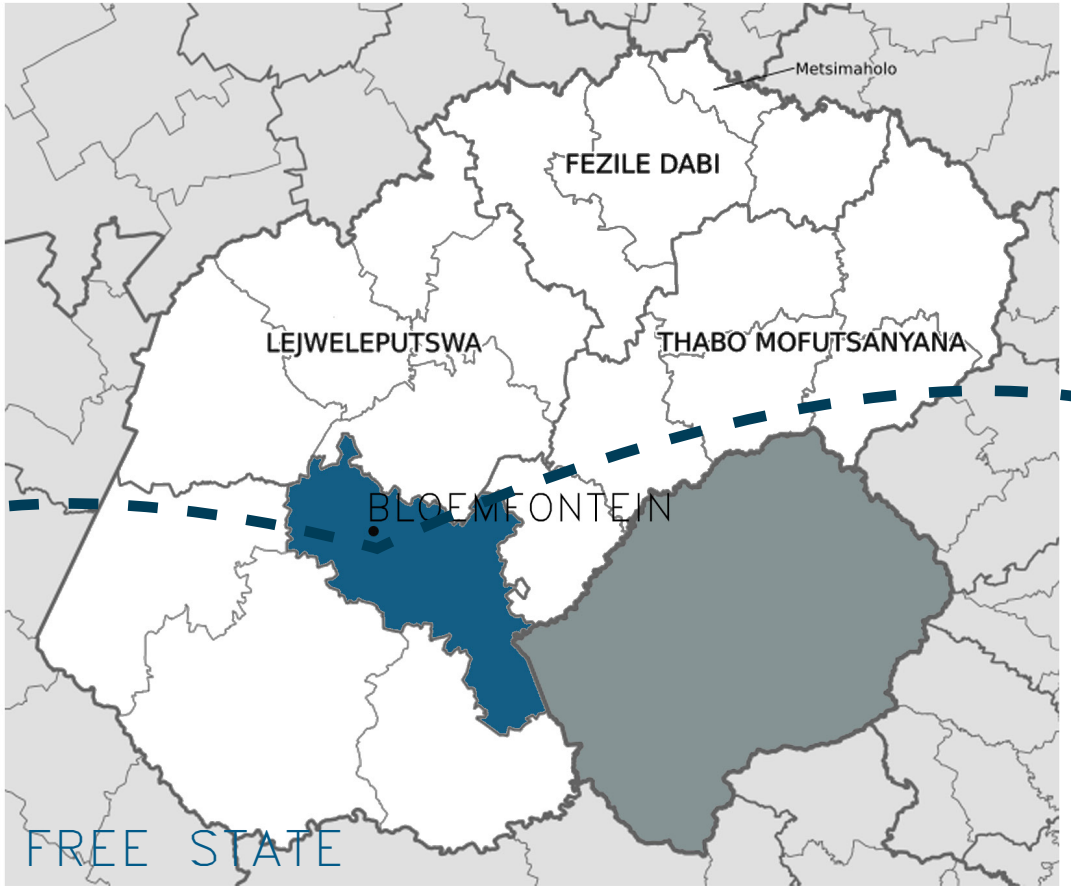
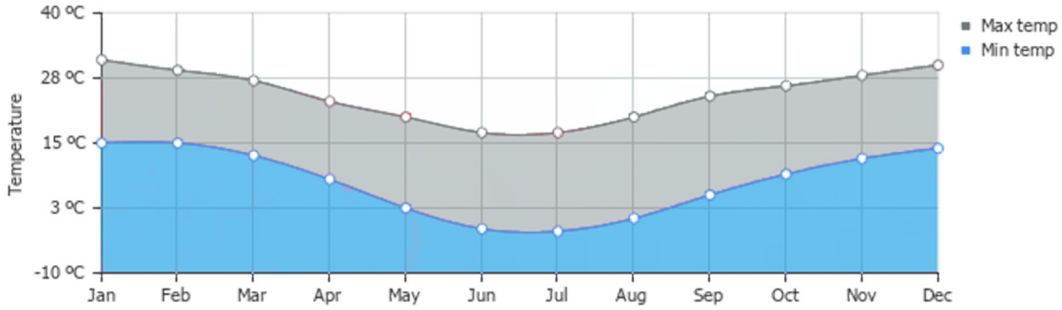
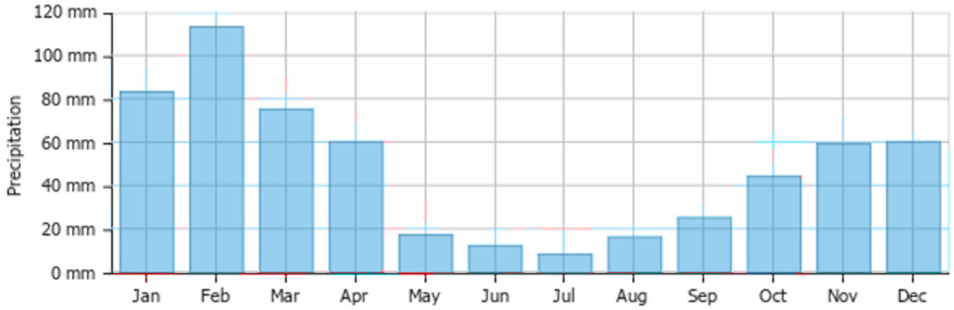


Figure 18 - *Projectlocality.(P.Vorster2019)*

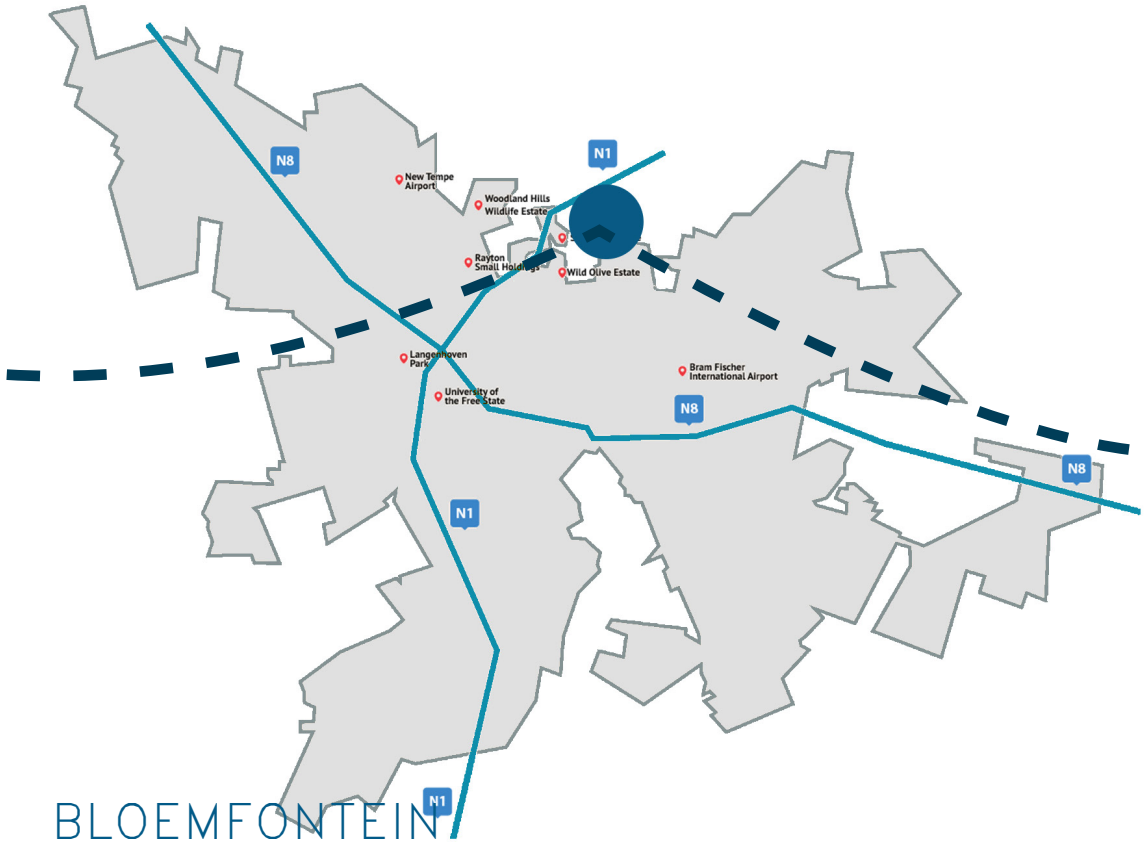


AVERAGE TEMPERATURE

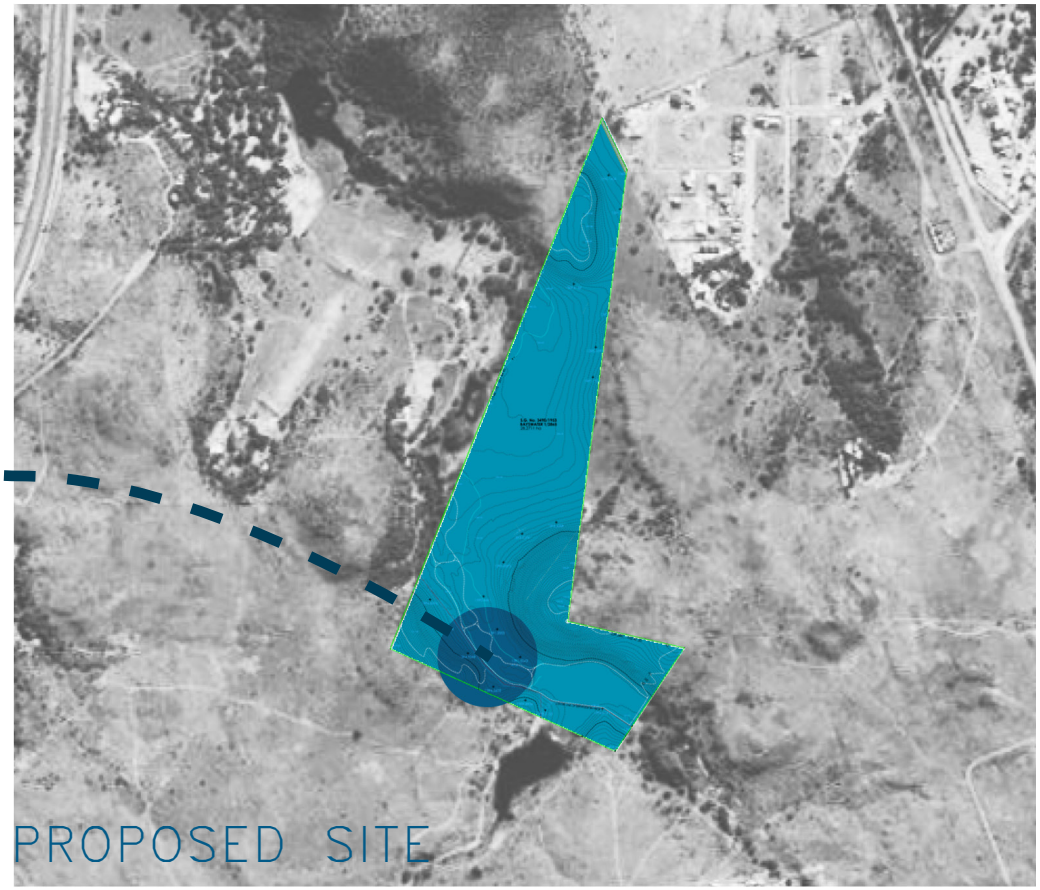


MONTHLY PRECIPITATION

Figure 19 - *Bloemfontein climate. (Adapted by P.Vorster 2019)*



BLOEMFONTEIN



PROPOSED SITE

The city is home to many top level medical facilities as well as a successful medical faculty at the University of the Free State, as indicated in Figure 3. The availability of these medical facilities strengthens the Water Only Fasting Centre as the symbiotic relationship can vary from education (the University of the Free State) to healing both physical (Hospitals) and mental (Bloemcare).

The site chosen sits on the border of the 7 Dams conservancy on the northern side of Bloemfontein, whilst running routes and adventure paths run through the selected site, it is not considered a part of the Conservancy itself.

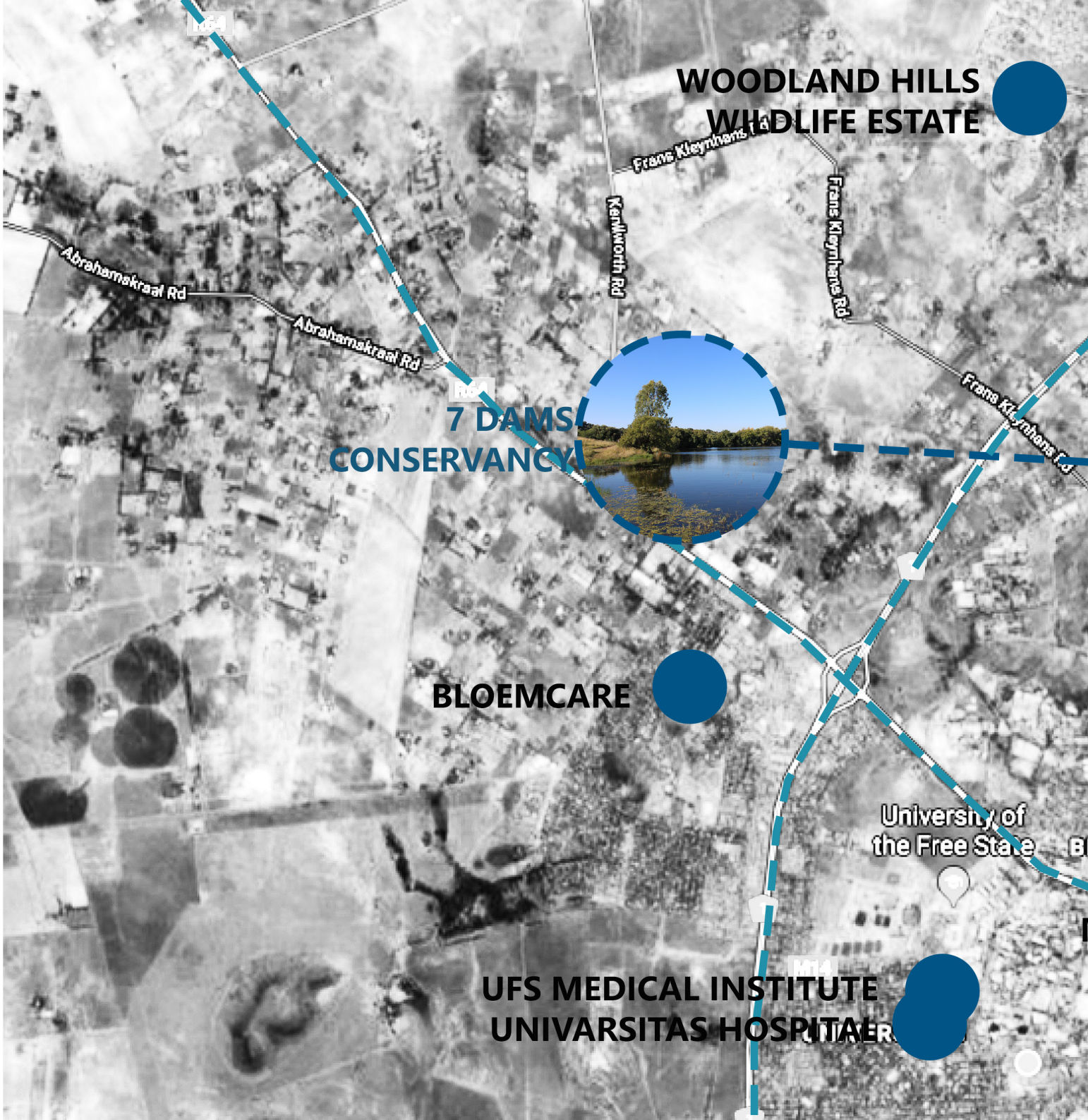


Figure 20 - *Context map indicating the surrounding point of interest which would impact the functioning of the Water Fasting Centre.(P.Vorster 2019)*


BLOEM SPA
BOTANICAL GARDENS
PROPOSED SITE
NORTHRIDGE MALL
NAVAL HILL
WESTDENE
MEDI-CLINIC
AIRPORT
Bram Fischer International Airport
AFB Bloemspruit
Tielman Roos St
Deale Rd
Wilcocks Rd
Rudolf Greyling St
Raymond Mhlaba
General Dan Pienaar Dr
Parfitt Ave
WILLOWS

MESO SITE

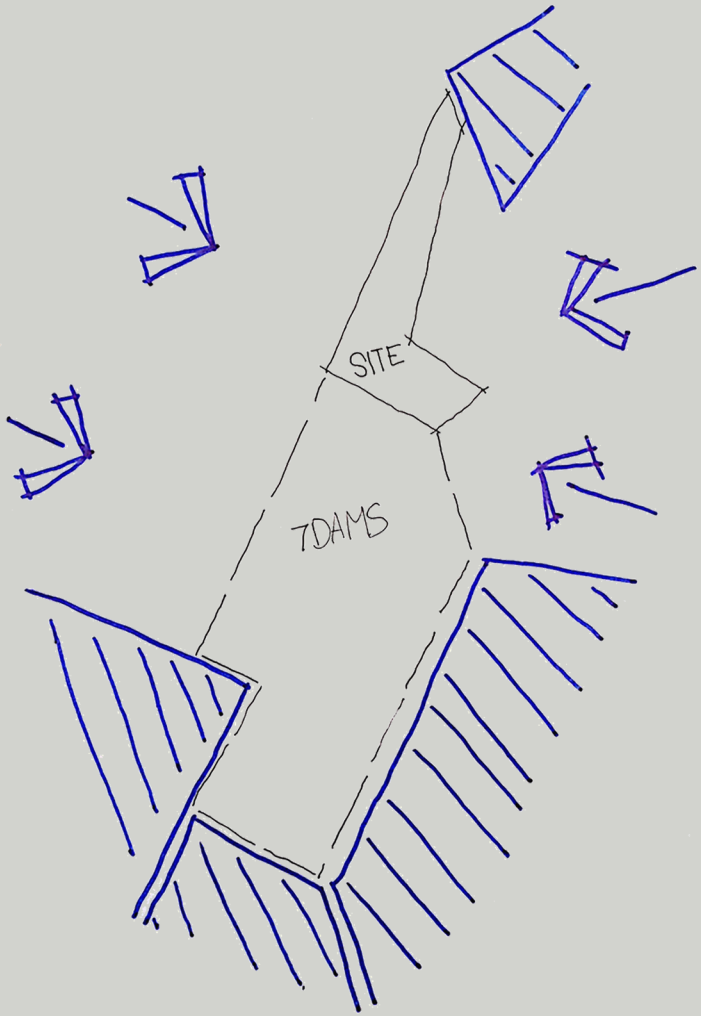
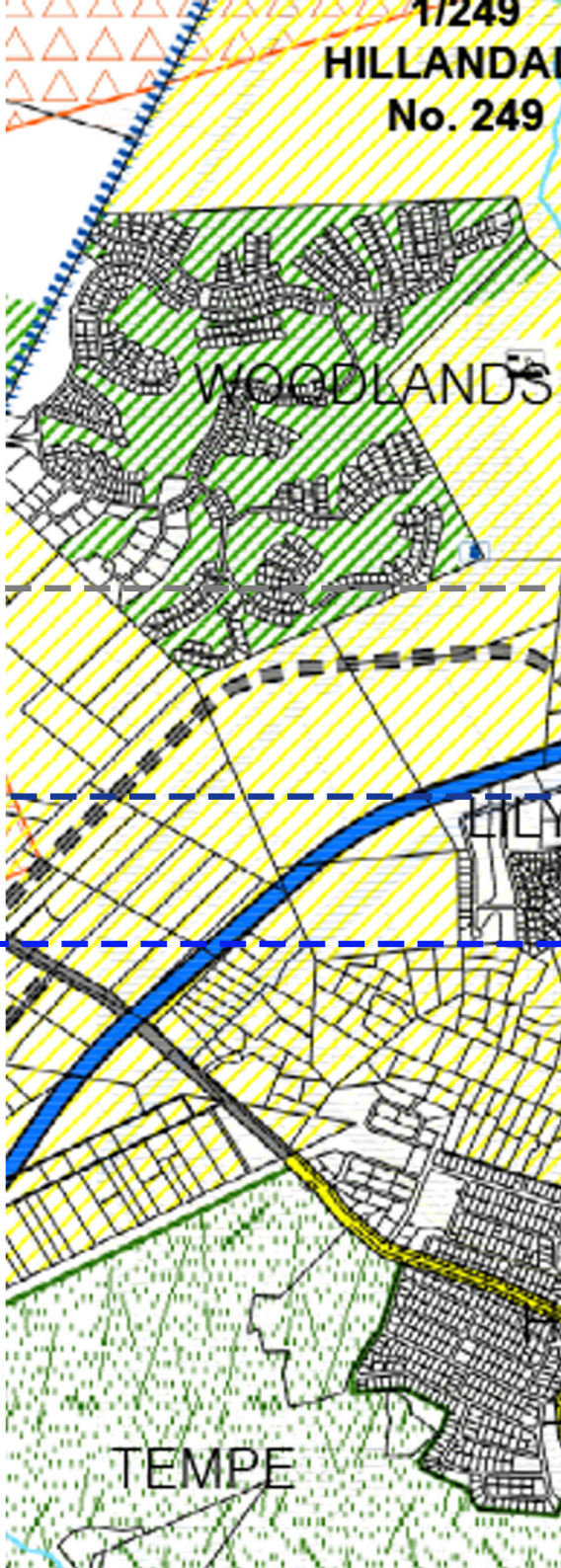


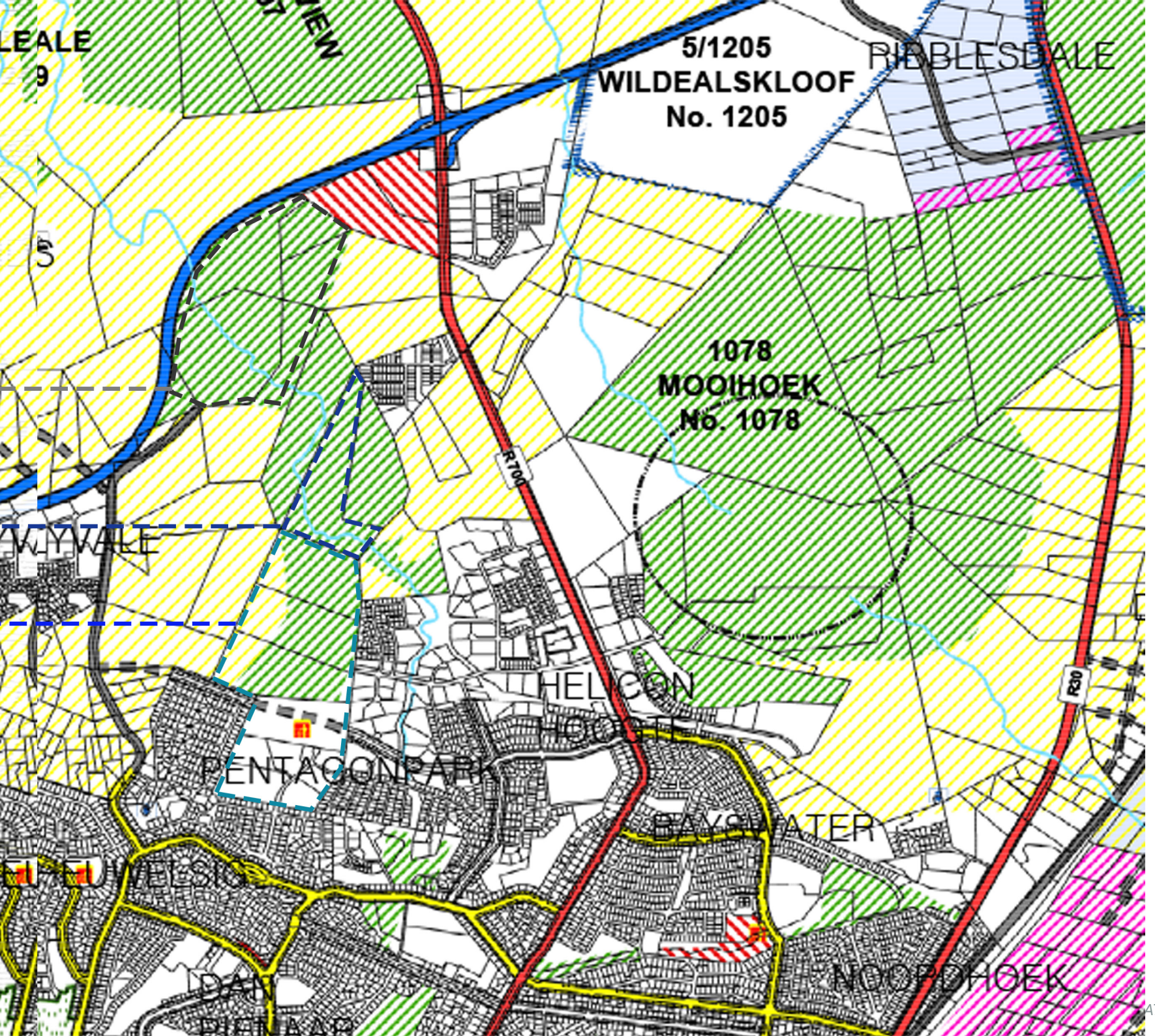
Figure 21 - *Encroaching developments.*

In order for the design to create an effective individual narrative in nature, understanding the Meso context becomes imperative. The important surroundings include the 7Dams Conservancy, the alliance the Conservancy has with the surrounding open erfs and the Botanical Gardens. Each of these elements add to the richness of the nature in the area.

The conservancy is the biggest influencer of the design. Whilst it is declared a conservancy, it is still a MOSS (Municipal Open Space System) according to the 2016 Municipal framework map. Thus it has no legislative protection, the government could sell it for development in the future. The surrounding open Erfs are privately owned, and are being developed into middle-class housing complexes one by one. Thus we see the importance of establishing a method of design in this area which will sustain the natural environment and encourage each individual narrative in nature.

Figure 22 - *Adaptation of the Mangaung municipal micro framework map of Bloemfontein, 2016. Figure indicating the increasing urban areas around the site. (P.Vorster 2019)*





LEGEND

- MMM_Boundary
- All Cadastral Data
- MMM_Rivers_50000
- Urban_edge_2016
- Water Reservoirs
- Recycling Collection Point
- National Roads
- Regional Roads
- MMM Main Roads
- Rural Roads
- Offramps
- future_roads_2016
- MMM Feeder Roads
- Development Corridor
- Petra Safety Area
- BFN_Noise_contours_2011
- cemetery_2016
- mixed_use_without_industry_2016
- mixed_use_with industry_2016
- future_residential_2016
- Green Buffers
- Moss_2016
- Diverse Development
- Nature Reserves
- Urban Renewal
- Tourism Nodes
- Institutional_2015
- Defence Force
- agricultural_node_2016
- Tempe Safety Zone
- Activity Strrip
- Urban Development Zone
- Peri-Urban Areas

PROPOSED SITE

7DAMS ENTRACES

EXISTING WALKWAYS

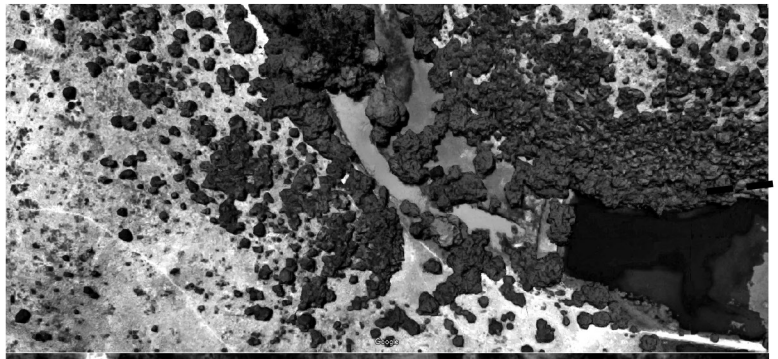
VIEW POINTS 1

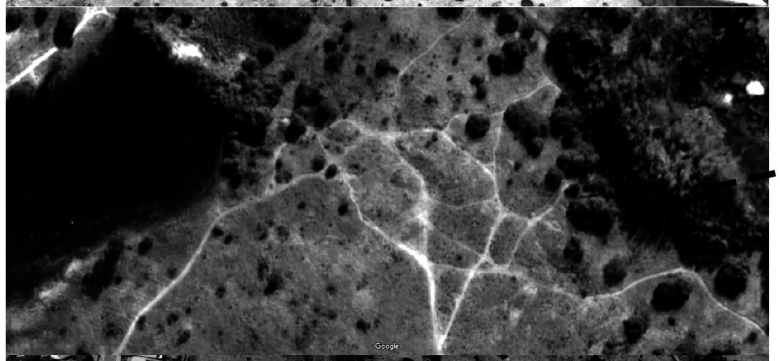
ORDERING PRINCIPLES

HUMANS

HUMANS IN NATURE

NATURE






1
2
3
4
5
6













WATER

GRASSES

ROCKS

PLANTS

Textures of Nature

Plant list

A comprehensive list of the plants in the Meso context, specifically the 7 Dams sites and the surrounding open erfs. (**Provincially protected species**)

Trees and Shrubs.

Asparagus cooperi
Asparagus suaveolens
Buddleja saligna
Chrysocoma ciliata
Clutia nana
Cussonia paniculata
Diospyros austro-africana
Euclea crispa
Euclea crispa subsp. ovata
Euphorbia mauritanica
Euryops empetrifolius
Euryops laxus
Felicia filifolia
Grewia occidentalis
Gymnosporia buxifolia
Gymnosporia polyacantha
Hermannia comosa
Heteromorphy arborescens
Indigofera alternans
Melolobium candicans
Nenax microphylla
Olea europaea subsp africana
Osyaris lanceolata
Rhus burchellii
Rhus erosa
Rhus lancea
Rhus tridactyla
Ruschia spinosa
Stoebe vulgaris
Tarchonanthus camporatus epiphyte on trees
Ziziphus mucronata

Grasses and Sedges.

Aristida congesta
Aristida diffusa
Bracharia serrata
Cymbopogon pospischilii
Cyperus congestus
Digitaria eriantha
Digiteria argyrograpta
Digiteria eriantha
Enneapogon scoparius
Eragrostis curvula
Eragrostis. lehmanniana
Eragrostis nindensis
Eustachys paspaloides
Heteropogon contortus
Hyparrhenia hirta
Isolepis prolifera
Juncus oxycarpus
Melinis repens subsp. repens
Miscanthus junceus
Pennisetum clandistinum
Pycreus macranthus
Schoenoplectus decipiens
Setaria sphacelata
Themeda triandra
Typha capensis (bulrush)

Succulents.

Aloe grandidentata
Anacampseros filamentosa
Anacampseros telephiastrum
Boophone disticha
Chasmatophyllum musclinum
Cotyledon orbiculata
Crassula dependens
Crassula nudicaulis
Kalanchoe paniculata
Orbeopsis lutea
Pachypodium succulentum
Rabiea albipuncta
Ruschia hamata
Ruschia unidens
Senecio radicans
Stapelia gradiflora
Stomatium mustellinum

Geophytes.

Androcymbium melanthoides
Albuc setosa
Boophane distichum
Haemanthus humilis

Forbs.

Artemisia afra
Cheilanthus eckloniana
Hebenstretia densa
Hebenstretia dura
Lemna minor
Pellaea calomelanos
Pentzia globosa
Rorippa nudiuscula
Rumex saggitatus

Alien plants. (Preferably removed)

Trees.

Juniperus
Populus deltoides (Cottonwood)
Populus canescens (grey poplar)
Pyracantha angustifolia
Salix babylonica (Weeping willow tree)

Cacti.

Echinopsis spachiana
Opuntia ficus-indica
Opuntia humifusa

Weeds.

Bidens bipinnata
Tageties minuta (khaki boss).

SITE HISTORY

The area to the north of Bloemfontein has, historically, been largely occupied by the military, even today the Tempe Military base still holds a significant amount of land to the North. This had been no different for Bayswater Farm in the early 1900's, where the British still had a military base in Bloemfontein during the Anglo Boer War. The area was supposedly used for grazing for the military horses and other livestock, as well as a military dumping ground. The area is as a result home to numerous structures including a large stone wall, building foundations and dilapidated livestock kraals (IMAGE). Isolated graves and graveyards are scattered throughout the area, but are found predominantly in the adjacent erfs, and are supposed to be farm workers post Boer War. A stone wall which runs across the site which is one of the last traces on the northern side of Bloemfontein of the British Military, and is thus a heritage artefact (Image).

The Area is also known to be scattered with stone age tools, but no caves or wall inscriptions have been found. The tools are common in the central plateau of South Africa, particularly along river courses. Thus, when excavating it is important to be aware of the possibility of Stone Age and War artefacts. If any artefacts are found, they are to be reported and stored in the Museums of Bloemfontein.

Figure 23 - *Section of a British Map dated 1913. This shows there are no dams in the proposed area. (L. Rossouw).*

Figure 25 - *(Left)The Historical dam wall on site which is visible from the 1941 aerial photograph. (Right) The stone wall on site, running in a north-easterly direction. (P. Vorster, 2019).*

Figure 24 - *Historical ruins in the vicinity of the proposed site (left and bellow). (P.Vorster 2019).*

FIGURE: Aerial Photograph Dating back to 1941. This gives us an idea of the "7" dams located in the area which has lead to the familiarized name for the locals. The wall specific to the building site is seen as a relatively prominent dam wall in the landscape.
On the bottom left corner we see the beginning of farm worker settlements in the are, now know as Hillsboro. (Editide by P.Vorster, 2019)

MICRO SITE

The site offers many complexities which have the potential to be problems or design tools. This specific region of Bloemfontein is particularly interesting due to the amalgamation of four distinct biomes, of which one is the Bloemfontein Karroid shrub land. This is a cluster of plants which are indigenous to the site and predominantly grow on the rocky outcrops. Usually it is defined as a protected biome, but in the 2018 Provisional Spatial Development plan, Collins declared that the Bloemfontein Karroid shrubland in this specific region, has become so fragmented due to development, it has become insignificant. Although a lot of land has not been developed, the Karroid Shrubland needs the hooves of grazing animals in order to reproduce and spread. As a result of the area becoming an island within the build environment, there are little to no animals who have the ability to sustain this symbiotic relationship, and thus the biome is slowly disappearing.
The site is an existing center where residents of Bloemfontein retreat from the concrete jungle and go for walks or runs with their families and pets in nature. Designing the project on the border of the conservancy provides an opportunity to create a retreat which is separated from the hustle and bustle of the city whilst still not creating a fantasy escapism from the real world in which one must employ the new way of life.

Figure 26 - *(top) Images from site showing the different light qualities. (bellow) Panorama from the southern hill towards the north. (P. Vorster, 2019).*

The sites most beautiful attribute is that of its diversity. The different biomes seem to come to a meeting of consent here. The large woody shrubs create this tiny little piece of Romance in the Classical landscape the Free State is so well known for. But more than this, the large, caof large old trees, is abutted by different biomes on either side. Towards the slope, the shrubland shows off its harsh personality with hardy shrubs working their way through the dolerite rocky outcrops. On the northern side, we find a grassy freshwater wetland, which is occasionally flooded with runoff and is covered in tall grassy plants, opening to the heavens. And here, in-between the heavens and the rocks we find a little forest which protects the wall and the water. It protects and hides so as to not be disturbed.

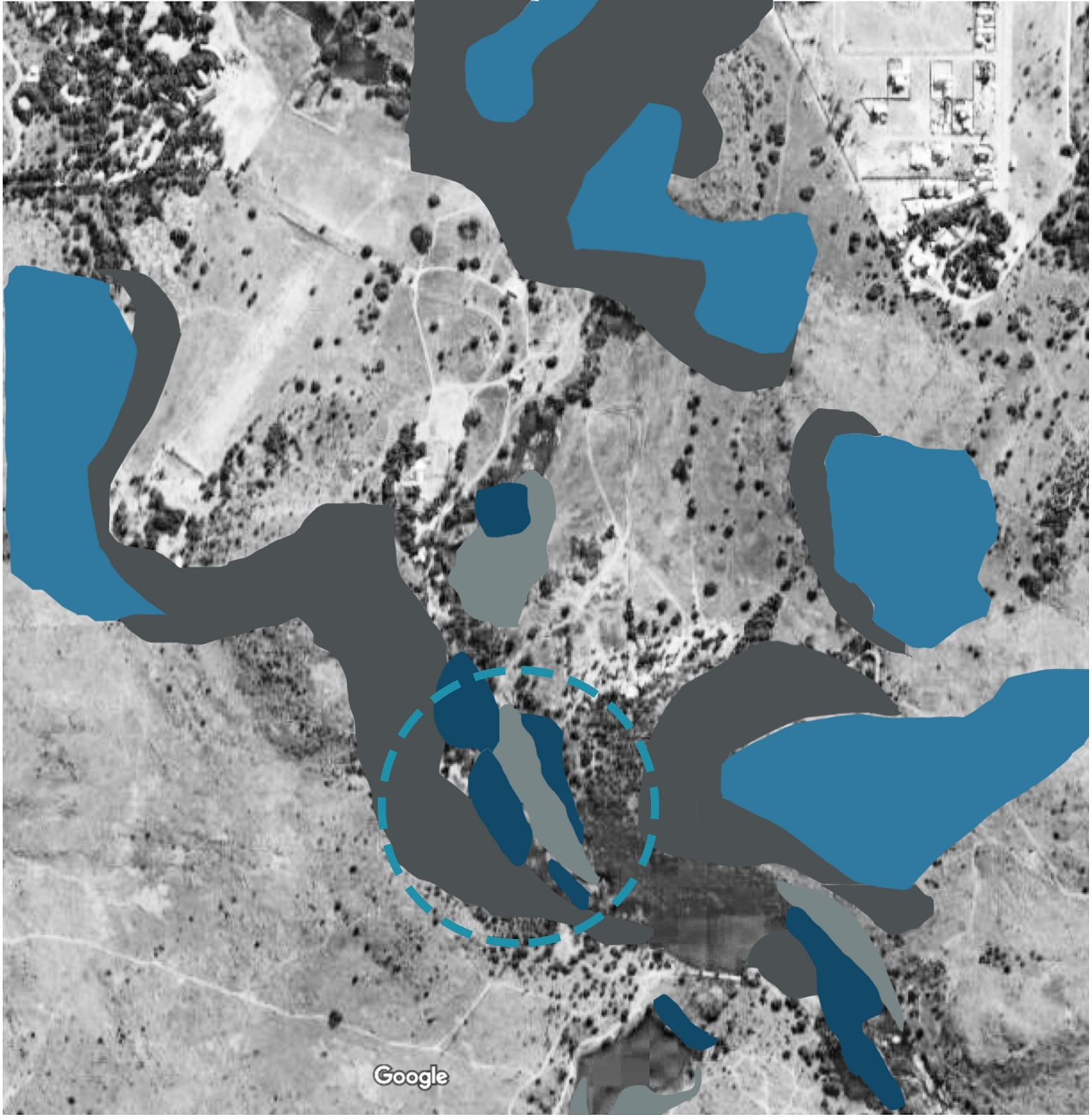


Figure 27 - *Map indicating the different biomes around and on the site (indicated). (P. Vorster, 2019).*

Discovering the romance of a wonderfully shady green forest canopy is rather unusual in the dryer climate of Bloemfontein. The specific canopy the design will settle under is a mixture of both indigenous and exotic trees. The surrounding biodiversity ranges from grasses to aquatic plants, all of which have taken to the stream bed and use the water as a source of life. The water becomes the concrete foundation for life, on which this ecosystem is built.

INVASIVE GRASS

PENNISETUM CLANDISTINUM
(KIKUYU)

TAGETIES MINUTA
(KHAKI BOSS)

FORBS

OSYARIS
LANCEOLATA

ZIZIPHUS MUCRONATA

EXOTIC TREES

POPULUS CANESCENS
(GREY POPLAR)

JUNIPERUS SPECIES

CUPRESSACEAE
WIDDRINGTONIA

PYRACANTHA ANGUSTIFOLIA

SALIX BABYLONICA
(WEEPING WILLOW TREE)

POPULUS DELTOIDES
(COTTONWOOD)

INDIGENOUS TREES

OLEA EUROPAEA
SUBSP. AFRICANA,

BUDDLEJA SALIGNA,

OSYARIS
LANCEOLATA

ZIZIPHUS MUCRONATA

GYMNOSPORIA BUXIFOLIA

GYMNOSPORIA
POLYACANTHA.

SUCCULENTS

DUVALIA CORDEROYI

ORBEOPSIS LUTEA

STAPELIA GRADIFLORA

SENECIO RADICANS

CRASSULA NUDICAULIS

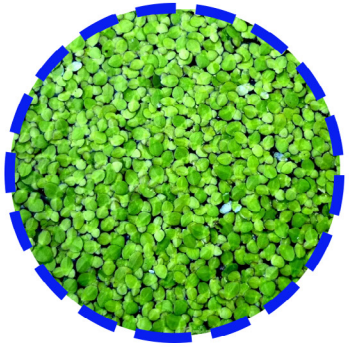
COTYLEDON ORBICULATA VAR. DACTYLOPSIS

AQUATIC PLANTS

COTYLEDON ORBICULATA VAR. ORBICULATA

KALANCHOE PANICULATA.

TYPHA CAPENSIS (BULRUSH)



LEMNA MINOR (DUCK WEED)

CYPERUS CONGESTUS

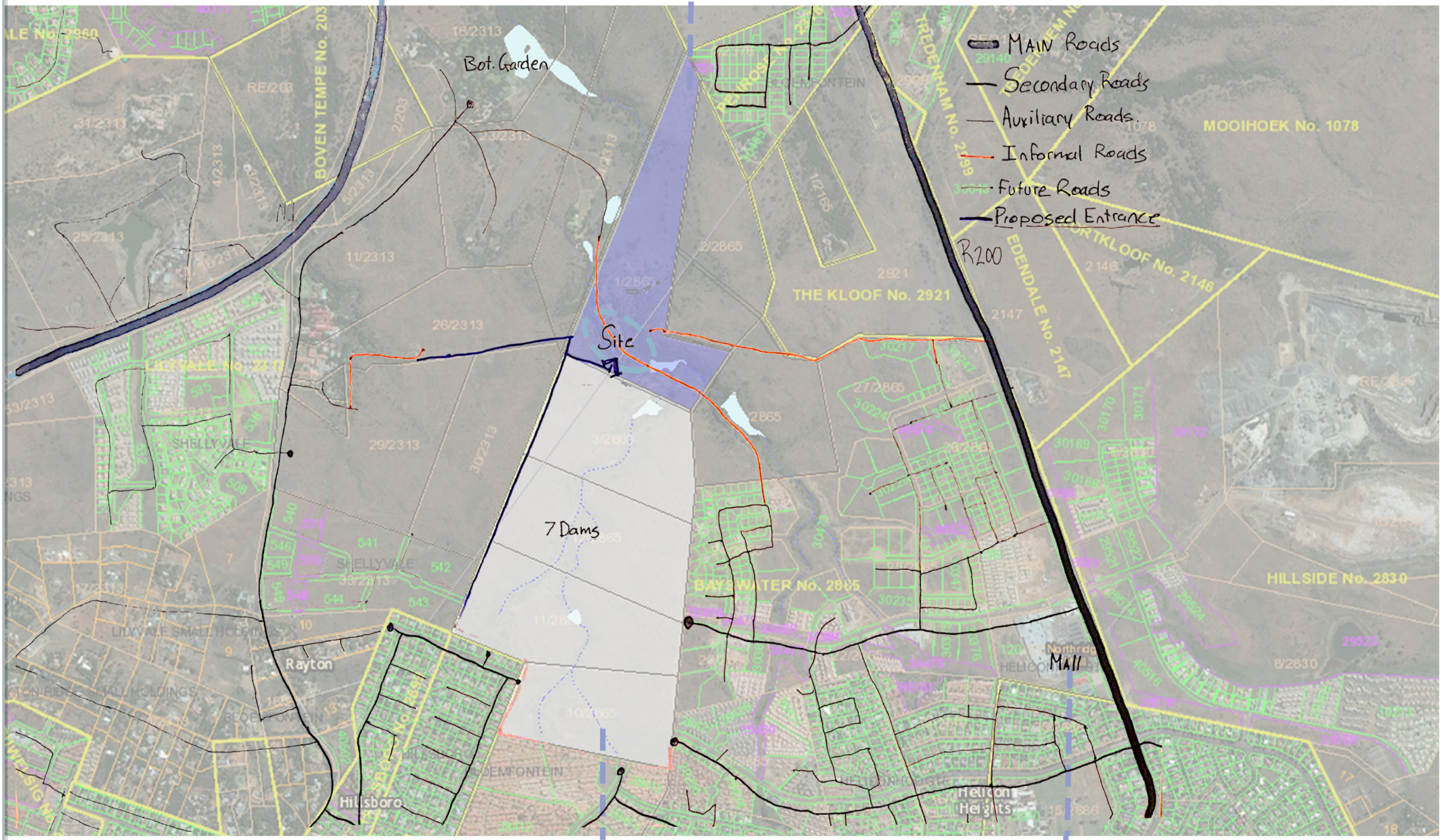
PYCREUS MACRANTHUS

SCHOENOPLECTUS DECIPIENS,

HOLLOW STEMMED ISOLEPIS PROLIFERA

Figure 28 - *Basic North South site section showing plant type placement. (P.Vorster 2019)*

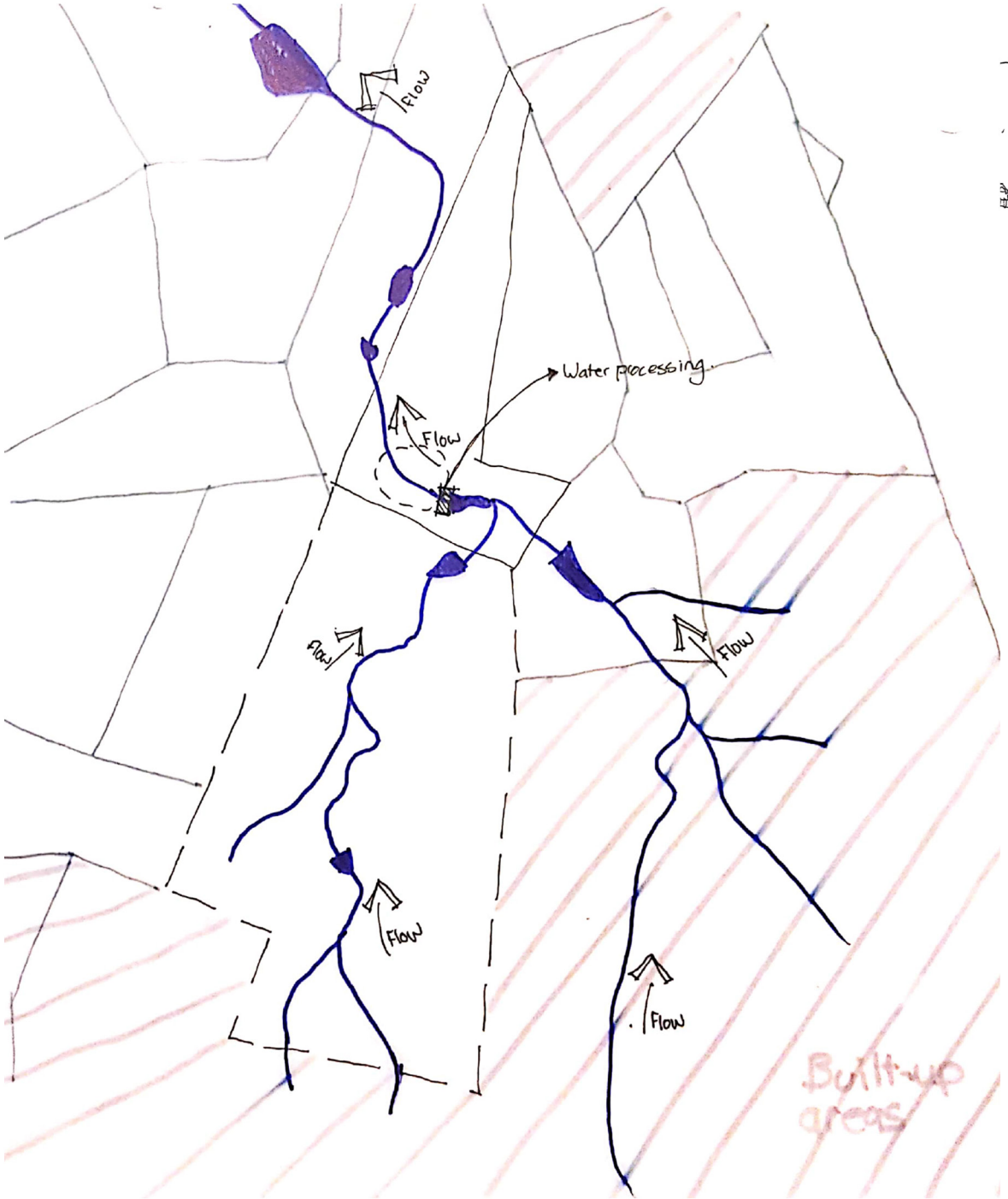
N1 PROPOSED SITE



7 DAMS CONSERVANCY

NORTHRIDGE MALL

Figure 29 - *Map indicating the existing roads and the new proposed site entrance. (P. Vorster, 2019).*



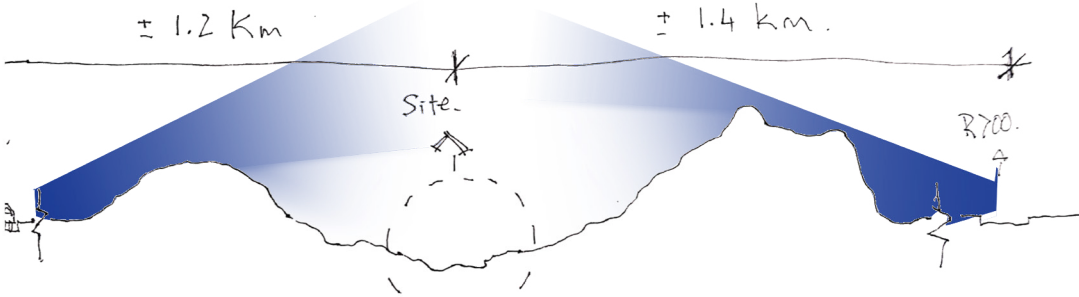


Figure 30 - *(left) locality plan of the stream arterial and their poor quality water catchment areas in the built-up areas. (above) Illustration of noise travel from the two busy main roads. (P. Vorster, 2019).*

SITE PICTURES— SHOWCASING ELEMENTS OF CONSERVATION

EXISTING DAM WALL

HANDMADE DAM WALL AND WATER WAY

EXISTING STRUCTURES

SITE PICTURES— SHOWCASING THE CHANGE IN VEGETATION

NORTH EAST VIEW

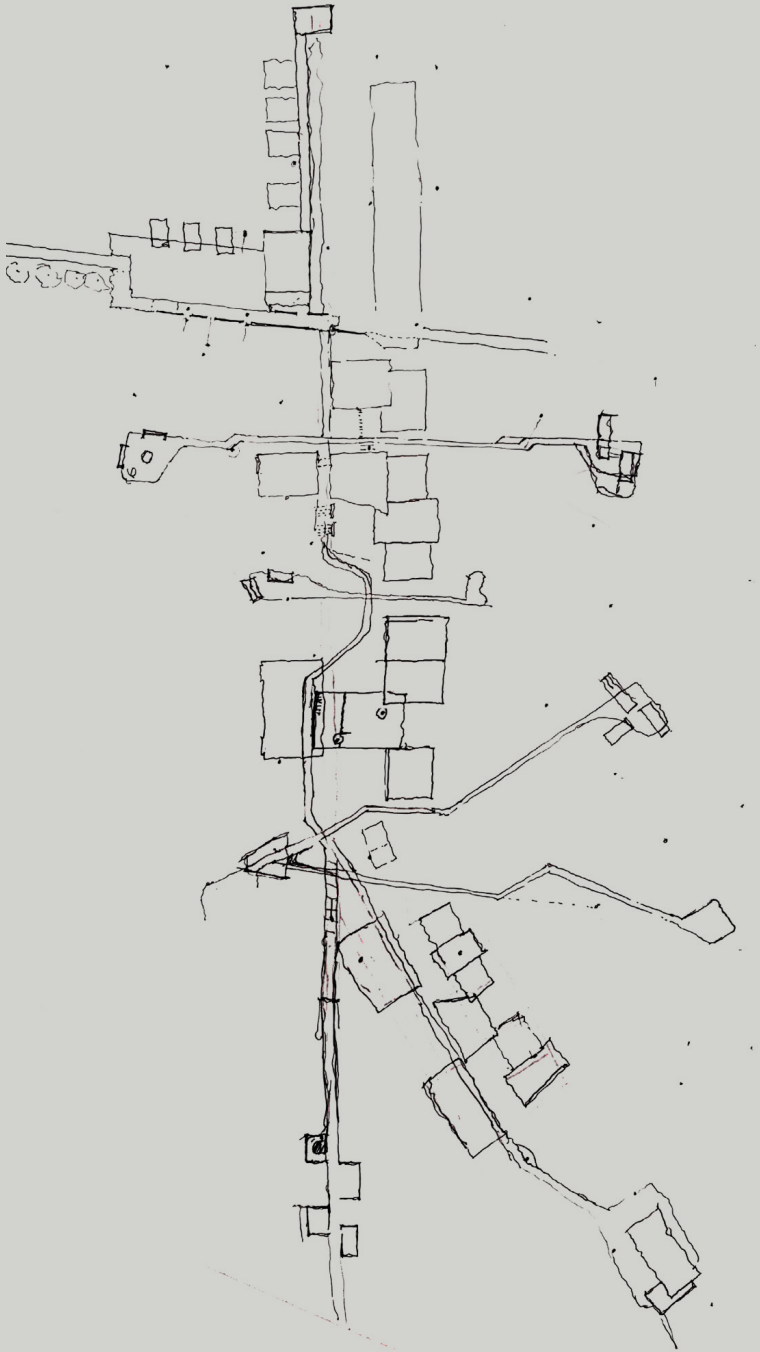
NORTHERN VIEW

EASTERN VIEW

MORPHOLOGY

THEORETICAL DISCOURSE

Liminality is the conscious state of being within the boundary of two different states. Anthropology defines liminality as the disorientation or ambiguity which occurs when experiencing the in-between. Within the limien, one must form new methods of thought and action which become recognized as their new self post-liminal (Thomassen, 2014, p. 113). Devolving a water fasting centre which encourages the growth of the self throughout the liminal phase, must understand the concepts associated with liminality and the actions which could form a new self.

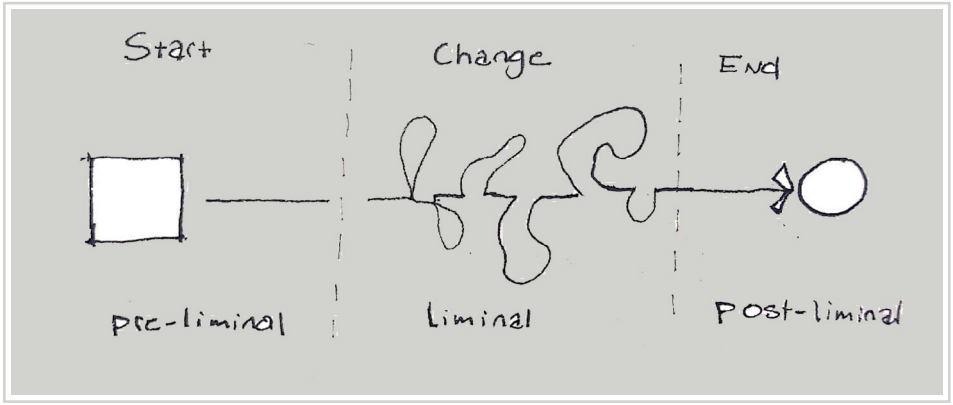


RITUAL

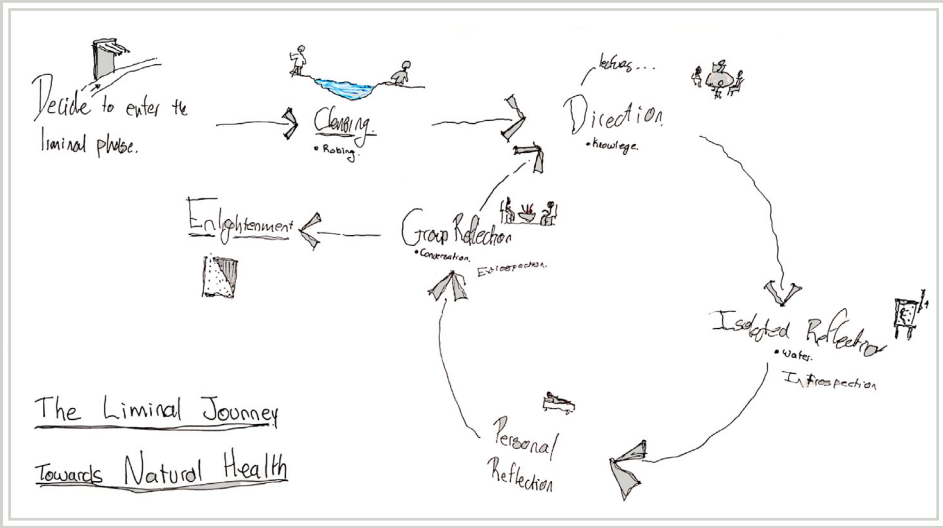
"The cosmology has always been destabilized, and society has always had to make efforts, through both social dramas and esthetic dramas, to restabilize and actually produce cosmos."

Victor Turner, By Means of Performance, 1990, pg. 18.

Liminality and ritual are intertwined, liminality forms the change within ritual, while ritual informs the change within the liminal phase. Victor Turner studied rituals and social dramas (change in the norm, both positive and negative) in order to grasp and understand the embodiment of the liminal. Turner states that the ritual within a liminal phase, say marriage or death, becomes the mechanism in which humans 'deal with' the social change or drama (Turner, 1990:10). Dramas in turn define the being and are essential in growth and development. Experiencing a change in ones state of health, or dietary preferences, through water fasting, the body and self undergo a social drama. The drama becomes the in-between of two points in time, defining a beginning and an end. The liminal (the fast) requires a ritual in order to assist a being within the liminal, overcome the change and develop a new being of self. The liminal ritual is not linear, nor vertical, but an intertwining of different influences where the persona adapts to endure personal experience and growth (Seale-Collazo, 2012).

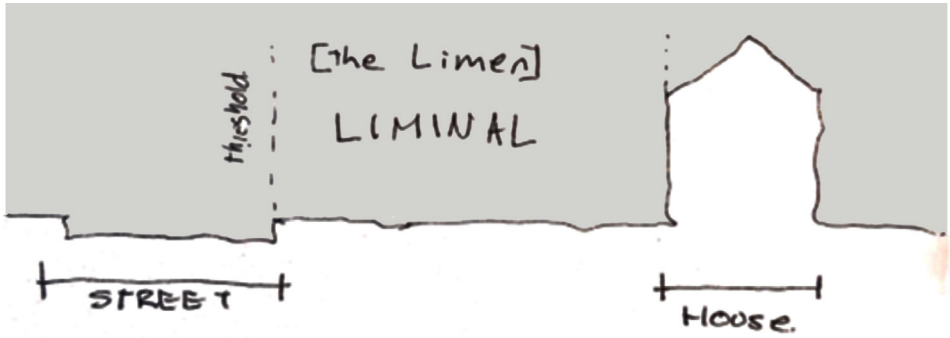


The proposal endures this ritualization of the fasting liminal. Clients enter the liminal and undergo a ritual of knowledge and reflection. Knowledge becomes the directive of reflection, received in the form of lectures. Clients will experience daily lectures covering a broad spectrum of subjects, after which different methods of reflection can occur. These moments of reflection offer a space in which the individual can contemplate the future and deduct the knowledge they wish to build their new selves upon. These moments are experienced in different levels of intimacy. Introspection of the self is in the form of isolated reflection areas such as a float room, a sauna or warm baths. Personal reflection occurs within the living room of the residential units. Units offer a space in which clients at a similar stage of the liminal can interact and discuss knowledge on a personal level. Group reflection derives from the activities throughout the day, such a gathering around a fire pit, gardening or art. Thus the ritual of change occurs daily, but the individual resolves their own form of reflection.

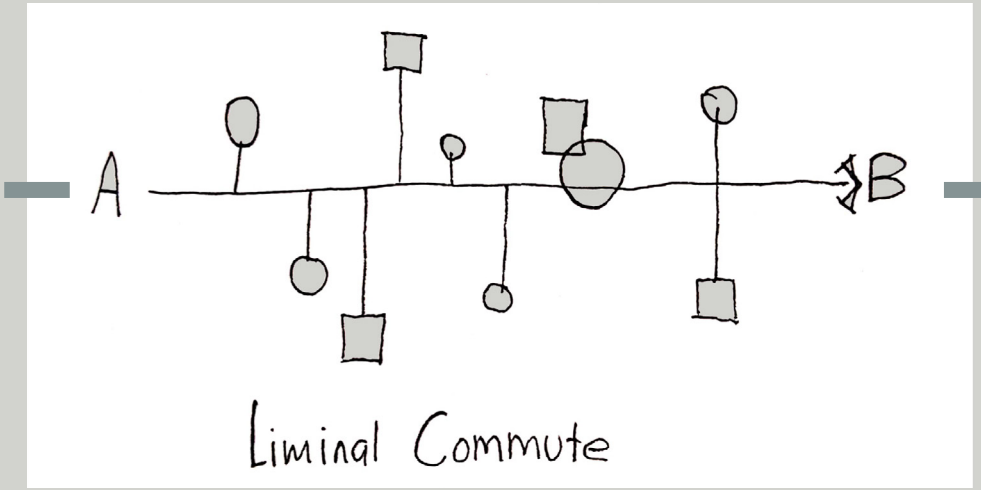


THRESHOLD AS A JOURNEY

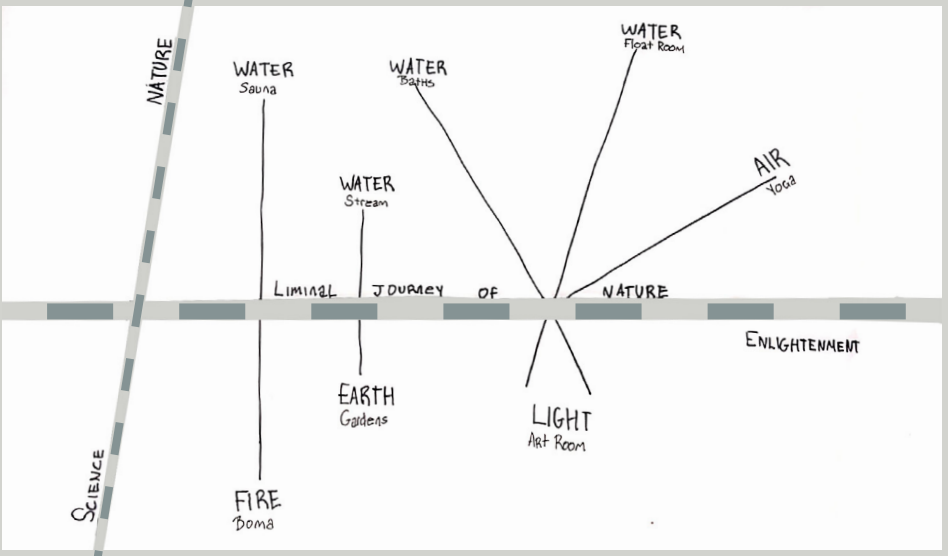
In architecture the liminal could be seen as a threshold, equally within a room and out of it at the same time. Being neither here nor there. Elongating a threshold could prolong the liminal phase, such as the space between a boundary and a house, where one is no longer on the street but not within the house. This space, the limen, becomes the collision of rituals, where the social laws of the public sidewalk and private rules of the home become intertwined and lost (Ascott, 2017). In this lost space of ambiguity, a freedom evolves where the rules of the past (sidewalk) and the future (the home) become blurred separated and abstracted, leaving the person within the liminal to derive their own temporary laws and norms.



Whilst threshold is commonly defined as a doorway or the verandah of a house, a passage is as much a threshold. A passage way is the liminal phase in which one arrives before choosing which space to enter. This commute serves as the transitional phase between one realm and the next, such as the commute to work. At home one is a mother/wife/partner, while within the work place, defined as an architect/boss/co-worker (Wilhoit, 2017). This journey is seen as a state of liminality, the non-place between destinations. Enduring the liminal passage offers opportune encounters where the persona decides to engage, or not. These decisions on where to engage, uniquely defines the liminal commute for each person. Undergoing momentary encounters along a liminal journey encourage the ritualization of the liminal, growing the individual through layering of experiences (Ascott, 2017).

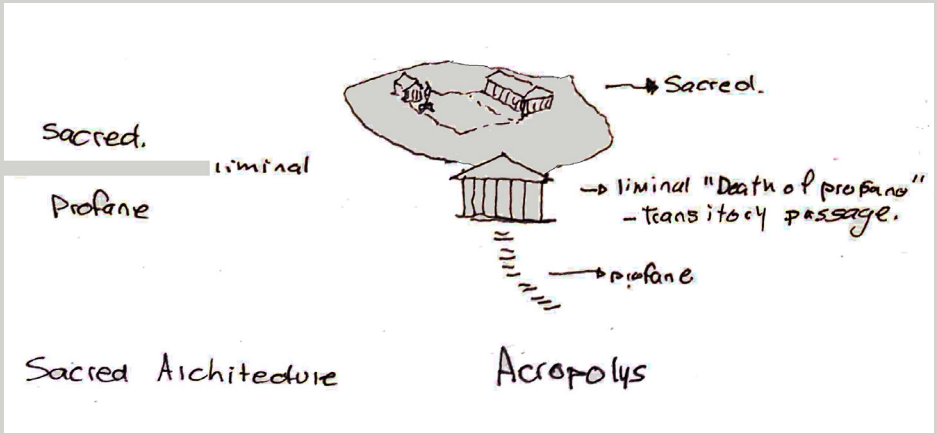


The design is structured around pathways and journey. The influence of the journey derives from the existing rituals at play on the site. The 7 Dams Conservancy is a semi-public park in which users journey through nature, as a liminoid, from their daily city lives. The existing ritual of the individual's narrative within nature guides the design to incorporate nature throughout the proposal. The use of the pathways divides the building into smaller fragments, within the natural landscape, along which the client can explore. Thus, the user can decide to follow pathways toward different experiences or not. The liminal persona thus creates their own personal exploration of the proposal and of nature. Whist the central path leads to a space of meditation, the auxiliary paths lead toward spaces of natural contemplation.



CLEANSING OF THE PAST

Religious architecture defines the liminal phase as the transition from the profane, or impure, to the sacred and pure (Lewis, 2008). The liminal phase becomes a cleansing ritual in which the space provides a threshold for cleansing to occur. A roman catholic church incorporates the liminal in the form of holy water which washes the profane upon entrance into the church, symbolizing the death of the past self, and birth of a sacred self. The Acropolis' liminal transition becomes far more embodied through the architecture itself. The profane approach the Acropolis via a steep route, in which the past becomes forgotten (pre-liminal – the death of the past) before entering the liminal phase. The Propylaea thus embodies the liminal state of transition. Here the building acts as the threshold of the profane to the sacred, forming the liminal space in which the profane leave their impure ways and move toward a pure self within the sacred space (Lewis, 2008).

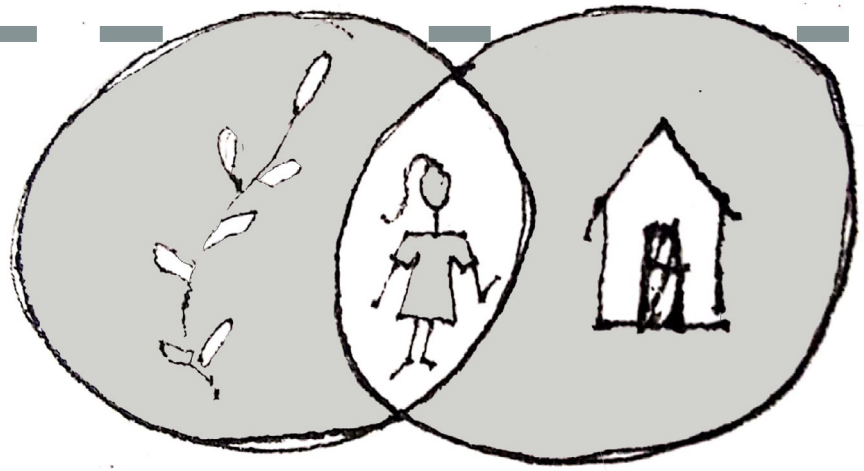


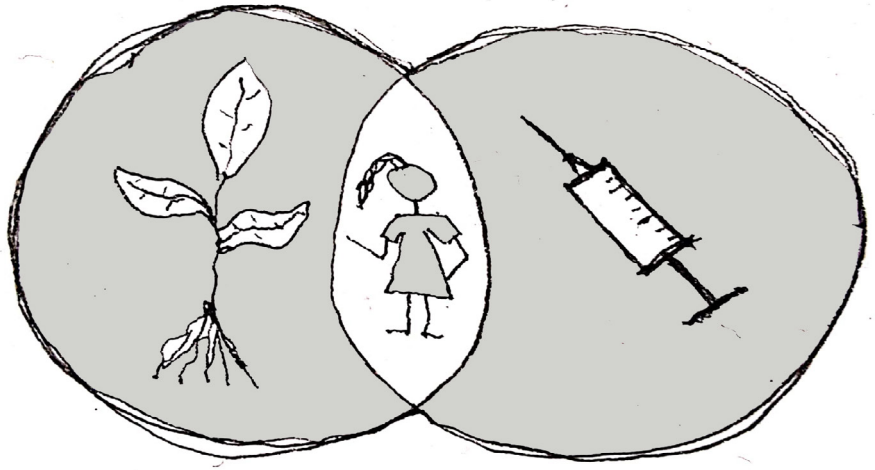
Upon entering the center, a client undergoes a cleansing ritual as a symbolic death of their past ill health or impure ways. This ritual is in the form of a cleansing tank. The client removes their attire, physically leaving their past behind, and then descend into a pool of water. The water becomes their momentary cloth as, the sky opens above, while fallacies of the past are washed away. Once cleansed, the client robes themselves and enters the comunitas (a group of beings in the liminal state). Being robed within the liminal further encourages the falling away of normative boundaries and structures, such as status, class and hierarchy, resulting in a space in which focus on self and healing can be prominent.

PHENOMENOLOGY

Liminality calls for a study of the structure of experience. Phenomenology refers to the experience of the human consciousness. Martin Heidegger, in the text Being and Time (1927), observed that 'Dasein', being-there, as a human cannot be separated from the world. Consequently, a being within a landscape produces a 'person-world'. Dwelling within this world becomes the purpose of living, epitomized by the 'fourfold' representations of a being as a part of nature. These natural representations occur in the form of earth, sky, divinities and mortals. Thus, in order for a being to dwell with a definite experience of the world, the relationship between man and nature should be nourished. A dwelling (a space of knowledge) thus nurses' nature (elements of growth) and that which is built (elements of non-growth, but construction) (VonderBrink, 2007). Hereafter, we can deduct that the purpose of architecture is to dwell within nature, drawing an interlaced experience of the built and nature, where the being can experience the 'person-world'.

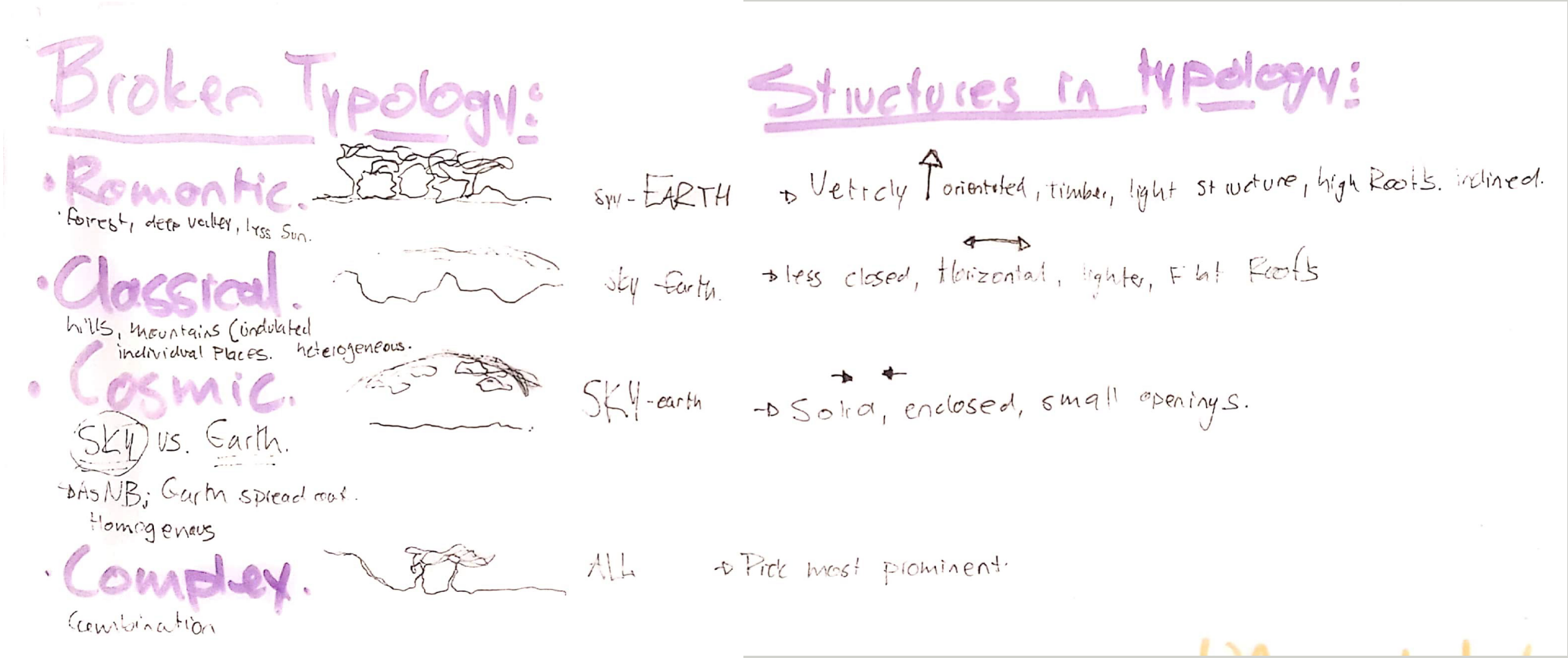
Architecture serves a beings' thinking and dwelling by embracing the 'genius loci' of a site and make it a place, constructing the felt meaning of the perceived existence. Thus the being can live between the sky and the earth, as they live between the walls and the roof of the architecture (Sharr, 2007). Therefore, dwelling becomes the liminal between nature and building, earth and sky and the roof and the wall. The agent of concern within the project is thus building these liminal spaces of experience in which nature and the closeness humans desire to it (Biophilia) can be lived. The Fasting Center draws a similar link in its proposal, but not only man between nature and building, but that of man between nature and science too.





Norberg-Schultz established typologies based on the phenomenology of natural spaces, based no light, circadian and seasonal rhythm and spatial character. The typologies are four-fold, where an appropriate architectural action to each landscape is suggested (Farshadi, 2017). The first of the landscapes is that of the romantic landscape (earth dominanted over the sky, forested). The seccond a classicle landscape where the earth and the sky are in harmony (undulated hills and individual spaces) wihile the third is where the sky is dominant, in the cosmic landscape (desert). The fourth is where the disertation finds itself, within a complex landscape, an amulgimation of the landscapes, where the earth and the sky compete.

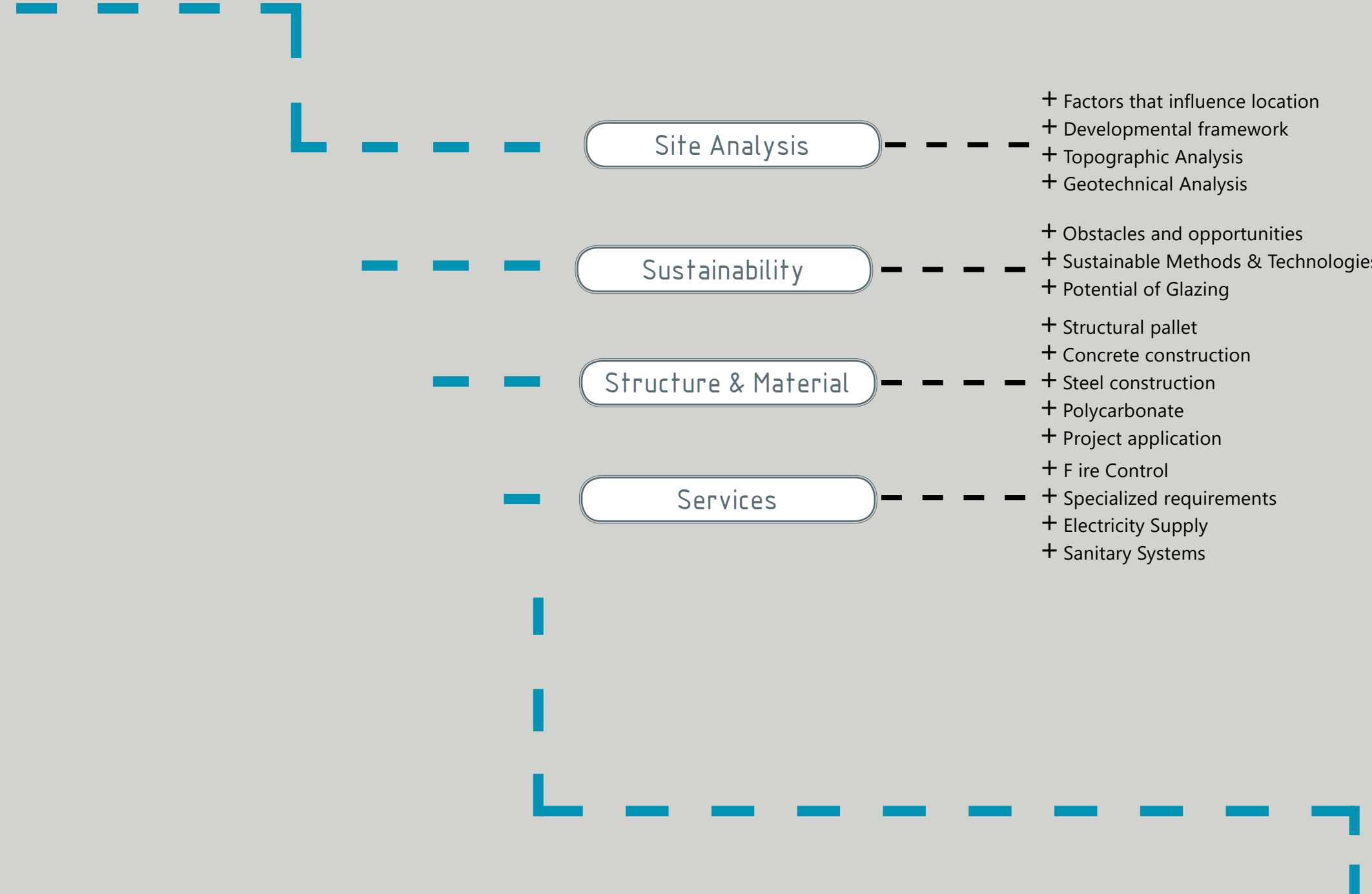
Each topology finds a inherint typology in which beings dwell, generating diferent exparienes of nature by the being. Within the complex landscape the dwelling should become the typology through which the existing genius-loci can reside and find comfort, through an apropriate combinatio of the proposed typologies.



PART 4 TECTONICS

TECHNICAL DEVELOPMENT

Figure 31 - *Macro locality plan.*


Site Analysis
+ Factors that influence location
+ Developmental framework
+ Topographic Analysis
+ Geotechnical Analysis
Sustainability
+ Obstacles and opportunities
+ Sustainable Methods & Technologies
+ Potential of Glazing
Structure & Material
+ Structural pallet
+ Concrete construction
+ Steel construction
+ Polycarbonate
+ Project application
Services
+ F ire Control
+ Specialized requirements
+ Electricity Supply
+ Sanitary Systems

1 — SITE ANALYSIS

FACTORS THAT INFLUENCE LOCATION

Picking a suitable site for a Water Only Fasting Retreat has proven more difficult than expected. Typically retreats are placed in a landscape which have close to no visual connections to our urban lives, focusing on nature as a biophilic relaxer, thus using nature as well as its elements to enable patients to relax and feel closer to nature (Rubridge, 2017). Typically, from case studies, water only fasting centers are placed within the urban environment so that there is an ease of accessibility to the center. This accessibility refers to both the urbanites' access to the center as well as the centers accessibility to existing medical facilities within the urban environment. The medical facilities and the center work in a symbiotic relationship, where ill patients who wish to use the water fasting program as a healing tool can easily be admitted and directed, while the fasting center uses the hospital for medical laboratory testing for patients with specific needs.

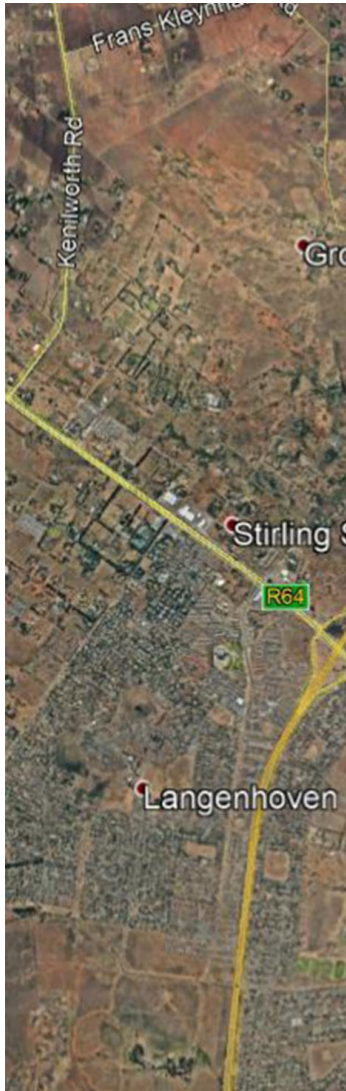
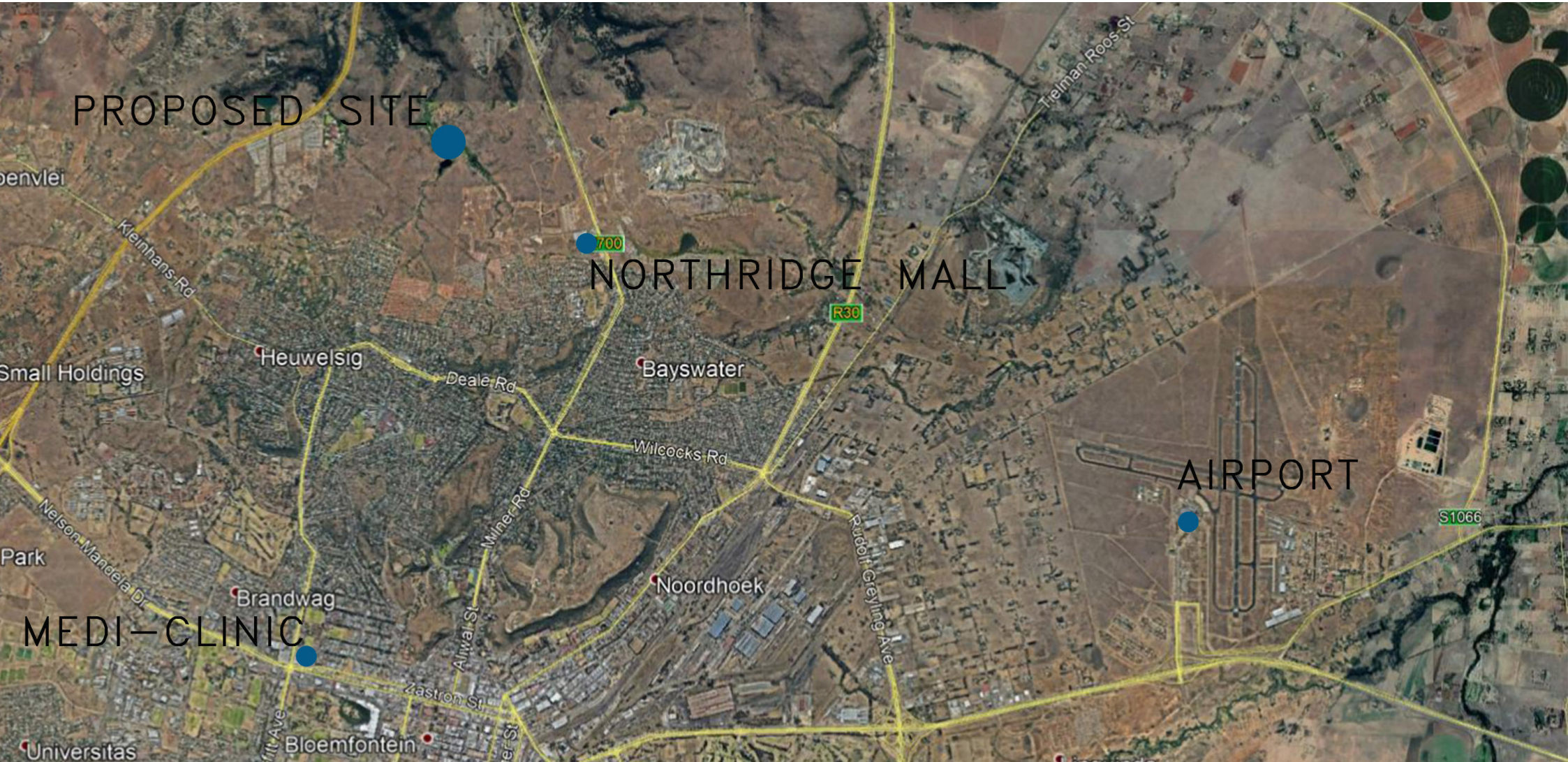


Figure 32 - *Locality Aerial Map.*

1.1—PROPOSED LOCATION

For the above reasons, the selected site is on the periphery of the Bloemfontein City, close enough for shorter weekend fasts or educational talks for local residents, but also in a quiet and calm area with clear visual links to nature and a closeness to its potential. Being the periphery of the city allows for closeness to nature, whilst still having accessibility from the airport and medical facilities. The proposed site (Erf. 1/2865) is adjacent to the 7 Dams conservancy to the north of Bloemfontein (Figure 2). Whilst running route and adventure paths exist through the site, it is not a part of the Conservancy itself. The owner of the farmland is a keen supporter of the 7 Dams conservancy (Krynauw, 2019).



1.2—DEVELOPMENTAL FRAMEWORK

1.2.1—CADASTERAL INFORMATION

Cadastral information refers to information which is specific to the proposed site and creates the boundaries and framework in which the design is developed. These regulations or geographical measures range from legislation to physical condition on the site.

The proposed site is a farm portion as follows:

SITE INFOMATION	
• **Erf number**	Portion 1 of Erf2865
• **Home Farm Name**	Bayswater
• **Description of corner beacons**	A - Iron bar in cement block
	B – Wooden corner fence post in stone wall
	C – Iron peg in cairn
	DEF – Iron bar in cairn
• **Property area**	28.52 ha

Figure 33 - *Table of site information*

SG DIAGRAM

Full farm SG diagram

Showing all sub-divisions of Farm Bayswater, including the proposed site, portion one. Seen on the northern side, an 'L' shape.

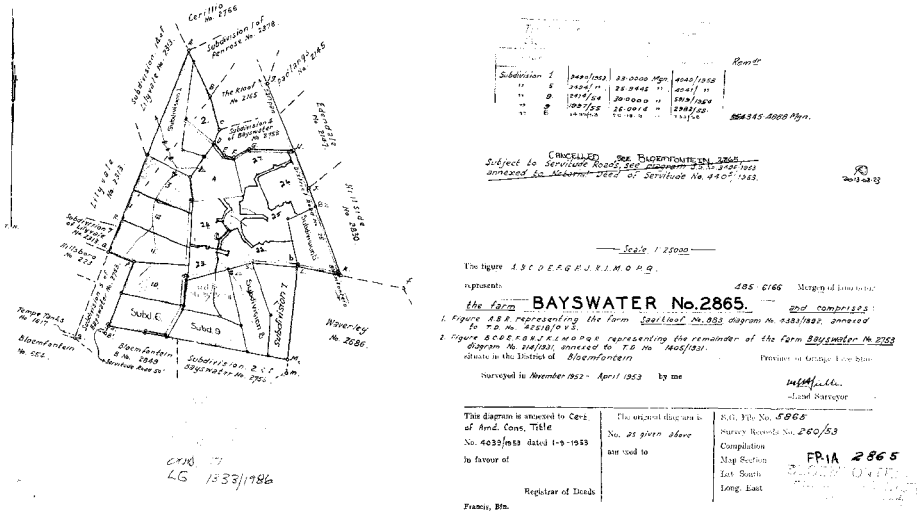
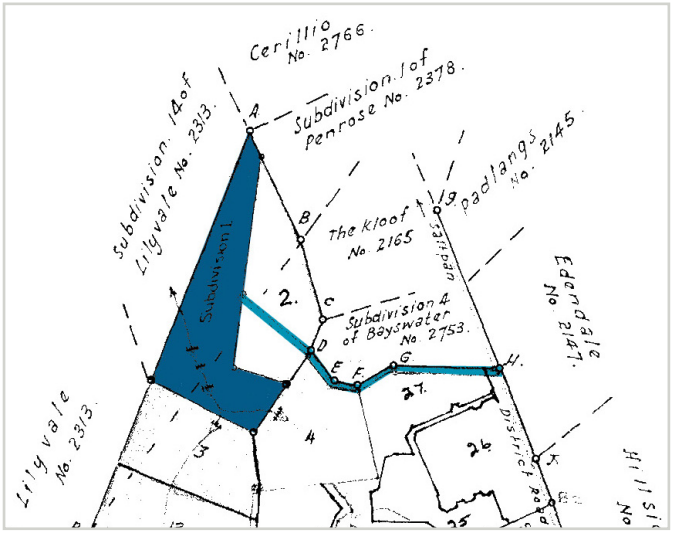


Figure 34 - *Full Baywater Farm subdivision Diagram. (online, csg.dla.gov.za)*

Site SG Diagram

The project site is the first subdivided portion of the home farm (As seen in dark blue on figure 7), Bayswater. There are no passing streets and thus a servitude is used for access as seen in light blue bellow (refer to Servitude Diagram in apendix).



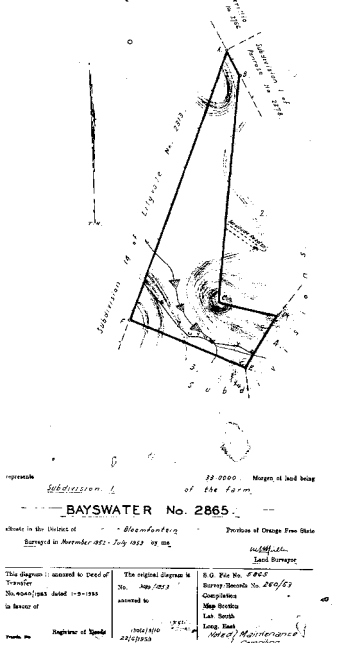


Figure 35 - *LEFT- Portion 1 (dark blue) and servitude(light blue)*
Figure 36 - *RIGHT-Surveyor general site topography. (online, csg.dla.gov.za)*

1.2.2—DEVELOPMENTAL RIGHTS

ZONING & OCCUPATION CLASS

The proposed site is zoned as "undetermined" zoning, with a proposal of Metropolitan Open Space System (MOSS) as of the 2017 Mangaung report (Figure 15). This implies that the site has the potential to be either private or public development (Mangaung, March 2017).

MOSS	Permit the following land uses; public and private open spaces	Along the Free State Botanical Garden, as well as on the eastern side of the infill site and mining quarry

The design proposal for a retreat falls under E4 occupation (SANS 10400 A20 Table 1), a medical facility which is a common place for long term or transient living for a number of unrelated persons, due to varying degrees of incapacity, are provided with personal care services or are undergoing medical treatment. This requires a maximum population of 12 people as long as there is not more than 4 patients per room.

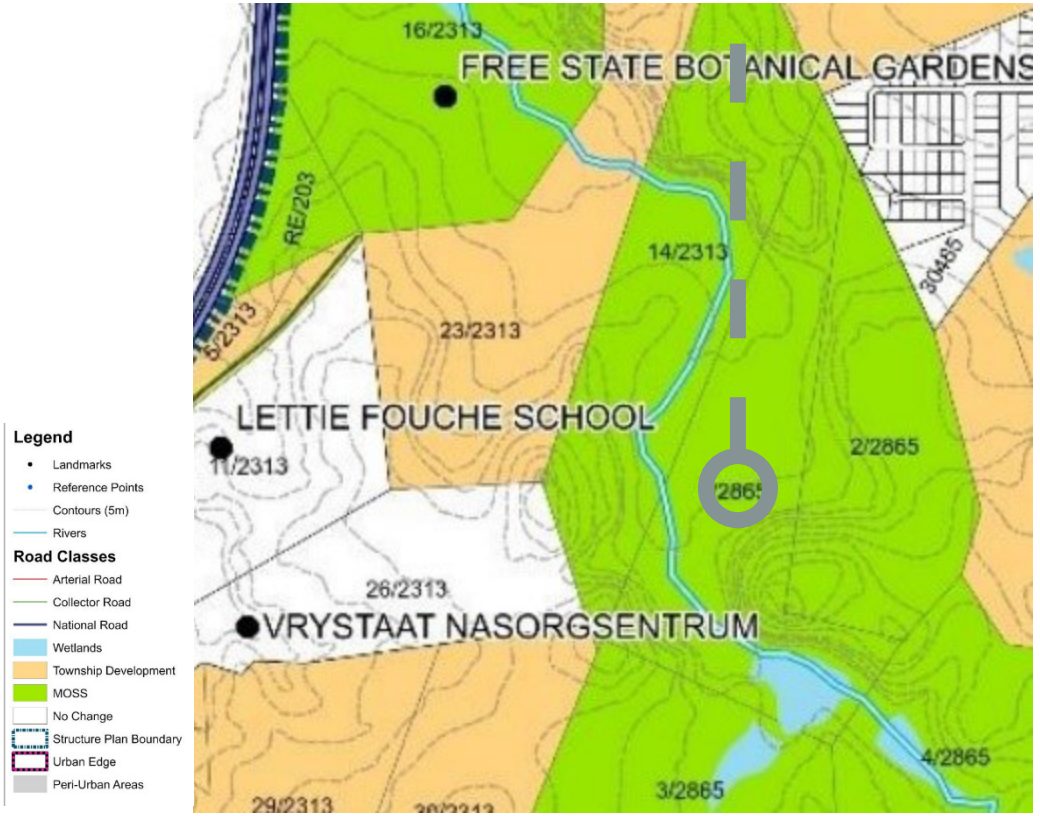
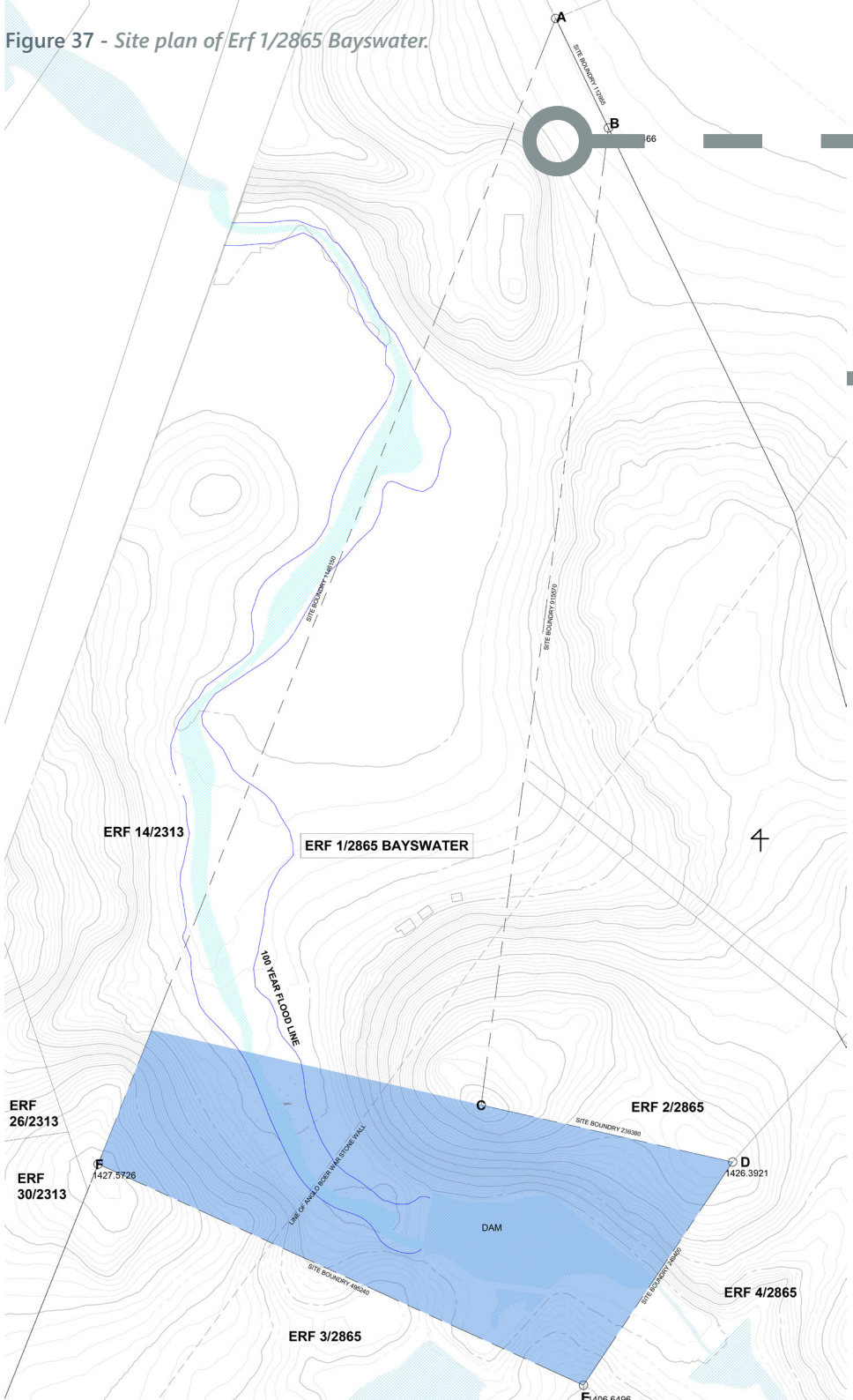


Figure 37 - *Site plan of Erf 1/2865 Bayswater.*



SITE PLAN

The proposed site is Erf 1/2865, Bayswater, Bloemfontein, a farm portion of 28.52 hectares. The proposed development will be on a subdivision of the site, where the project will reside on the southern portion, as indicated in blue in Figure 16.

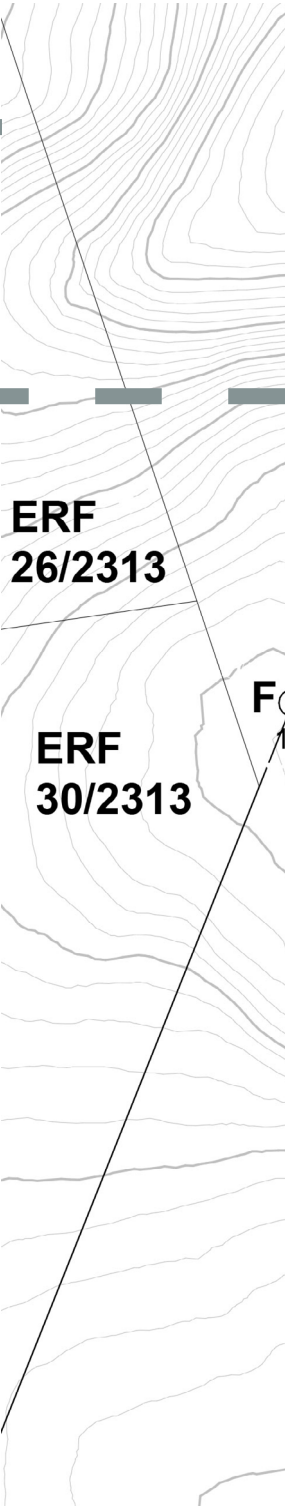
PROPOSED SUBDIVISION

In order to receive approval for subdivision, municipal documentation will be required for consent to subdivide along with approval from the surrounding landowners. A professional registered land surveyor is employed to physically survey the subdivision and erect the new beacons. The proposal will need to be advertised in the public papers and adequate signage around the site will be needed.

This is a lengthy process, but as the original erf is privately owned it will be much faster than a municipal property. As the land is now considered as part of the Bloemfontein Metropolitan Open Space system, agricultural impact can be assumed to be uninfluential, especially as it is currently unused as a farm.

A town planner will need to be employed for the design and approval of access roads (iLead, 2018). The existence of servitudes may make this easier, especially as adjacent Erfs are in the process of being developed and road placement is being approved. Assuming the Subdivision is approved by the municipality the proposed design will be on the following portion.

The proposed site portion for the design is 9.75ha. The existing erf will be split with a continuation of boundary line CD until it is perpendicular to boundary line FA, thus creating beacon 'G' as indicated bellow. The proposal will include the larger of the dams within the "7 Dams" vicinity. The design will be placed within the valley along the riverside, taking into account the flood lines. Facing North East, the design can take full advantage of natural heating and lighting throughout the design.



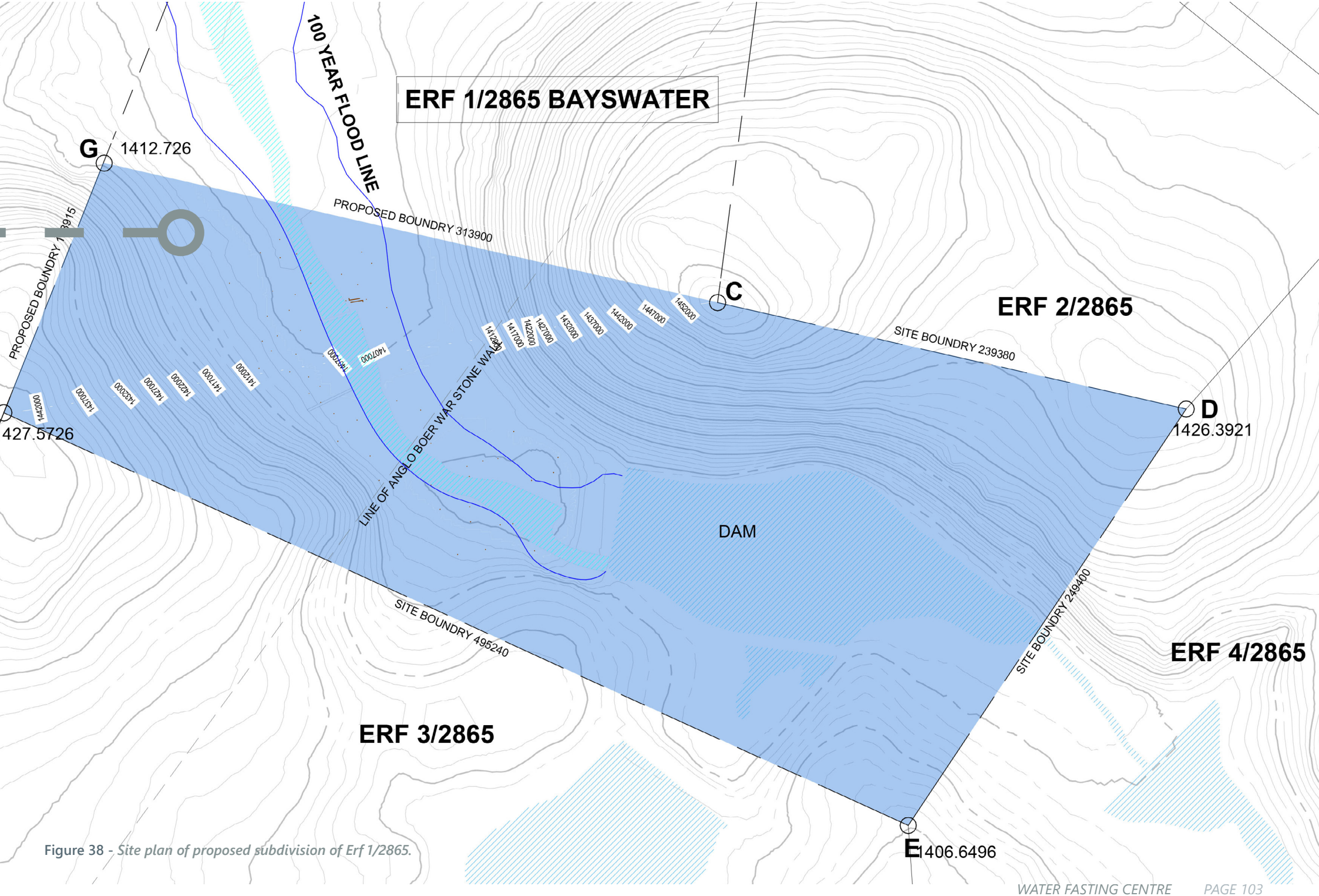


Figure 38 - *Site plan of proposed subdivision of Erf 1/2865.*

1.2.3—SITE SPECIFIC INFLUENCES

REGULATIONS AND GUIDELINES

As the site has an undetermined zoning classification of MOSS, there are no current regulatory limitations as of yet. The Floor Area Ratio (FAR) and lot Coverage will be up to my own discretions with a focus on preservation and sensitivity. The National Building Regulations will be closely adhered to throughout the design. The proposed subdivision will need to be rezoned as an E4 occupation (medical facility) through the local authorities.

MUNICIPAL SERVICES

The site is currently not serviced by any municipal electrical or water connections nor telephone lines. New connections for both electrical and water will be applied for as part of the operations and administrative approval.

There is an existing sewer line along the eastern side of the site, but in line with the design aims, an investigation into a natural waste disposal system is to be implemented, aligning with the closeness to nature the project aims to create. The center relies heavily on purified water which must always be available to the clients. Water will be collected via rain water harvesting in the rainy season as well as from the river, with an emergency water supply via a municipal connection during the dry winter months. Thus the proposal aims to be as independent from the municipal water supply as possible.

Figure 40 - *Scattered man-holes over site and 7 Dams conservancy.*

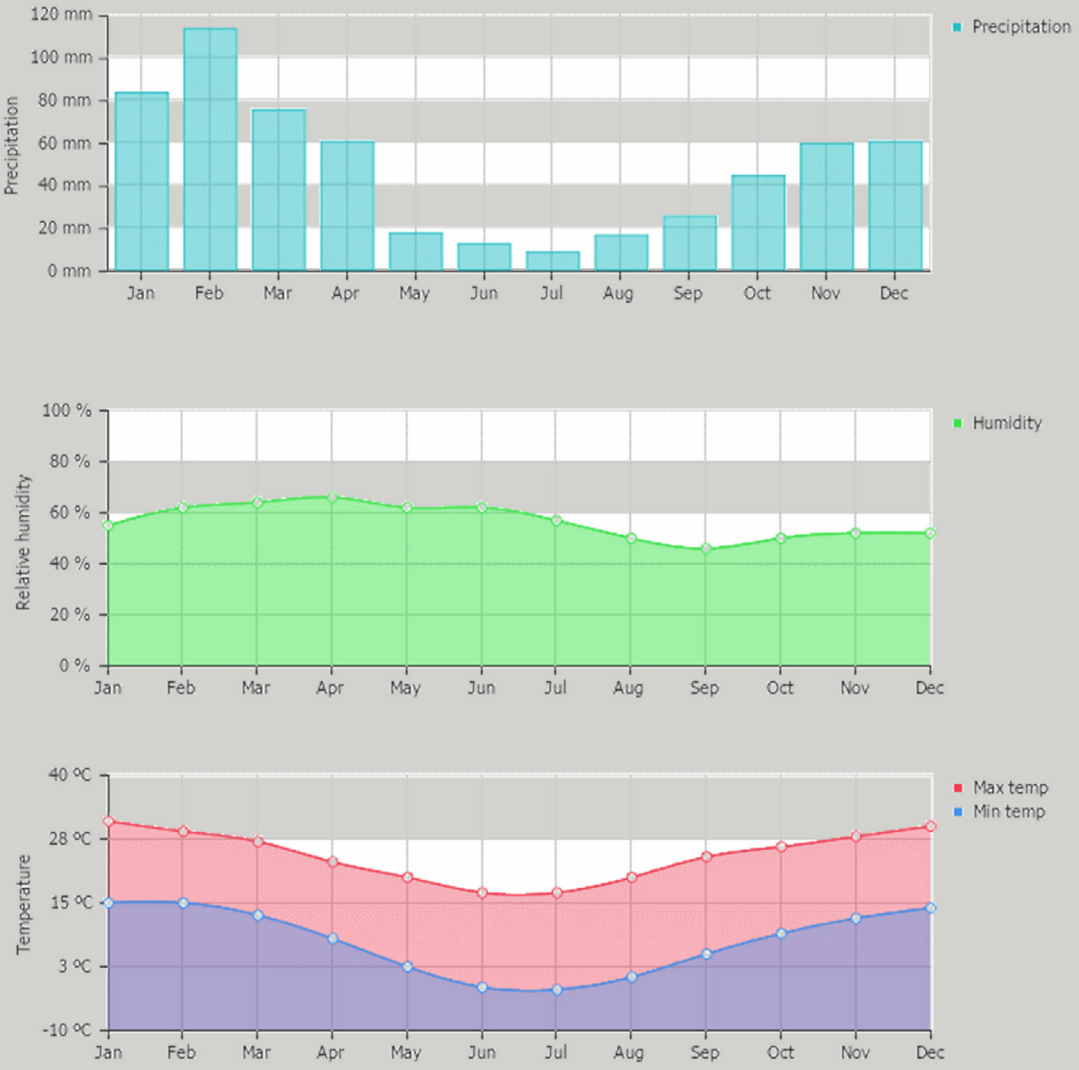


Figure 39 - *Climate data. Top - Monthly precipitation. Middle - Max. and min. temperatures. Bottom - Average monthly humidity. (Climate-data.org, 2018)*

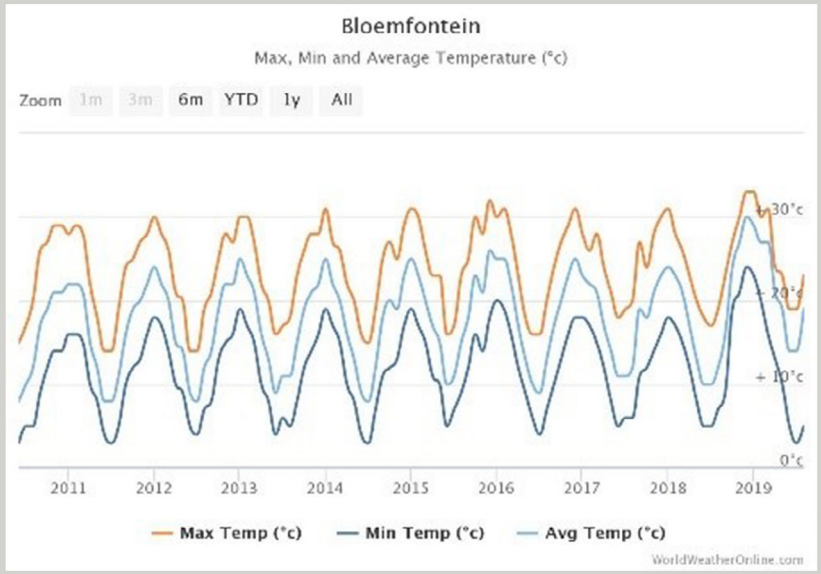
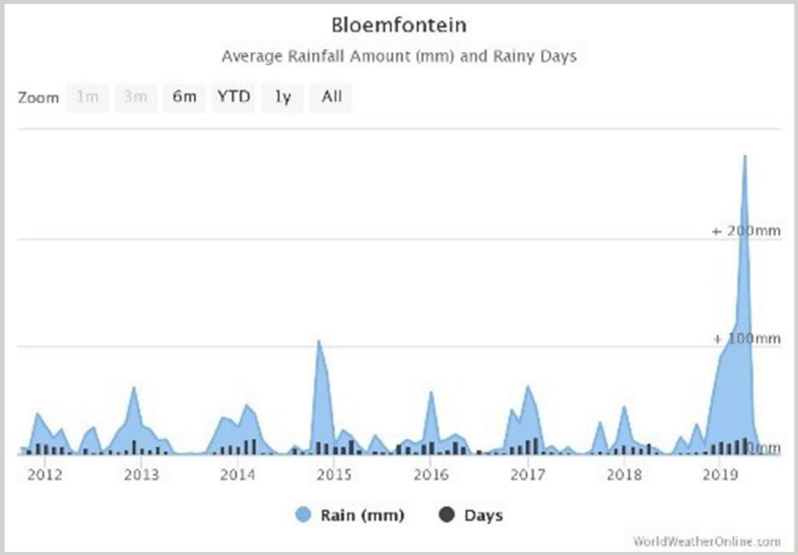


Figure 41 - *Yearly rainfall from 2012-2019 (top) Yearly temperature from 2011-2019 (bottom) (online - www.worldweatheronline.com, 2019)*



CLIMATE

Appropriate design response to climate is imperative to the success of the design. The proposal aims to make use of the ambient climate to improve the individual experience of nature throughout the year including change in seasons. Passive systems are used throughout the centre in order to maintain comfort level, via natural climate control, within the buildings.

In Bloemfontein, the summer average day-night temperature is around 22°C and the winter average is approximately 10°C, with a range of -2°C to 31°C throughout the year (Ashton, 2003). Compared to current conditions, it can be seen that due to the impact of global warming the city has seen changes in these average temperatures, along with rainfall change as seen in Figure 20. Typically the city receives an average of about 500mm throughout the year. Majority of the rainfall is within the summer months and close to no rainfall in the winter months of June and July (Climate-data.org, 2018). Closer analysis of the climate has been done in the design site analysis chapter (see page 70).

SECURITY REQUIREMENTS AND CONTEXTUAL ANALYSIS

SEVEN DAMS CONSERVANCY

The Friends of the 7 Dams Non-Governmental Organization (NGO) is responsible for upkeep and protection of the conservancy, which was gated in with coded gates in 2016 This results in the conservancy being a semi-public, protected and safe area with restrictions in place (https://7dams.co.za/). The code to the gate is now received following a small fee payed to the NGO which contributes to the upkeep and maintenance of the area. This includes building walkways, trimming pathways and installing benches and rubbish bins (Muller, 2016).

The proposed site for the dissertation abutts the conservancy with close relations to the conservation programs already existing (Krynauw, 2019). The use of the existing pathways and routes for the 7 Dams public will be included into the design process.

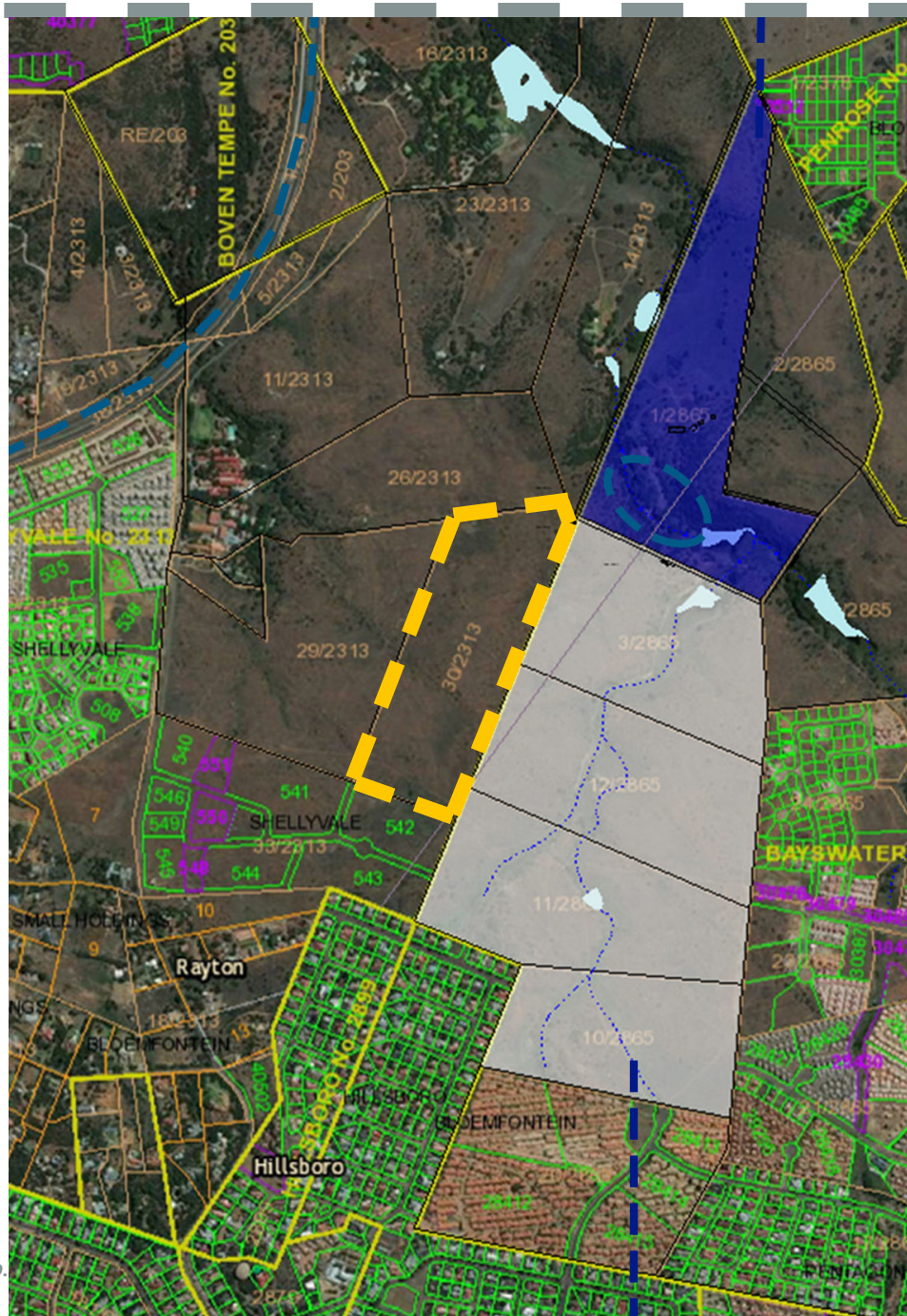


Figure 42 - *Contextual map.*

SURROUNDING CONTEXT

The yellow block (Figure 13) represents the erf which was sold at the beginning of 2019 by the government to a company which wishes to develop the plot into more townhouses (Mentz, 2019). This caused much backlash from the residents as appropriate methods for advertisement and comment were not followed. The conservancy is already backed by townhouses such as in Figure 14 and the residents object to a continuation of the monotony which has disrespect for nature. These town house complexes do not have nature or conservation in mind and tend to exploit habitats instantly (Mentz, 2019). Thus the proposal aims to mend the negative impacts of the built environment by producing a new set of guidelines for the remaining erfs abutting the conservancy which will exhibit a different approach to residential development. This will be further explored in Sustainability.

Figure 43 - *Typical architecture of the surrounding town houses of Bayswater.*

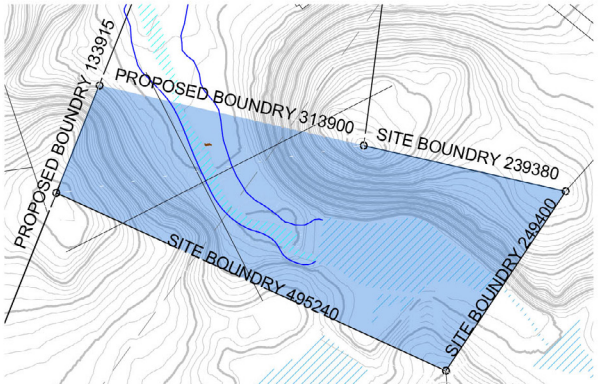
1.3 — TOPOGRAPHIC ANALYSIS

Topography is the study of the earth's surface, and it is the documentation of the existing and understanding how the earth falls and rises with existing elements, be it natural or manmade. Considering the selected site is farm land with few surrounding buildings, analysis of the topography will focus on the existing natural vegetation and natural and human systems of the land.

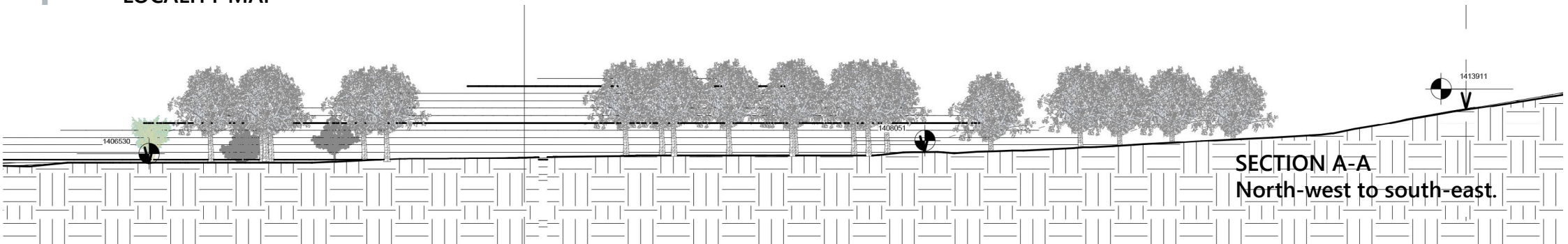
1.3.1 — LANDFORMS

The lay of the land is a mixture of steep sided isolated hills with escarpments, flat topped rocky plateaus, open valleys, with dammed streams and riparian wetlands which flood occasionally. Prominent dolerite sills and dykes form the land with rides, plateaus and rocky hills (Dingaan & Du Preez, 2002; Mucina, L & Rutherford, 2006). The dolerite stone can be used for stone construction, and has been used for majority the of the historical structures on site, such as the Boer War Stone Wall (Figure 21).

Figure 44 - *Boer War Stone Wall on site, constructed of stacked dolerite stone.*



LOCALITY MAP



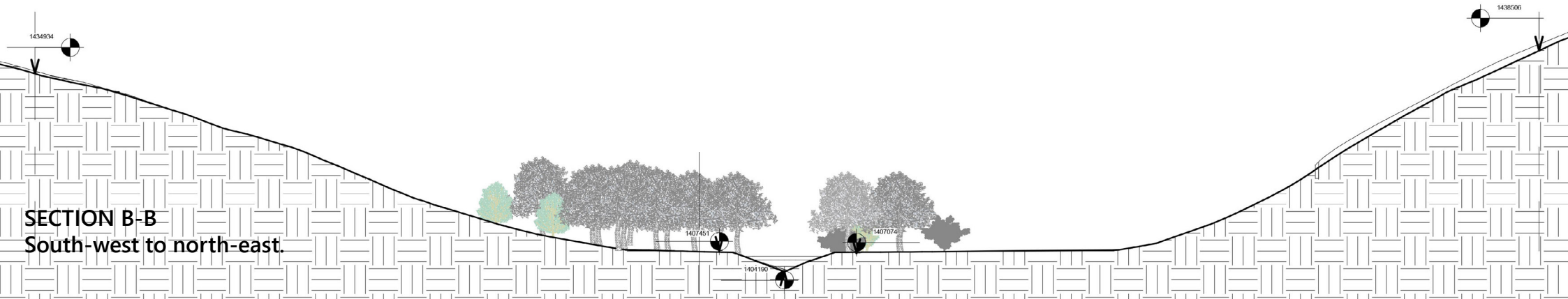
SECTION A-A
North-west to south-east.

1.3.2—VEGETATION

This specific vegetation belt of Bloemfontein is particularly interesting due to the amalgamation of four distinct biomes, of which the most prominent are the Bloemfontein Karroid shrub land (Gh8) and the Winburg Grassy Shrubland (Gh 7). The specific area in which the design will reside is in a thick woodland which is along the streambed (see Figure 23). This woodland is a mixture of both exotic and indigenous trees (please see page 77, Topology, for specific vegetation types). On the floodplain to the north of the stream is a mixture of grassland vegetation with small deposits of wetland foliage. All wetland ecosystems are protected by The National Environmental Management Act (NEMA) in South Africa, thus construction will only take place over the flood planes with the Winburg Grassy Shrubland foulage, as its protection status is least threatened (Sanbi Deat, 2009).

The Bloemfontein Karroid shrub land is a cluster of plants which are indigenous to the site and predominantly grow in shallow soils on the rocky outcrops. Usually it is defined as a protected biome, but in the 2018 Provisional Spatial Development plan, D. Collins declared that the Bloemfontein Karroid shrubland in this specific region has become so fragmented due to development, that it has become insignificant. Although much land has not yet been fully developed, the Karroid Shrubland needs the hooves of grazing animals in order to reproduce and spread. As a result of the area becoming an island within the built environment, there are little to no animals which have the ability to sustain this symbiotic relationship, and thus the biome is becoming obsolete (Krynauw, 2019). For a Map of biome loacationg please see page 83.

Figure 45 - *Bloemfontein Karroid shrubland vegetation type (Gh8). Succulents are limited to smaller crevices in the dolerite rock and the grasses or low shrubs grow in the slightly deeper soil.*



SECTION B-B
South-west to north-east.

1.3.3 – HYDROLOGICAL ANALYSIS

Water Paths

Hydraulic analysis of water on site and its health, with its effects on the ecosystems along with the usability of the water in the proposal showed the need for an intervention. As seen in figure 42, the Modder River flowing with water from the proposed site needs closer attention to its health (Lamprecht, 2018). This becomes a construction factor as the proposal intends to use the existing water throughout the design itself and aims to better nature through its existence. Thus understanding the water courses and quality can produce a designed filtration system which not only benefits the design, but the natural ecosystem further downstream (including the Botanical Gardens).

The proposed site is positioned directly below a catchment basin as in Figure 9 (Krynauw, 2019). These drainage lines are critical to the success of the vegetation and animals living in the area as well as the success of the dams, particularly now that the surrounding areas have been built up. Paved and tared surfaces result in further rainwater runoff being directed into the natural drainage lines. Thus the area has become more prone to seasonal flooding. The proposed design borders the existing river on the southern side accross from a large floodplain on the opposite side of the river (northern side). When there is a large cloud burst or heavy rainfall the flooding water collects in floodplain, leaving the northern bank of the river dry (Krynauw, 2019).

Water from proposed site.

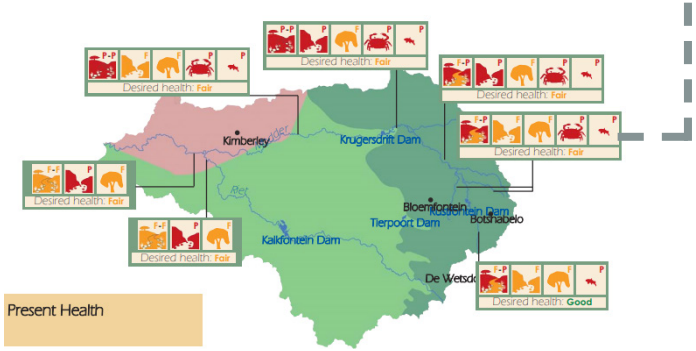


Figure 46 - *Current Water quality of Free State river systems. (Pete Ashton, 2003)*

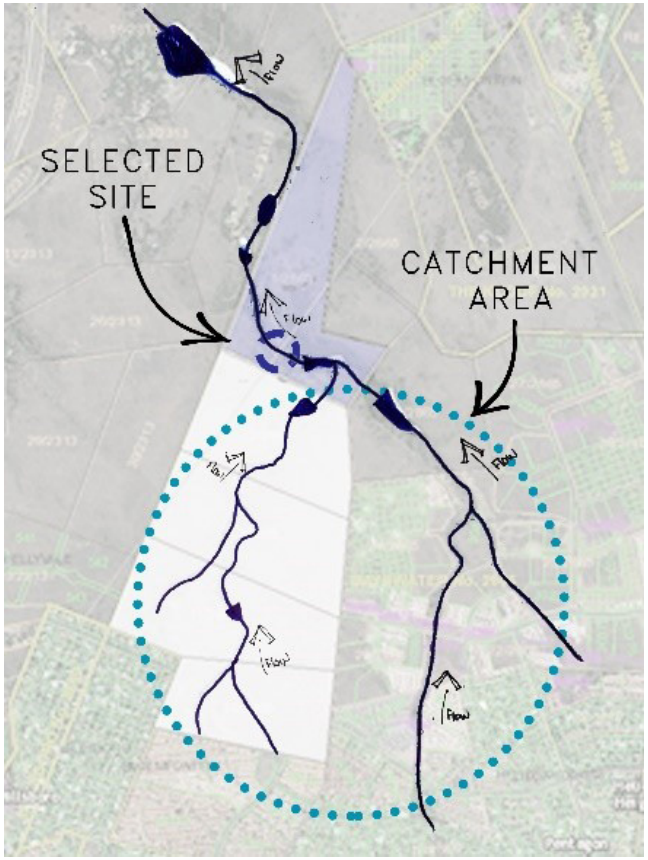


Figure 47 - *Catchment area in relation to the site.*

Floodlines

Flood lines as identified by LMV Consulting Engineers, who surveyed the site in 2018, are applied to the Figure 11 below with the indication of the flood planes to the north. The proposed building is cantilevered over the river in order to maintain a close connection and view to the river, whilst avoiding the floods.

Bloemfontein experienced adverse flooding in the year of 2019. The results have been captured by 7 Dams pedestrians and can be observed below. Allowance for the floods will be implemented in the design process with precautions followed.

Figure 49 - *Floods in early 2019 (Online - www.facebook.com/seven.dams/)*

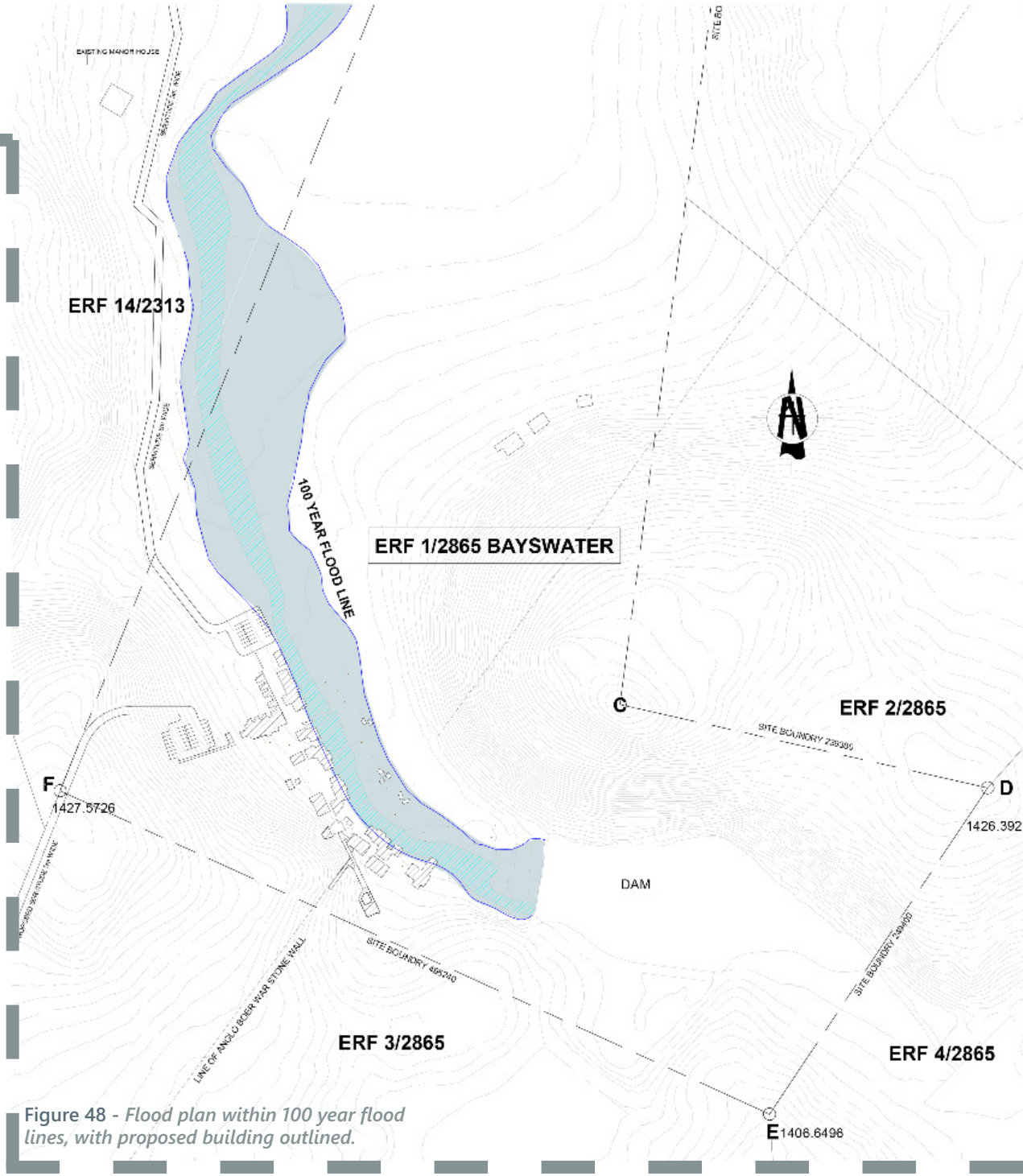


Figure 48 - *Flood plan within 100 year flood lines, with proposed building outlined.*

1.4—GEOTECHNICAL ANALYSIS

1.4.1—SITE GEOLOGY

The geological make-up of the site is not as complex as the wide veriaty of vegetation may imply (Brand, 2010). It is compromised of thick dolerite sills of the Jurassic age (Dingaan & Du Preez, 2002) and are occasionally topped by shale sediments and sandstone from the Beaufort and Karoo Groups (Brand, 2010). Soils which overlay the hills and ridges are Stoney Mispah, gravel which is shallow in nature. This soil generally has poor water holding properties due to the underlying rock bed and gravel the nature of which is derived from the dolerite (Mucina, & Rutherford, 2006). Whilst over the rocky outcrops poses a shallow layer of aeolian sand. Both these soil types on the hills and sills are usually from a depth of 10-50mm (Brand, 2010). Within the valleys or riparian zone the soils are found to be much deeper, about 300-10000mm, and are a result of erosion over time, creating the soil type of Vertic Rensberg (Mucina, L & Rutherford, 2006).

In terms of construction detailing one can deduct that using the deeper soils in the valley (where the center is located) poses few construction threats as the soil is stable and deep. Therefore one can conclude that shallow foundations will suffice (depending on the type of structure), and little to no blasting will be needed into the rock, as foundations could be cast atop the rock. With this in mind, construction over the floodplain will need to be raised and possibly utilize pile foundation structures for stability and flood avoidance.

Figure 50 - *Excavated soil on the higher rocky hills, showing the ground make-up. (2019, P. Vorster)*

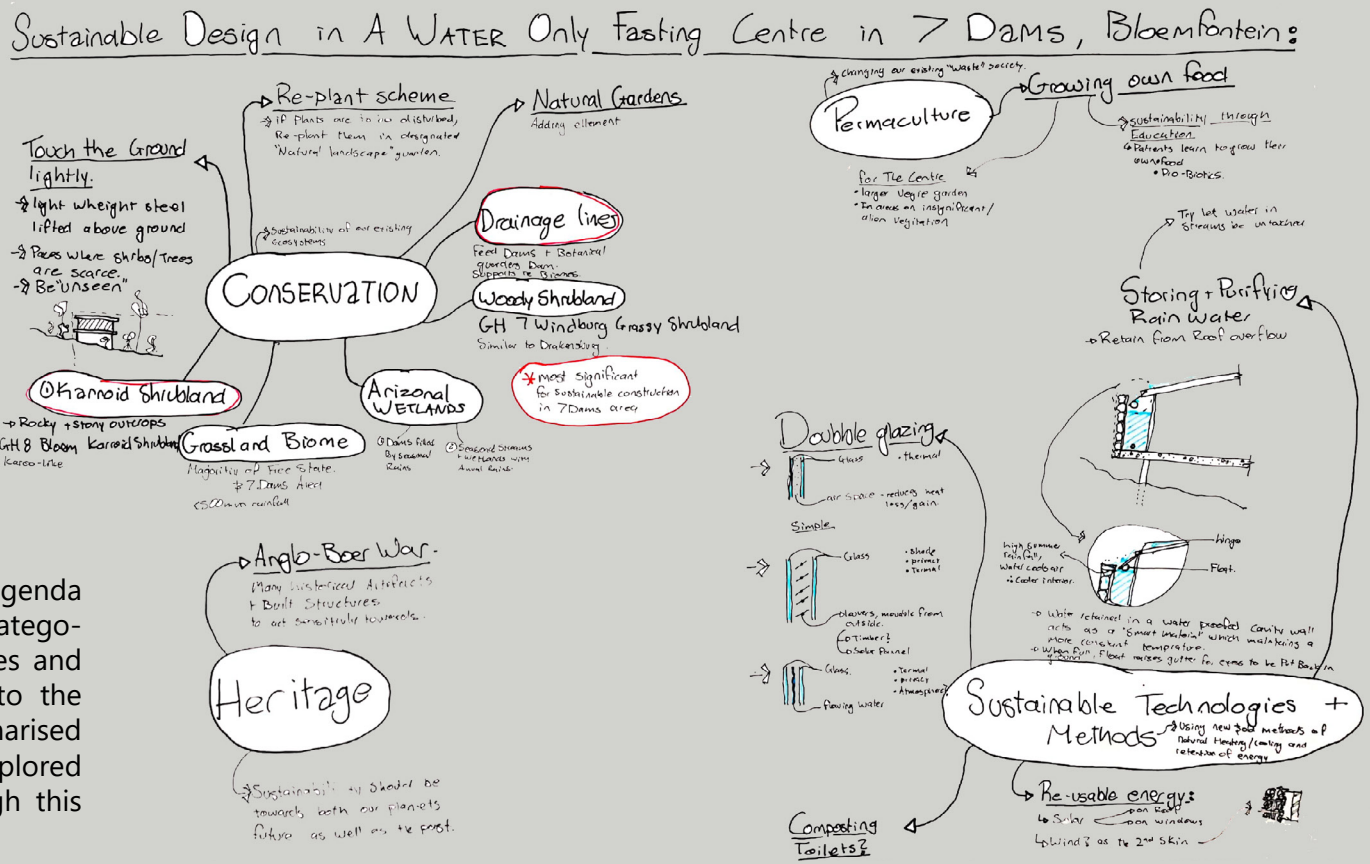
2—THE SUSTAINABILITY AGENDA

Whilst Green or Sustainable architecture in our contemporary urban environment has had an laudable impact on architectural design, we often find architects checking predetermined boxes for a Green rating and neglecting the true essence of producing sustainable architecture (Mehaffy & Salingaros, 2013). Buildings proposed to be "green" or "Sustainable" are concealed in glass and require major air conditioning systems for heating and cooling without consideration of nature itself. Green Architecture tends to lean towards direct mimicking of nature in a building façade, which is some improvement , but still fail to draw a line between incorporating nature in a building whilst still being able to use nature to its full potential (such as food production on natural ventilation). Thus, this project aims to challenge the conventional "sustainable" typology through the incorporation of various technologies and systems, aiming to improve the surrounding nature whilst being a building of minimal ecological impact.

Further, the design aims to strengthen each individual's relationship with nature, creating an understanding that nature can heal, if we heal nature.

"Nature always wants to save you, if you make the first step toward nature, nature will run to you."

– Dr. Alan Goldhammer



The sustainability agenda is split into basic categories based on challenges and opportunities relating to the design. This is summarised bellow and will be explored in further detail through this chapter.

2.1– OBSTACLES AND OPPORTUNITIES

As previously mentioned, the design aims to bring the individual closer to nature through being in nature, educational talks and experiencing the natural process of fasting. Thus, the design is inherently of natural sensitivity. Therefore, the opportunities to address sustainability are endless.

Implementing the legal regulations related to designing sustainable architecture can be both a limitation and opportunity. The Laws and regulations of the National Building Regulations (NBR) and SANS 10400 Part XA have been put into place to create a better built environment. A challenge specific to the design includes the specifications on the amount of glazing permitted throughout a building. Thus the proposal will have large glass facades to create an organic design by breaking the barrier between building, person and nature. Thus technologies and systems are designed to minimize glazing's thermal shortcomings.

2.1.1–Dietary CO2 emissions

The program of the Fasting Centre aims to improve individual health through addressing eating habits and medical preferences. Each client will be encouraged to eat predominantly plant based diets, thereby lowering food carbon footprints by eliminating the large carbon footprint associated with meat production. Whilst this may appear to be a pitiful contribution in the face of reusable energy, it has become a rising concern for those aiming to lower carbon emissions. According to a study at Tulane University's School of Public Health and Tropical Medicine, without the lowering of meat consumption, particularly red meats, the aim of hindering the increase in global warming to 1.5°C will be un-accomplishable (Leahy, 2019). By the simple elimination of meats from a diet, an individual can almost halve food CO2 emissions (see Figure 25). Thus the program offers a social sustainability through the influence and encouragement of better diets, for both the clients and the world.

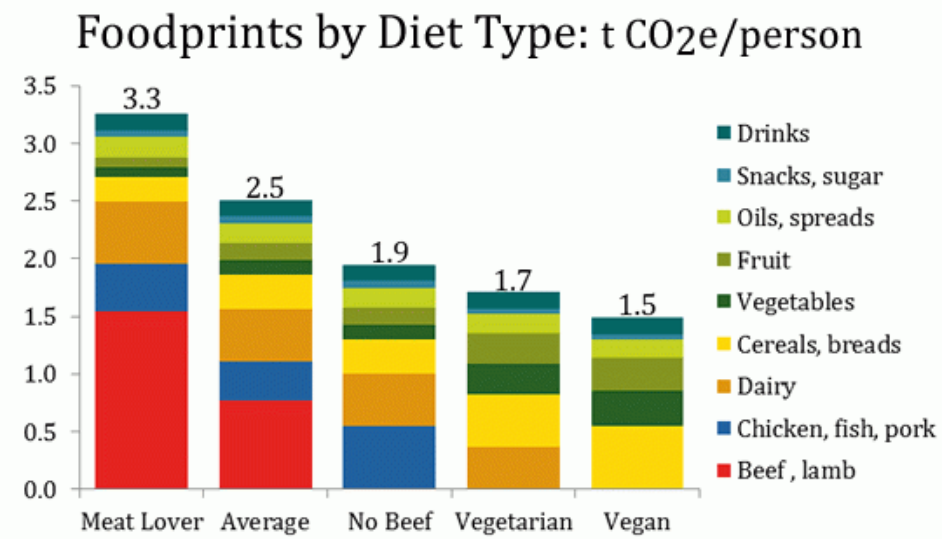


Figure 51 - *Carbon emissions based on diet types (Online - shrinkthatfootprint.com)*

2.1.2–Locational Sustainability

Placing the design on the perimeter of the city means that employees will have the opportunity to use public transport or even bicycle routes (close proximity to residential area). The travel distance is minimized and employees are not drawn away from their families and education institutes in the city, unless they are forced to live far out for other reasons.

The selected site is in close proximity to the Bram Fischer International Airport (approximately 15km) so that access to the Centre form other parts of the country becomes easy.

Further than this, creating the Centre on the outer edge of the city creates the opportunity for easy and quick access to the Centre for both fasting clients and educational training. The Centre will provide opportunity for learning about the natural benefits of fasting through lectures, along with permaculture education and training for local residents. The intention is for the culture of permaculture to radiate through the employees into their surrounding social culture and grow the understanding of the need to grow one's own food.

2.1.3—Conservation

Sustainable conservation aims to produce an intervention which encourages the existing ecosystems on the site whilst allowing the building to be as undisruptive as possible, from construction to use. The conservation lends itself to the fauna and flora, as well as to the existing historical elements on site as well as the existing rituals of the users.

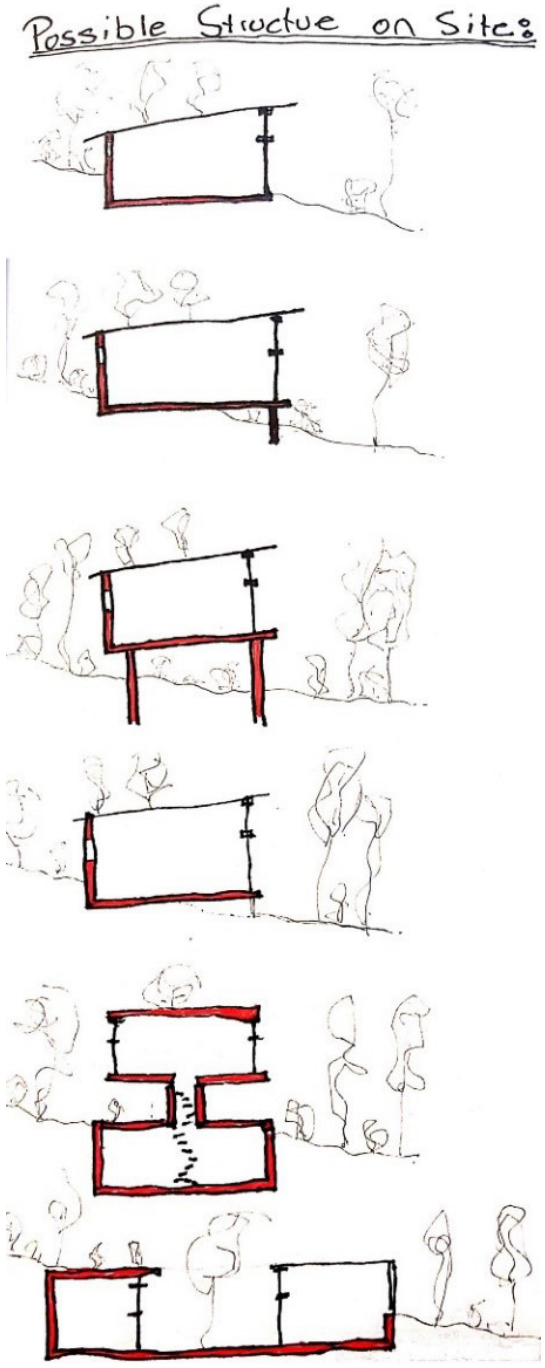
EXISTING ECOSYSTEMS

The existing ecosystems are extremely complex particularly due to their mosaic of biomes. With the understanding that the Karroid Shrubland is on the protected list along with wetlands, the proposal's selected micro site resides on the water's edge under the wooded canopy where the ground cover is dominated by the declared invasive grass species, pennisetum clandestinum (category 1B), better known as kikuyu (Lamprecht, 2018).

Construction emphasis is still placed on extreme sensitivity when touching the earth (Figure 26). More than this, the design aims to blend into the landscape through material use and massing, so as to not overpower nature, but to become one with the existing. The design's structural systems will be heavier on the ground, closer to the water's edge where the kikuyu is, and lighter the further into the indigenous foliage, by being raised steel structures.

All natural indigenous vegetation which is displaced, is retained and used within the design itself (planters, roof gardens) to minimize or eradicate any biodiversity loss.

The intervention is as open as possible with no gates or fences which could possible deter the natural movement of the existing small mammals or bird life on site. Integrating with the conservancy could grow their populations by creating a larger area where the animals can roam and forage.



2.1.4—Heritage

Historical sustainability should respect both our planet's future, as well as respect and learn from our past. On site there are several historical elements which will be incorporated into the design. The laws of the National Heritage Resources Act no. 25 of 1999 states that any structure older than 60 years is considered a heritage structure and should be treated according to the relevant legislation. The agenda for the historical elements on site is as follows:

1—The Dam walls:

From an aerial photograph of 1941 we understand that the structures are older than 60 years and hold significance (Figure 27). Thus the dam walls are to be maintained and incorporated in the design slowing deterioration. Informative boards of the historical elements on site will be made available to educate as to the relevance of the prior inhabitants of the land (Henderson, 2008).

2—Anglo Boer War Wall:

The Stone wall as seen in Figure 21 is incorporated into the landscaping and walking routs on the site, whilst ensuring routs are not too close as to discourage people from climbing the wall. (Henderson, 2008)to the forgoing legislation.

3—Structure:

These historical structures, as seen in Figure 28, have been incorporated into the design and used for significant places of contemplation. The design of the building will not harm the existing, but rather create a separation through structure. A visual link through materiality creates an ode to the structure, such as in Figure 29.

PROPOSED SITE

Figure 52 - *Aerial photograph dating to 1941 shows the dam walls on site (unknown)*

Figure 53 - *Historical structures on site.*

Figure 54 - *Corten steel restoration. (Online - Archdaily.com)*

2.2– IMPLEMENTATION OF SUSTAINABLE METHODS AND TECHNOLOGIES

In order to design an efficient building in the sense of sustainability it is imperative to investigate and explore existing methods and technologies which are used successfully. Often, though, architects end up looking toward the newest technologies and forget to look back into history and utilise the sustainable methods of our electricity-less ancestors, and use their methods for elements such as heating and cooling.

2.2.1–Natural Gardens & Permaculture

The program of the Fasting Centre aims to improve individual health through addressing eating habits and medical preferences. Each client will be encouraged to eat predominantly plant based diets, thereby lowering food carbon footprints by eliminating the large carbon footprint associated with meat production. Whilst this may appear to be a pitiful contribution in the face of reusable energy, it has become a rising concern for those aiming to lower carbon emissions. According to a study at Tulane University's School of Public Health and Tropical Medicine, without the lowering of meat consumption, particularly red meats, the aim of hindering the increase in global warming to 1.5°C will be un-accomplishable (Leahy, 2019). By the simple elimination of meats from a diet, an individual can almost halve food CO2 emissions (see Figure 25). The program offers a social sustainability through the influence and encouragement of better diets, for both the clients and the world.

"Permaculture is defined as consciously designed landscapes which mimic the patterns and relationships found in nature, while yielding an abundance of food, fiber and energy for the provision of local needs"
– David Holmgren 'Pathways to Sustainability' 2004

The main activity associated with permaculture is the development of agricultural ecosystems intended to be sustainable and self-sufficient through the mimicking of natural patterns or systems. Permaculture is driven by 12 principles which are universal in theory and can be adapted in most circumstances of life. Living a life which is driven by predetermined principals, ethics, priorities and orders which revolve around fair share, people care and earth care, drives people to live a life which impacts positively on the world. Permaculture emphasizes the celebration and use of the edge or boundary, using the hybridization of separate elements coming together, breaking the threshold and producing a better solution or system through bringing us closer to nature. Permaculture design should encourage and provide a platform for people to learn about the ease of permaculture living in an environment which heals and grows. Whilst permaculture aims to produce home grown food in a sustainable manor, the principles guide a group of humans into a community who share similar interest and goals, creating a culture. Thus, elements under Permaculture theory should incorporate community appropriate design which will encourage connectivity and community engagement both within the centre itself and throughout the social context of the employees.

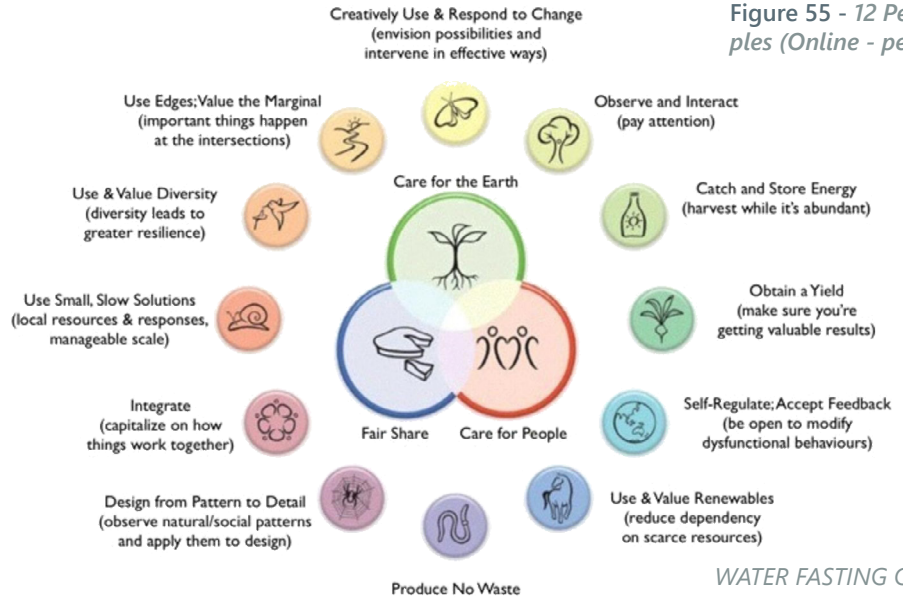


Figure 55 - *12 Permaculture principles (Online - permaculturenews.org)*

2.2.2– Purifying and Storing Water

Water storage

As the design is a water only fasting Centre, water purification and storage are essential. Water storage will predominantly be within the dammed stream itself, the water from the streambed will then be filtered through a filtration system and then redirected for consumption.

The storage of storm water is stored within the walls of the buildings possibly as in Figure 32. This will help with insulative properties and the availability of water to the units. Using water as the 'walls' emphasizes the existence of water throughout the design and its natural qualities we so often forget, falling in line with the theoretical aspect of the design.

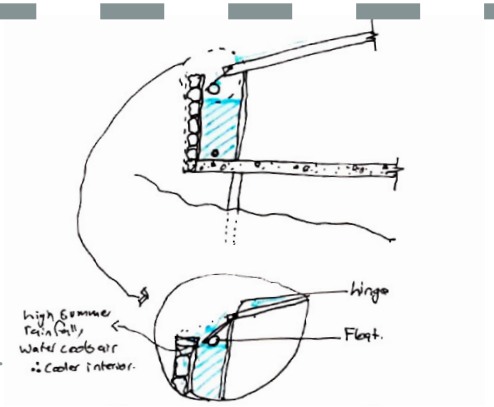


Figure 56 - *Possible wall water storage methods.*

Pool

For the swimming pool a natural system will be used which encourages the possibility of natural life within the pool and eliminates the need for harsh chemicals which damage the environment as well as our skins. This system will function as follows:

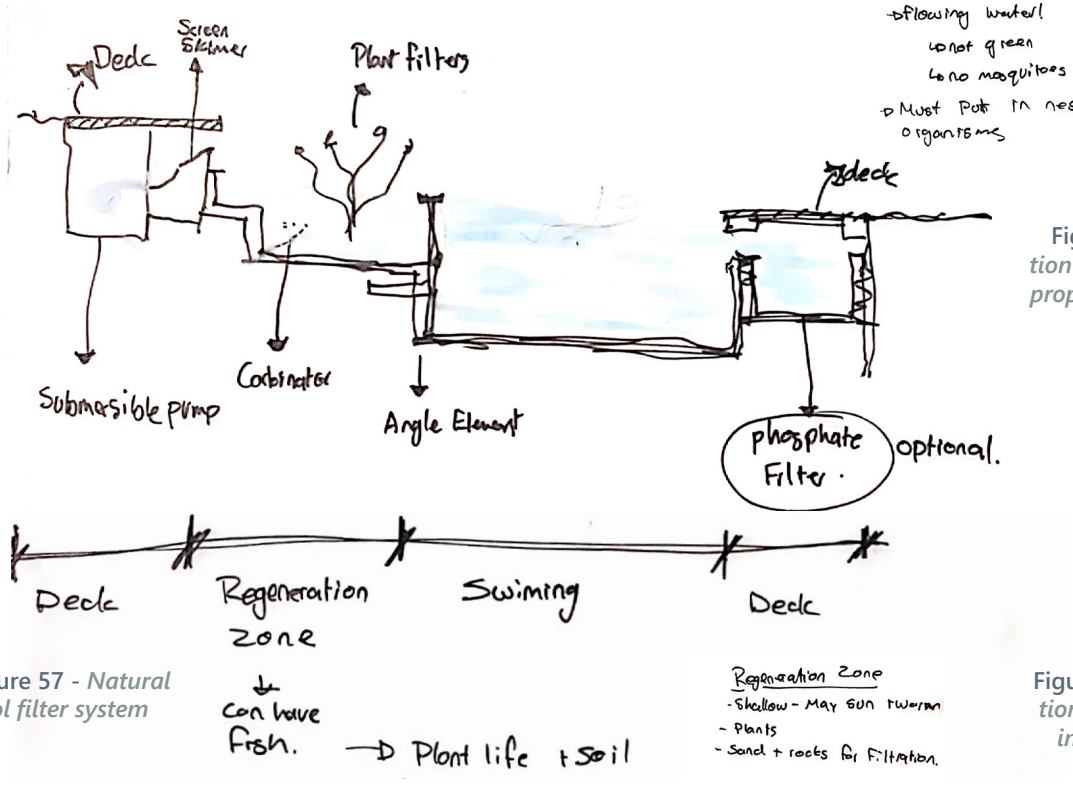


Figure 57 - *Natural Pool filter system*

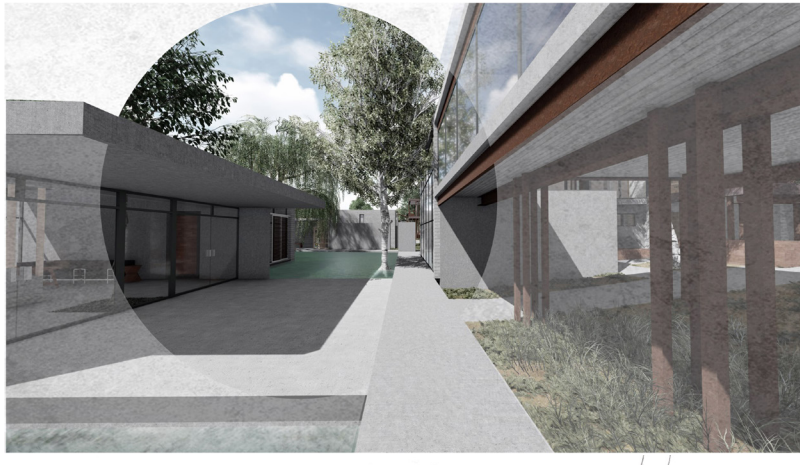


Figure 59 - *Application of natural pool in proposal - perspective*

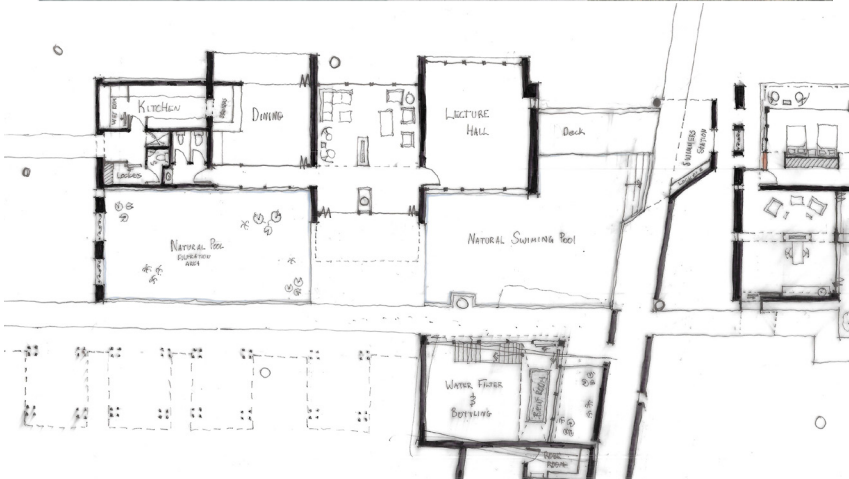


Figure 58 - *Application of natural pool in proposal - plan*

Natural filtration – down-stream protection

A natural filtration system will be applied to the existing stream, just bellow the largest dam wall. This filtration system ensures the health and success of the ecosystems downstream as the catchment area has become built up. The runoff and wastewater of the surrounding residential areas has become polluted.

The implementation of a Biological Filtration System will prevent the pollutants from entering the larger water systems and encourage ecosystem health past the project's intervention. The system is a low maintenance system with uses the natural gravitational flow of water as the driving force along with elements such as sand and plants which naturally filter water, such as Nymphaea, Typha and Pandanus. Pollution control will be mostly managed through the use of living bacteria which capture and degrade organic waste into non-toxic nitrate or nitrogen. Large debris will be captured in the rock and gravel cascades and will be manually cleaned when necessary. The system is as follows.

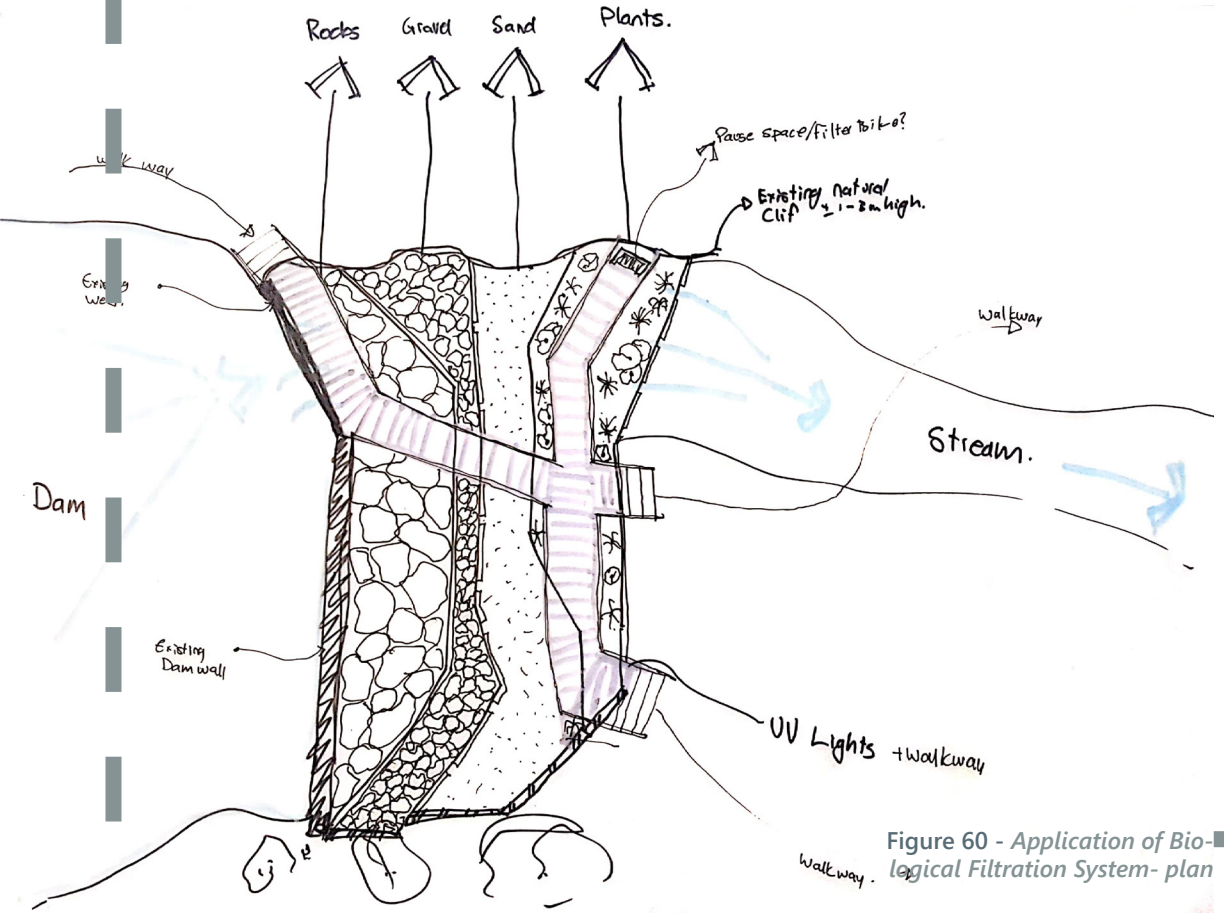


Figure 60 - *Application of Biological Filtration System- plan*

Position of filter in proposal

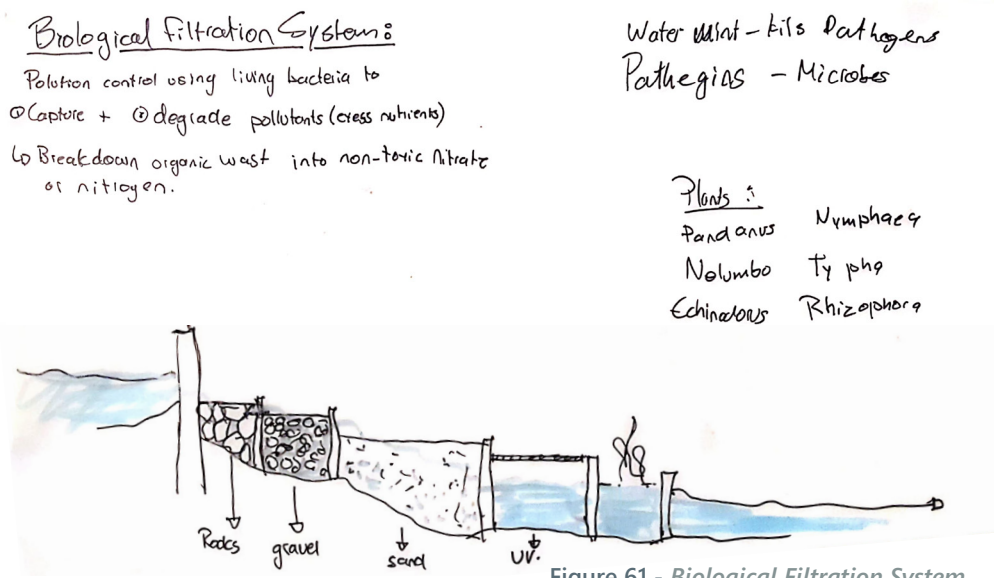


Figure 61 - *Biological Filtration System*

2.3– Potential of Glazing

The proposal makes use of large curtain wall systems, blurring the boundary between inside and out. The vast glazing systems called for extra precautions and measures to ensure the heat gain is within the requirements of SANS10400 Part N, glazing, and Part XA, energy usage in buildings. Considering the proposal exceeds 15% fenestration area to net floor area, specialized systems and extra precautions have been put into place in order to lower the energy needs, in accordance with SANS 204.

In order to comply with the regulations and to enhance a better internal climate, the curtain systems have been carefully selected, with additional shading systems. The curtain wall system makes use of aluminium frame, with a thermal gap, and double-glazed panes, lowering solar heat gain. Large overhangs shade the glazing, allowing lower winter rays to penetrate the building, but blocking out the higher summer rays. Where overhangs are not applied, shading is offered by sliding louver systems placed on the exterior. The louver system is louvered corten steel and can be retracted in the winter months for more warm sun, but opened in the summer months to create a heat barrier from the sun.

The double-glazing system is the X2 Superior system from PG glass, which allows for 35% plus window to floor ratio. The 12mm air gap provides insulation from both the solar influences as well as sound. The glazing is a combination of clear glass (interior) and high-performance coated glass (exterior). This system allows for maximum light whilst maintaining internal climatic conditions, with an improved insulation of up to 70% (Warrington, 2017). The efficiencies of the glass are endless, as indicated in Figure 34.

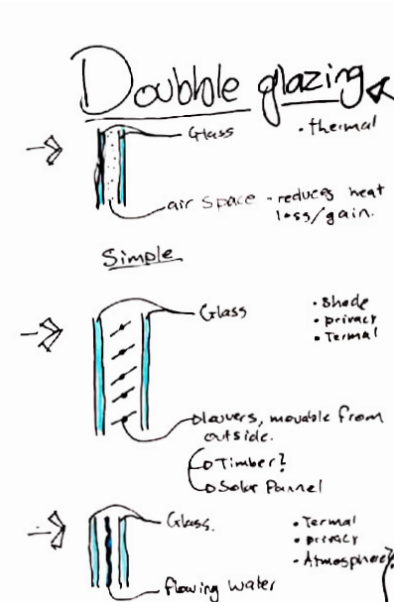
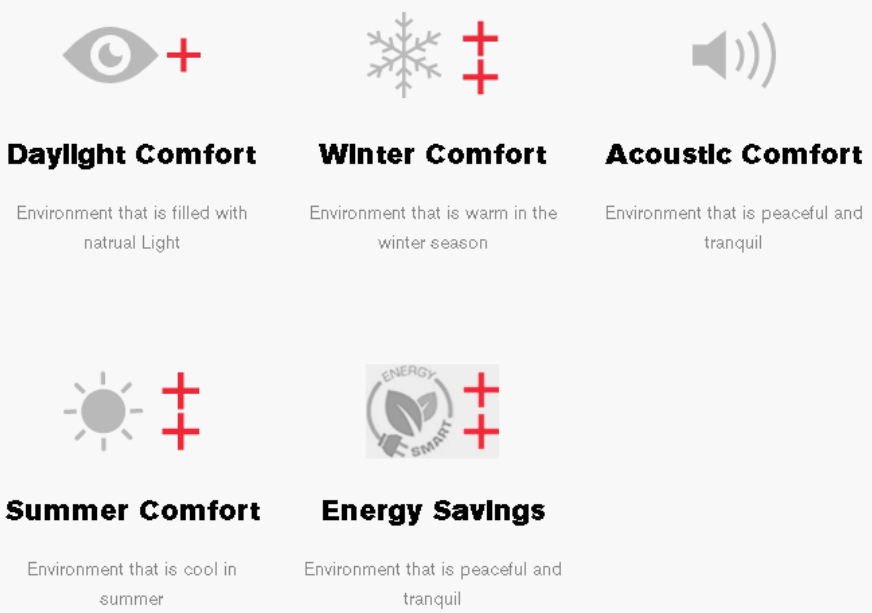


Figure 62 - *Possible glazing options*



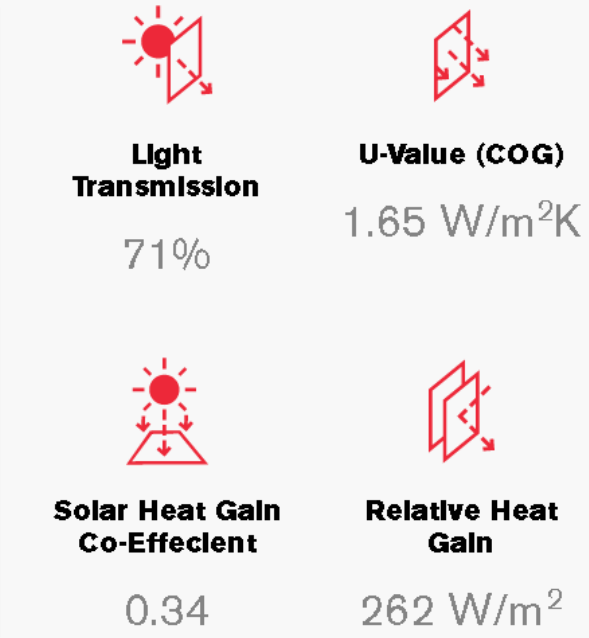


Figure 63 - *Key functions of the X2 Superior™ PG glazing system (2019, online: pgsmartglass.co.za)*

3—STRUCTURAL & MATERIAL INVESTIGATION

3.1— Structural pallette

The design compliments the broken topography of the site. As previously explained the site has an amalgamation of landscapes, Romantic (Forest like, where earth dominates the skies), Classical (hill like, where the sky and earth are in equilibrium, undulated earth) and Cosmic (grassland like, where the sky is dominant over a flat earth). Typically there are architypes or morphologies which are related to each and inform the structure, such as a romantic- vertical and light-weight structure, Classical – horizontal and flat rooves and Cosmic – solid enclosed structure which is internally focused (Norberg-Schultz, 1980). These need to be combined in the project within forms but expressed through the materiality. Thus the construction types of the project varies to create spaces of contemplation, comfort and discovery off the backbone of an unraveled labyrinth.

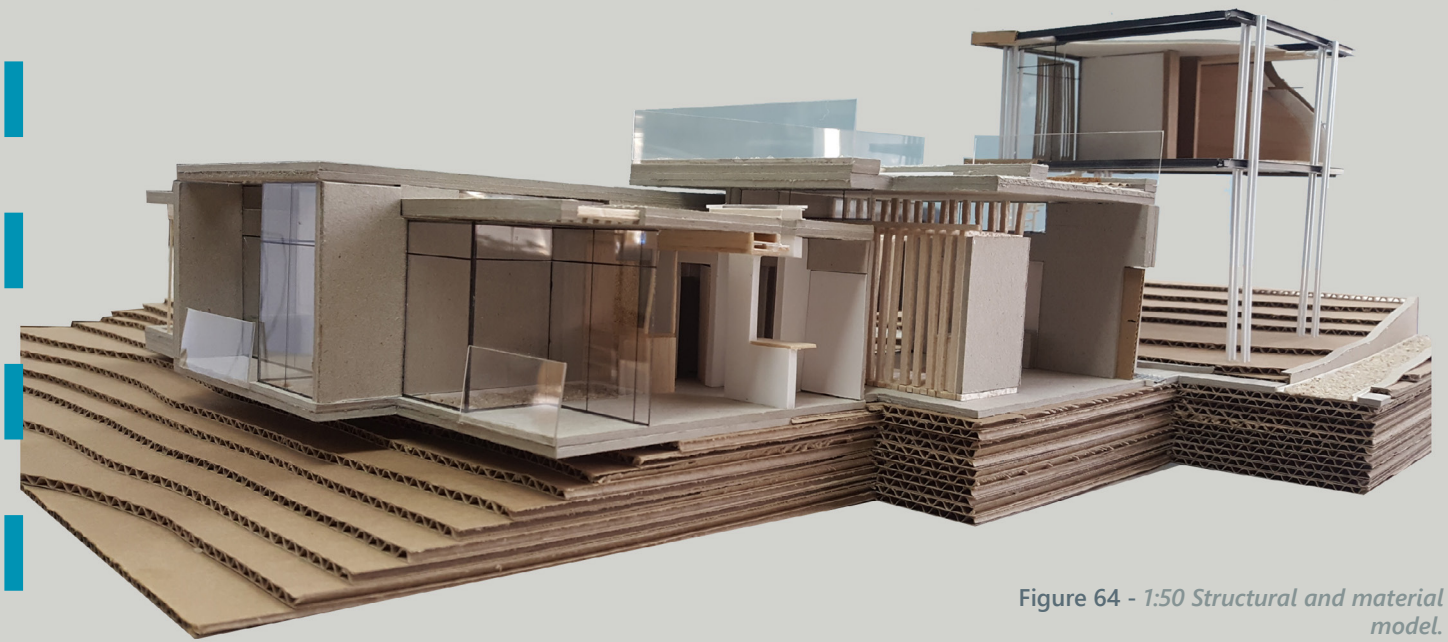
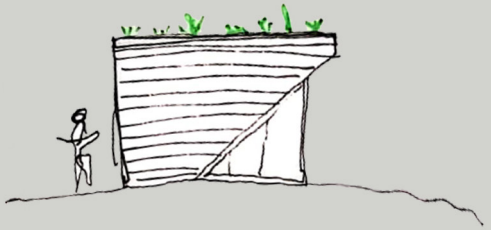
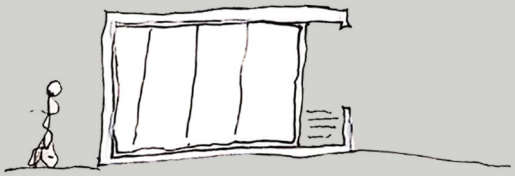


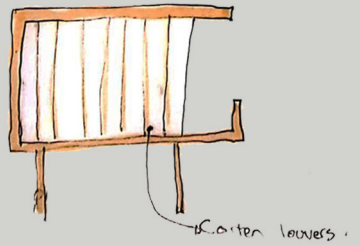
Figure 64 - *1:50 Structural and material model.*



CONCRETE AND GREEN ROOF



MONOLITHIC CONCRETE & INFILL



RAISED STEEL

3.2– CONCRETE CONSTRUCTION

The main structural material of the design is concrete. In situ concrete elements will make use of different textures of the shuttering in order to create visual diversity. By using different types and methods of shuttering for the concrete, a wide range of textures becomes available (Figure 35) which will differentiate the public and private areas in the design. Thus we comprehend that the in situ concrete elements will not only make up the floor slabs, but will be a continuous floor, wall and roof box-element.

In situ concrete construction method is the pouring of concrete into specific formwork on the site. This formwork can be of the ground (strip foundations) or from other shuttering such as timber or steel (for walls and roofs) (Zein, 2017). In situ construction for walls and roofs is more complicated than the conventional brick and mortar for walls and precast elements on top of supporting columns and beams for roofs. This is because the framework needed for the concrete is often complicated to construct with the steel reinforcing in place and must support the concrete until it has dried to a sufficient strength. When considering using an in situ structure site, accessibility and location is imperative, as large trucks will need to deliver the concrete.

Using complicated formwork, in situ concrete can be very flexible and fluid in form, creating monolithic elements, a floor, wall and roof such as in the Bosjes Chapel(Figure 36). Precast elements can offer similar results but are delivered on site and so will need to be smaller to fit on the transport trucks.

Concrete has high fire-resistance as well as water resistance. Concrete has an impressive compression strength, but is brittle under tensile loads, thus the steel reinforcing which has higher tensile strength (Harkness, et al., 2015).

3.2.1– Monolithic Concrete structure with infill

A monolithic structure refers to a structure which is carved, excavated or in this case, cast out of a single material (Croft, 2004). Whilst in situ concrete as a structure is impressive, a complete concrete monolithic box is often not visually pleasing or calming, therefore a composite of concrete and infill materials as walls and windows provide an opportunity for materials to encompass place making (such as the glass in the Bosjes chapel, Figure 36).

Therefore, understanding the materials' different qualities when joining them together becomes important. Concrete is considered to be one of the materials which reacts to changing temperatures the least, while metal is prone to thermal movement. Thus when designing a building where these elements encounter, it is important to design the joins duly with expansion joints in mind (Concrete Sask, 2018).

There are many different materials which can be used for infill, singularly or in combination, some options for the project can be seen bellow:

3.2.2– Materiality of Concrete

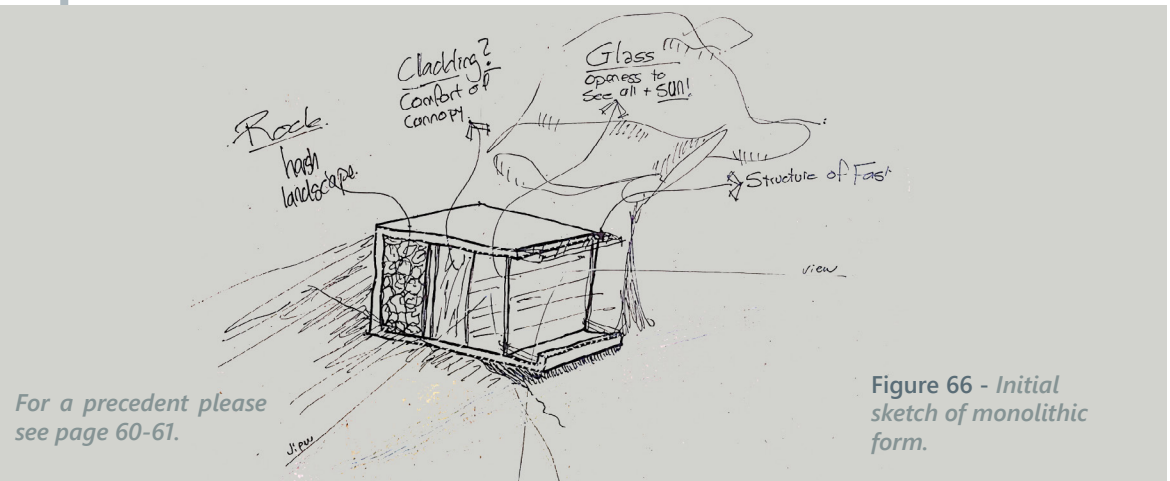
Concrete, also known as liquid rock, has many advantageous characteristics. Concrete is a composite of different materials, primarily cement, water and aggregate (either gravel, sand, rock or even polystyrene). By adding different proportions or grades of each material, the characteristic of the concrete can be changed, such as texture, strength and workability. Other elements have been designed to be added to concrete which, again provide more variations on the appearance and function of the concrete, such as colour or perviousness (Tsubaki, 2008).

Concrete has the capacity to become a still life of a liquid form. As concrete is a liquid before it sets, it has the innate ability to hold the form of its framework, not only in mass, but as the negative of the texture which held together the moldable liquid (Harkness, et al., 2015). Using concrete within the proposal highlights the magnitude and strength of liquid, namely water. Thus the fluid will be set in different textured formwork as to mould the liquid rock into differentiable caves of comfort.

Finish

Concrete can be used in its raw form, known as 'Béton brut', painted or varnished for a cleaner look. Throughout the design the concrete is cast in-situ, retaining the memory of the framework, the public areas cast in timber slats and the private sectors cast in smooth formwork. The interior is finished with a transparent surface sealer - Colour Bond and painted with oil-based paint on accent walls. Applying a surface sealer prevents the existence of cement dust due to wearing.

Durability and low life-span maintenance go hand in hand with raw concrete finishes. The intervention will not require painting (except for accent walls) and thus will have a lower life-span cost, as well as lower lifespan CO2 emission.



For a precedent please see page 60-61.

Figure 66 - *Initial sketch of monolithic form.*

Waterproofing

Whilst concrete appears to be a solid mass, impenetrable by all means, it is in fact porous (varying form composite proportions). Although water is an essential part of the curing process, it becomes unfavorable for water to penetrate the concrete once fully cured. Once water imbeds within the concrete, the concrete cracks, weakening the structural integrity. Recent discoveries have provided a solution which does not compromise the appearance of concrete (i.e. no unsightly bitumen waterproofing). The solution is the introduction of crystals into the cement at the batching stage. The crystals swell and grow when in contact with water, thus blocking the pores within the concrete, resulting in the concrete being impervious. The crystal technology also aids in self-healing, where hairline cracks occur, the crystals swell, preventing the cracks from growing, or being obviously visible (Al-Otoom & Al-Khlaifa, 2007).

Thermal Value

Concrete, when in contact with radiant heat, has the ability to reduce heating and cooling energy requirements by up to 29% (Concrete Sask, 2018). Concrete's thermal mass is considered effective at a depth of 100mm, which is minimum in the construction of the proposal. Concrete's thermal properties are most effective when left exposed (Designing Buildings, 2019).

Thermal mass is effective as the material absorbs heat during the day, stores it, and releases the heat energy at night. This maintains a more stable internal thermal condition, as it delays temperature swings, lowering the need for heating and cooling (Designing Buildings, 2019).

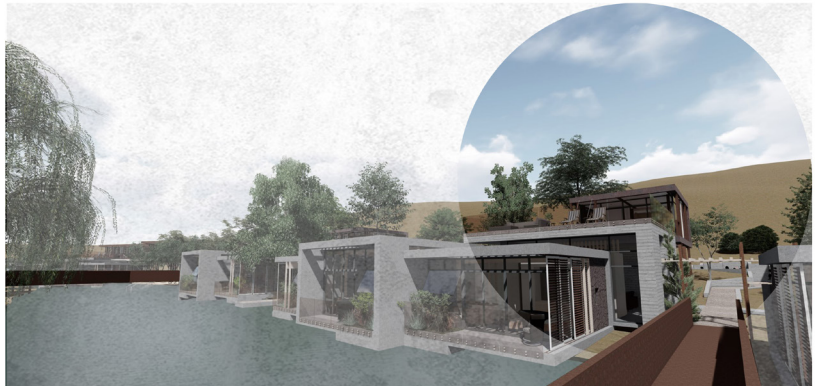


Figure 65 - *Perspective of concrete living units.*

3.3– STEEL CONSTRUCTION

Steel construction is becoming an increasingly tantalizing material to use. The high tensile strengths, as well as impressive compression, means that much thinner supports can be used, both vertically and horizontally, in comparison to concrete or masonry. This allows for slim and sleek buildings with larger openings. A steel framed building consists of not only beams and columns, but of bracing, studs, bearers and joists. These need to be understood so that load paths can be effectively transferred (Steel Construction.info, 2018). Steel construction can be in the form of lightweight steel or steel framed construction. Lightweight steel construction makes use of cold rolled steel sections (figure 62), whilst steel framed construction can be from heavier, hot-rolled sections. The proposal uses steel framed construction, as the steel can be of weathering steel.

A common practice is to use precast concrete slabs (preferably hollow core, as it is lighter) for the floor slabs, and can also be used as a roof structure. When using concrete in the steel frame, careful detail should be applied to movement joints to avoid cracking, which could compromise the structure. The enclosing of the structure has many opportunities, similar to the infill walls of the monolithic structure, but here a lightweight steel cladding system can be used with insulation (Schmidt, 2013, pp. 454-477).

The use of the steel framed structure in the project aims to minimize impact on the ground by being raised with columns, where only the footings disrupt the ground. This will create the lighter tectonic morphology of the project, imitating a tree canopy from a romantic landscape. The use of weathering steel will blend with the existing rocky outcrops on site (Figure 40), blending in with the natural colour pallet such as in Figure 41.

Figure 67 - *Lightweight Steel framed structure molding into the rocky outcrops (Jetson Green, 2009)*

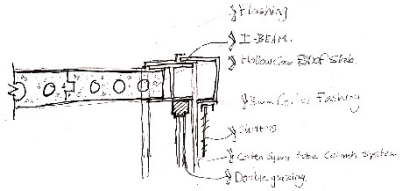
Figure 68 - *Steel raised structure (R. Wood, 2009)*

Figure 69 - *Oxidized rocky outcrop on site. (P. Vorster, 2019)*

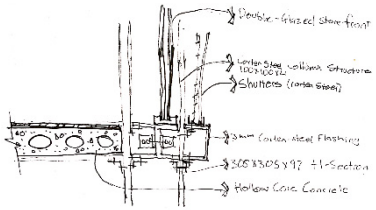
3.3.1– Floor and Roof Structure

The design makes use of a column structure which consists of four 100x100x4mm hollow square weathering steel sections. H-beams, 305x305x97mm, are fixed between the four square sections, holding the floor, walls and roof (see Figure70). This forms the basis of the structure.

Initially, the proposal was designed to make use of hollow-core precast concrete as the floor and wall elements of the raised steel structures, as seen in Figure 70. After close consideration, the use of the pre-cast elements seemed unreasonable. Firstly, in the case of transport to site and secondly the impracticalities of installing the concrete slabs within the H-beam without bending, damaging or breaking the fragile column structure. Further investigations ran through using permanent shuttering as a composite decking system for in-situ concrete, but the design took a final turn towards using a new materiality for the raised structures.



Roof detail



Floor detail

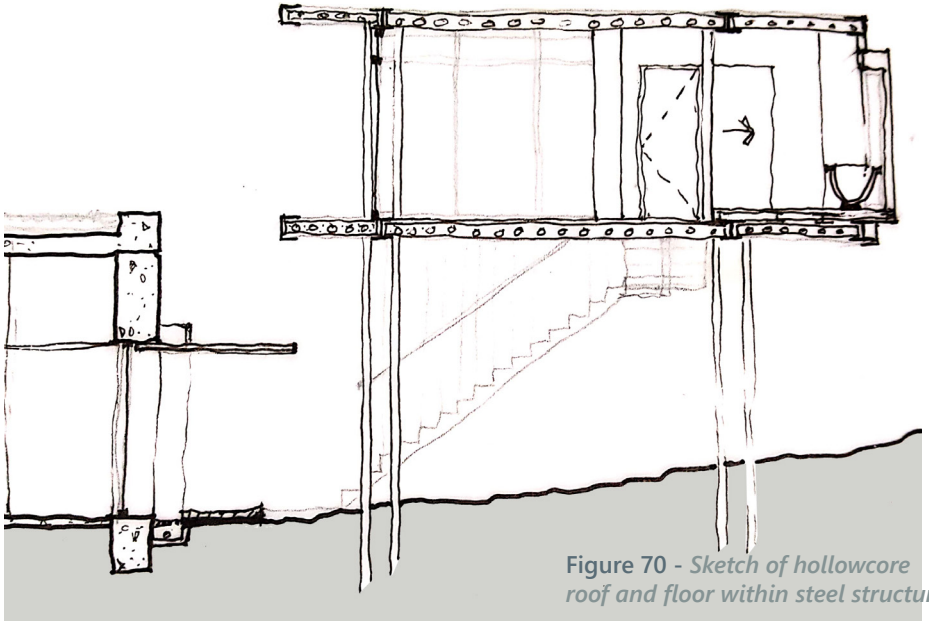


Figure 70 - *Sketch of hollowcore roof and floor within steel structure*

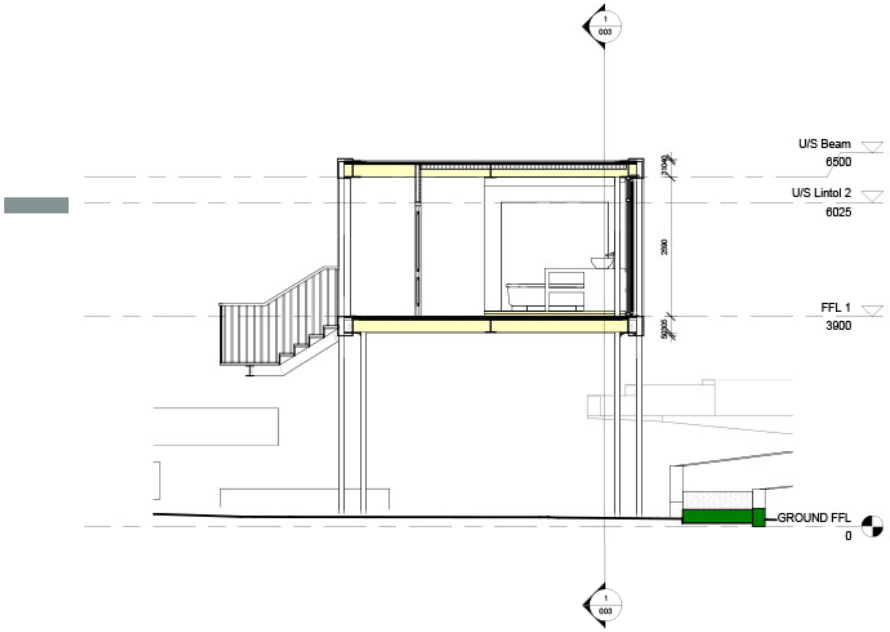
Plywood

Marine plywood is used as the floor, roof and wall paneling. By using wood based construction for the infill, the environmental impact of the construction materials is lowered significantly as timber has the lowest environmental impact as a structural material (Crafford, et al., 2017). Timber construction has been on the rise in the South African context in recent years due to its sustainability from 'cradle-to-grave' as well as it's faster build time.

Marine plywood is a composite of cross laminated hardwood timber veneers, but differs from ordinary plywood as it is bonded with water and boil proof glue, making the plywood boards more robust in the face of moisture (Hill, 2013). Marine plywood is thus used in harsh environments, such as on boat decks, and does not warp or crack in the extreme environment. Considering the diverse climate conditions of Bloemfontein, the marine plywood offers a strong resistance to the harsh environment.

Using Plywood for the interior walls trumped fiber cement, gypsum, or other boards, for two main reasons. Firstly, plywood holds screws and nails well in the case of internal decorating (picture frames) and secondly due to the variety of finishing options. The timber is varnished in some areas, leaving the timber grains exposed (providing a warm look), and is painted on accent walls for light reflection or visual comfort (Mistry, 2017).

The floor and roof consist of two layers of 18mm plywood fixed perpendicularly, for extra strength, on 228x50mm timber batterns, placed at 600mm center-to-center within the H-section. The roof will be waterproofed with torch-on Derbigum, falling to full bore outlets which expel the rainwater down one of the hollow sections which make up the column structure. The floor is finished internally with 2.5mm off-white vinyl sheets with a 13mm flexible leveling compound. All the composite wall and store-front glazing will be fixed directly to the H-section beams.



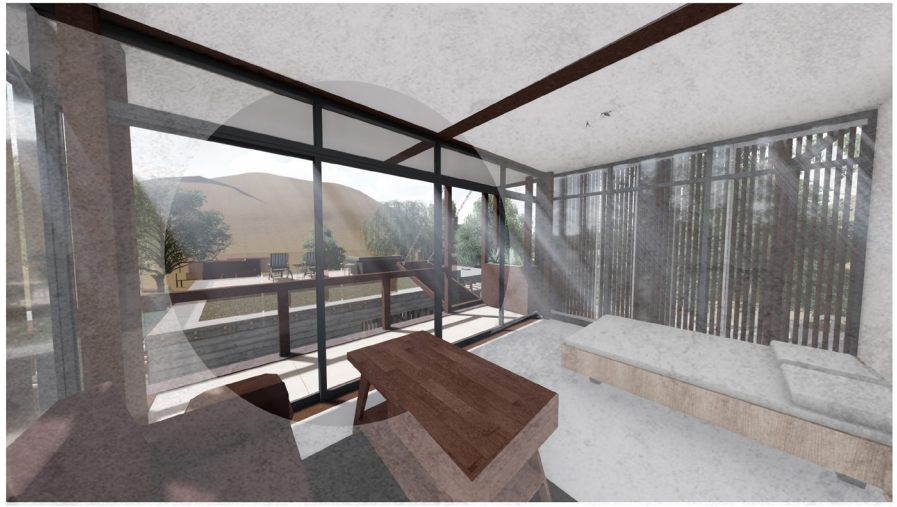
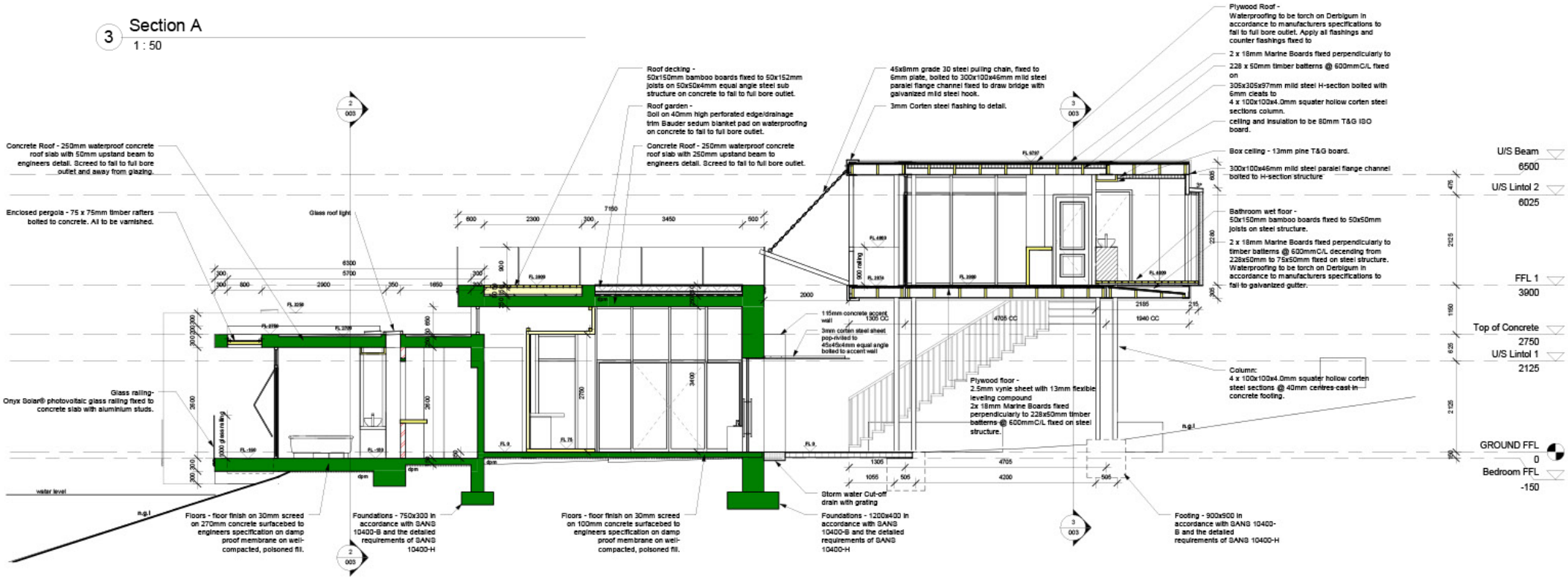


Figure 72 - *Interior prespective pf raised steel structure.*

3 Section A
1 : 50



1 Section 2
1 : 50

Figure 71 - *Sections of steel structure with plywood infill.*

For a president please see page 62-63.

3.3.2– Materiality of Weathering Steel

Weathering steel, or corten, is a low alloy but high strength steel which resists atmospheric corrosion by forming a dense rust layer, called a patina. The density of the patina inhibits penetrative corrosion thus maintaining structural integrity (Steel Construction.info, 2018). Weathering steel can either be pre-treated to induce the patina, via chemical sprays, or develop the patina naturally within the natural environment. For the sake of the proposal, the patina will be induced before installation, rendering an even rust patina throughout the proposal (Decker, et al., 2008).

Coating

Weathering steel can become unpleasant to the touch as the rust can rub off on skin or clothing. Designing with this in mind becomes imperative to protect the user as well as the patina from becoming damaged. The few elements of weathering steel within the units will be treated with a corten sealer supplied by Bromoco. The CT-7571-T clear coating for corten and bare carbon steel is a one paint application which protects the patina from acids, such as in bird droppings, and prevents rust run- or rub-off (Bromoco, 2015).

Figure 73 - *Stages of applying Bromoco clear coating.(2019: Adapted by author)*

Drywall structure

The wall structure for the raised steel units will consist of a lightweight steel structure with internal insulation. The exterior will be cladded in corten steel sheets, pre-treated and coated with Bromoco CT-7571-T, with marine plywood on the interior, as seen in Figure 45.

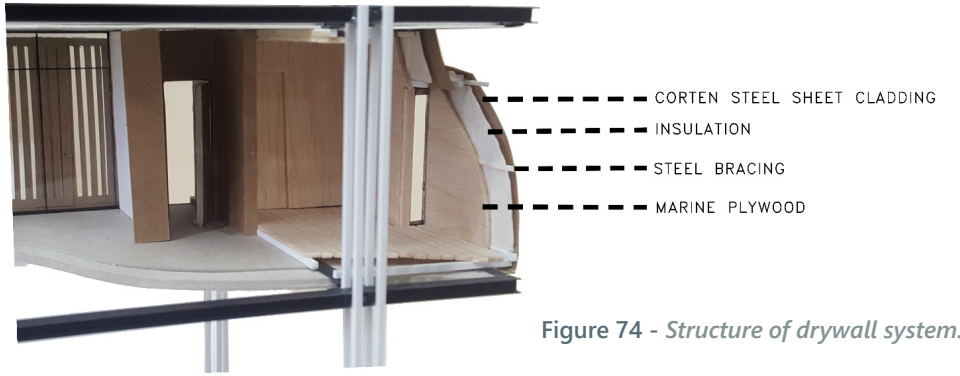


Figure 74 - *Structure of drywall system.*

Figure 75 - *Towards a final look of the raised steel structures.*

3.4– POLYCARBONATE CONSTRUCTION

Polycarbonate could be for the smaller meditation and gathering spaces, predominantly atop the existing structures. Polycarbonate is a light and durable material which has a higher heat resistance and thermal insulation than glass. Polycarbonate is usually accompanied by Aluminium framing, which provides structure. The light quality and diffusion from translucent sheeting is unmatched, with the lowered visibility both in and outwards, crating spaces in which one can escape and contemplate (Prabhu, et al., 2015).

The use of polycarbonate atop the existing structures will frame the existing whilst hinting at what could have been in the past. During the day, polycarbonate allows for the defused light to awaken the inside, keeping its thermal ability within, but at night creates a glow from the internal light outwards (ArchDaily, 2018).

After consideration, polycarbonate is not used in the project, as a visual link to nature through clear glazing aligns more tightly to the essence of the proposal.

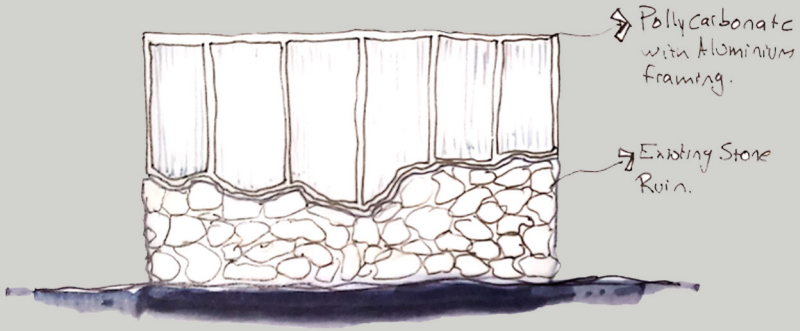


Figure 76 - *Proposed use of Polycarbonate construction.*

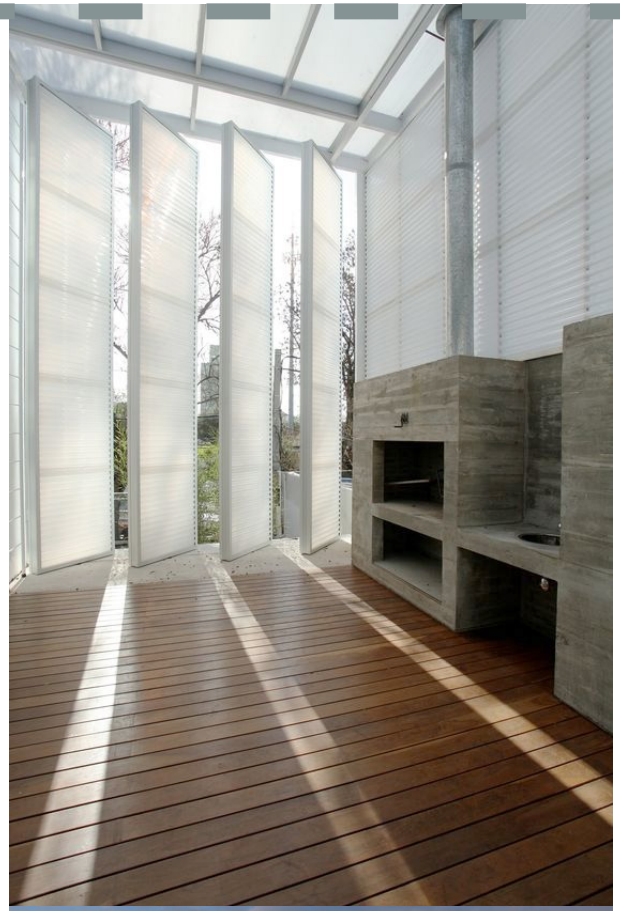
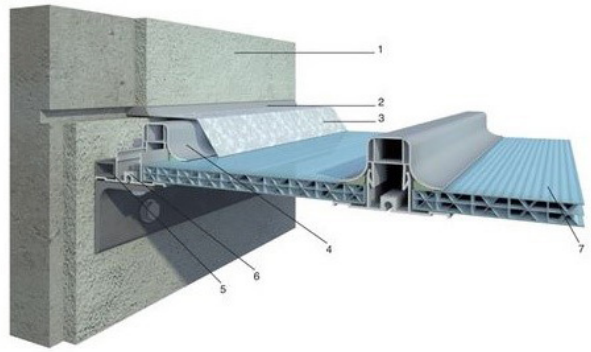


Figure 77 - *Factory-inspired "Mobile ruin" (L Brotherton, 2016)(online)*

Figure 78 - *Details of polycarbonate to concrete (Top) and the connection with stainless steel framing (Bottom). (online)*



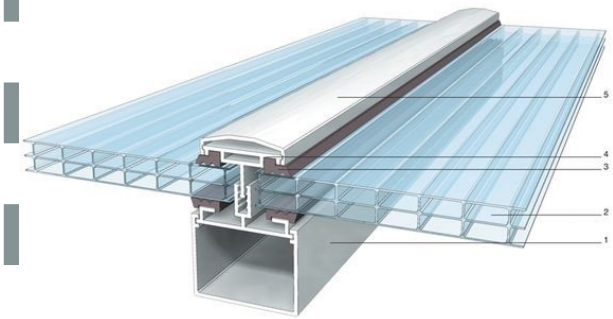
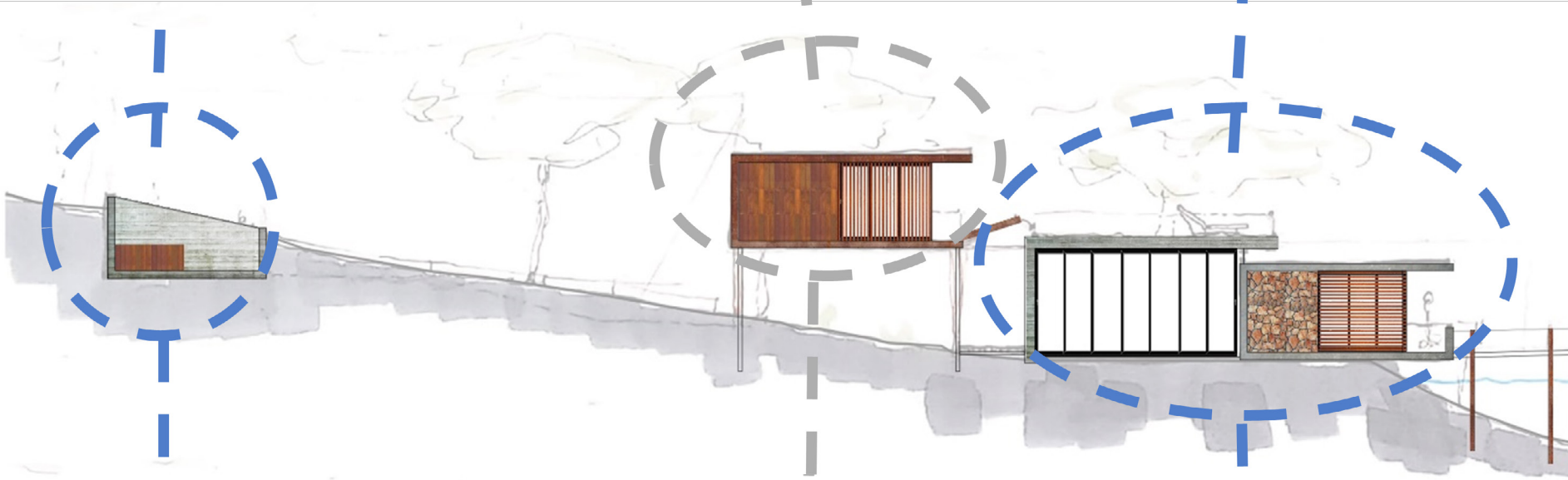
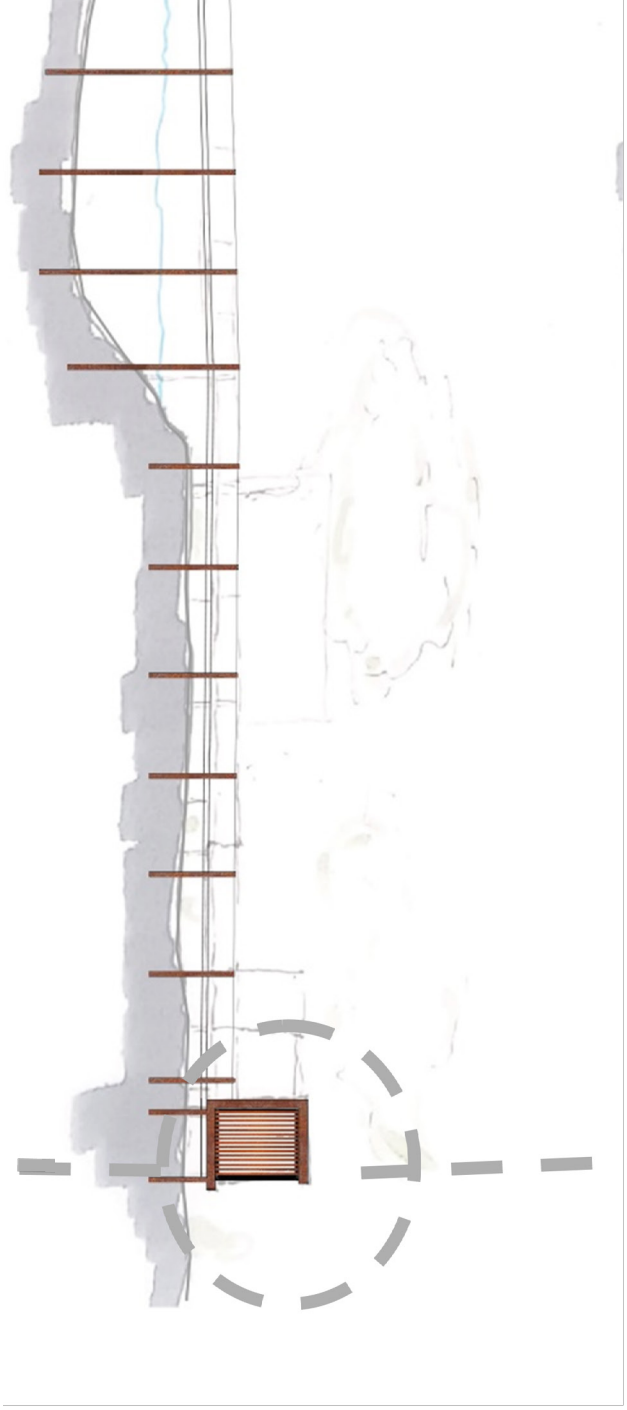


Figure 4 A cosy entertaining area, Cara Slater-Middlewick. (Henrique Wilding, 2016) (online)

Figure 3 New Guest Pavilion by This Is Arquitectura, Spain. (Adria Goula , 2017)(online)



STEREOTOMIC **TECTONIC** **STEREOTOMIC**



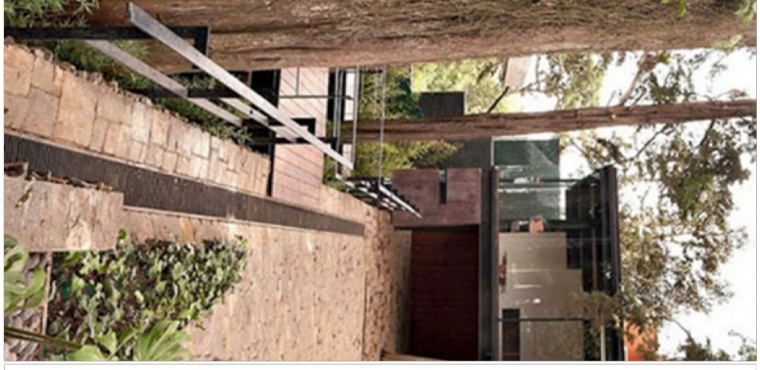


Figure 2 Corallo House by PAZ Arquitectura, Guatemala. (Andrés Asturias. 2012)(online)

Figure 1 Delta Shelter by Olson Kundig Architects, USA. (Tim Bies, 2015)(online)

3.5– Project application

4—SERVICES

The services required for designing a Medically Supervised Water Fasting Centre presents many obstacles. Fortunately, these can become opportunities when investigated in detail. There are two main categories of services: one for the clients, and the other for the employees of the Centre. The employee services will be split between the doctors and staff. Here we can already see the implications needed to create a successful Centre which is well equipped and serviced efficiently.

Because the Design aims to create a closeness to nature, the services, such as wastewater and water supply, should be designed and dealt with in creative ways which can become elements of education, rather than tucked away systems.

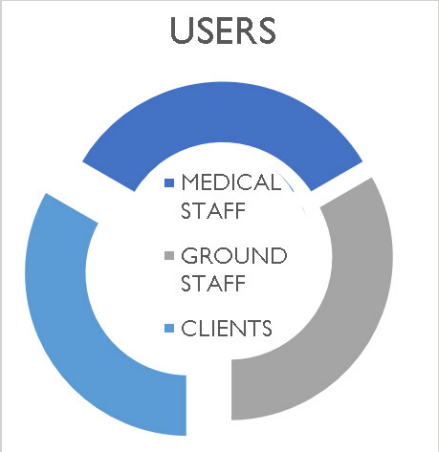


Figure 79 - *Diagram of users*

4.1— Fire Control and Circulation

The proposal is near a water's edge and a marshy floodplain with few extending corridors or large buildings. Thus fire escape will be on foot through the open, unenclosed walkways to designated safety areas. The living units abide by the escape door being within 45m from each point and will not be overpopulated. The doctor's quarters (double story) has two possible escape routes directly to the outside, again within 45m of the furthest point. The first escape is directly onto the outside whist the second is a staircase which is 1.5m wide with handrails, exiting into a lobby area and then to the outside. According to SANS 10400 Part T, an emergency escape route is not required because the double story building will not have a population of more that 25 persons and the living units escape directly to ground floor. The capacity of the lecture hall is less than 25 persons and thus a single escape door will suffice. In order to comply to SANS 10400 Part T-Fire Protection regulations, extinguishers and watering systems will be put in place and maintained as per law along with fire doors.

Part D of SANS 10400 – Public Safety regulations will be implemented, and the design will be universally accessible where necessary. Part D4 – swimming pools and swimming baths is closely adhered to.

4.2– Specialized Requirements

Test Laboratory

The program requires a small laboratory which will perform basic urinalysis and blood tests. A nurse's office is provided, where the blood samples can be drawn and then examined in the test laboratory. The machinery for both the urine and blood test is a desk size machine which is the size of a printer (see Figure 50). The machines require plug points but are simple in application and storage, requiring very little space (Fareed, 2019). The lab as well as the nurse's office will include medical waste disposal bins and wash up basins with space for antiseptic wash. If need be for more complex tests, the blood will be drawn on site, in the nurse's office, and delivered to the larger medical facilities for further assessment.

Sauna

A sauna is typically defined as a small room which is heated to between 65° and 90°C with varying humidity. Historically, saunas were heated by rocks which had been warmed in a fire, and water could be thrown over them to create steam, but now are electrically controlled (Wilson, 2019). The proposal contains two single units of 4.2x2.8m, which have an entrance and sauna area. The design utilizes an under seat electrical heating unit, which has a control panel in the entrance for the temperature, humidity, timer and sound system. The proposed system is from Steamtec®, model TOLO-W45, which is an all-inclusive system with light, aroma, heat and steam control via a wireless control panel. The full system is 425x160x300mm. The system controls a room volume up to 5.5m^3 with a power point of 220v (Tinty, 2016).

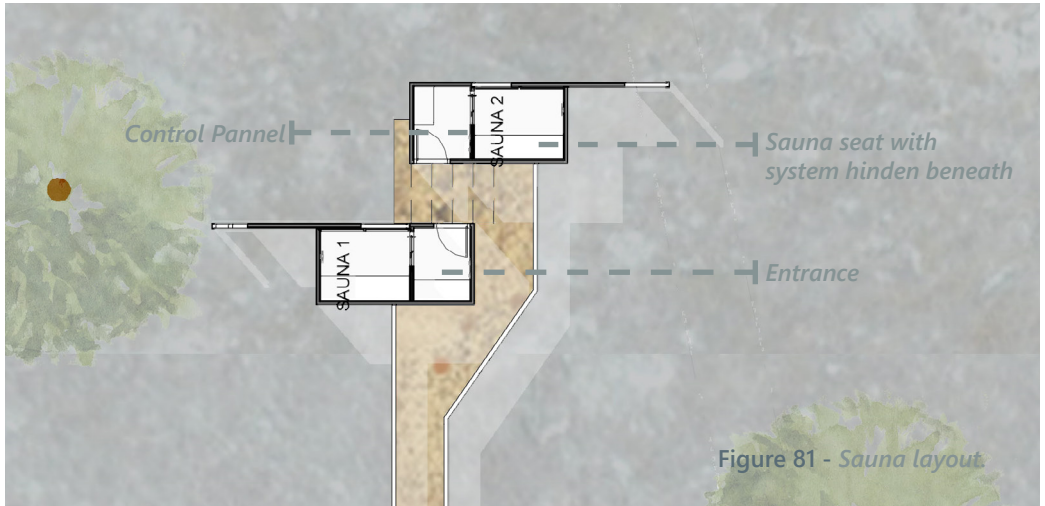


Figure 81 - *Sauna layout*

Figure 80 - *Basic Urinalysis machine (Online - www.marketlab.com)*

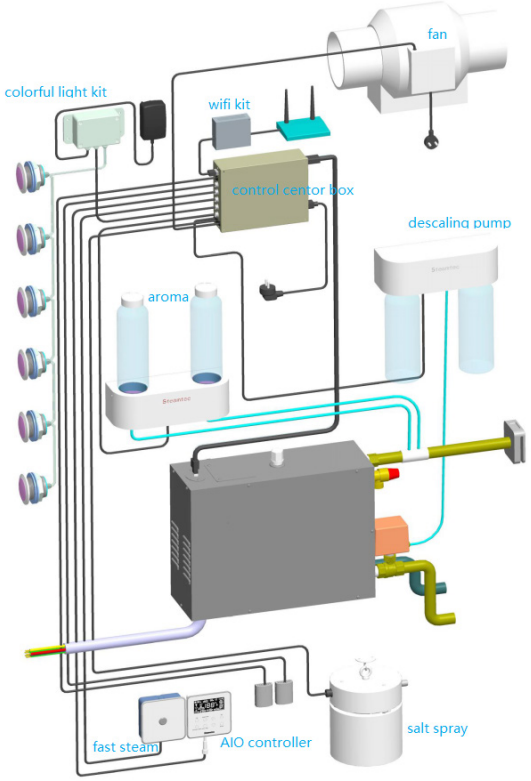


Figure 82 - *SteamTec® model TOLO-W45 system. (Online - saunasteamgenerator.com)*

Float Tank

A float tank is a meditative room where a single user floats in warm shallow water which has a high mineral and saline content The floatation allows for complete relaxation as the high mineral content increases buoyancy and makes floatation calm. The design can either be a "pod" in which the user climbs into within a room (usually as a sensory deprivation tank, see Figure 52) or as a chamber in which a shallow basin is placed, such as in this design (Eykelbosha & Beaudet, 2016).

A float room has different requirements, which have been set out by the Washington State Department of Health. The tank is designed to be a minimum of 1.7m x 2.4m x 0.3m. The proposal uses a tank of 2.4x1.6m within . The water is to be a saline content of 1.37 salinity per cubic cm at a temperature of 34x35°C at a minimum depth of 250mm (Washington State Department of Health, 2017). The water must be filtered continuously, except when the tank is in use, and the water replaced every 3 months. Many different filtration options are available, the filter used in the design is the Orbit-Float filter. The filter is 650x800x875mm with a 22amp connection. The filter can fit under a 'bench' like structure within the room, where the control panel can be easily accessible (Figure 53) (Orbit Float, 2018).

The room must accommodate a bench to undress, a storage area for headrests, hair caps and ear plugs for the user, a shower to wash off the excess Epson salts and a towel hook or rail. The floor should be a non-slip wet floor which drains to an outlet (Eykelbosha & Beaudet, 2016).

Figure 83 - *Sensory deprivation float pod (Online - stchd.com)*

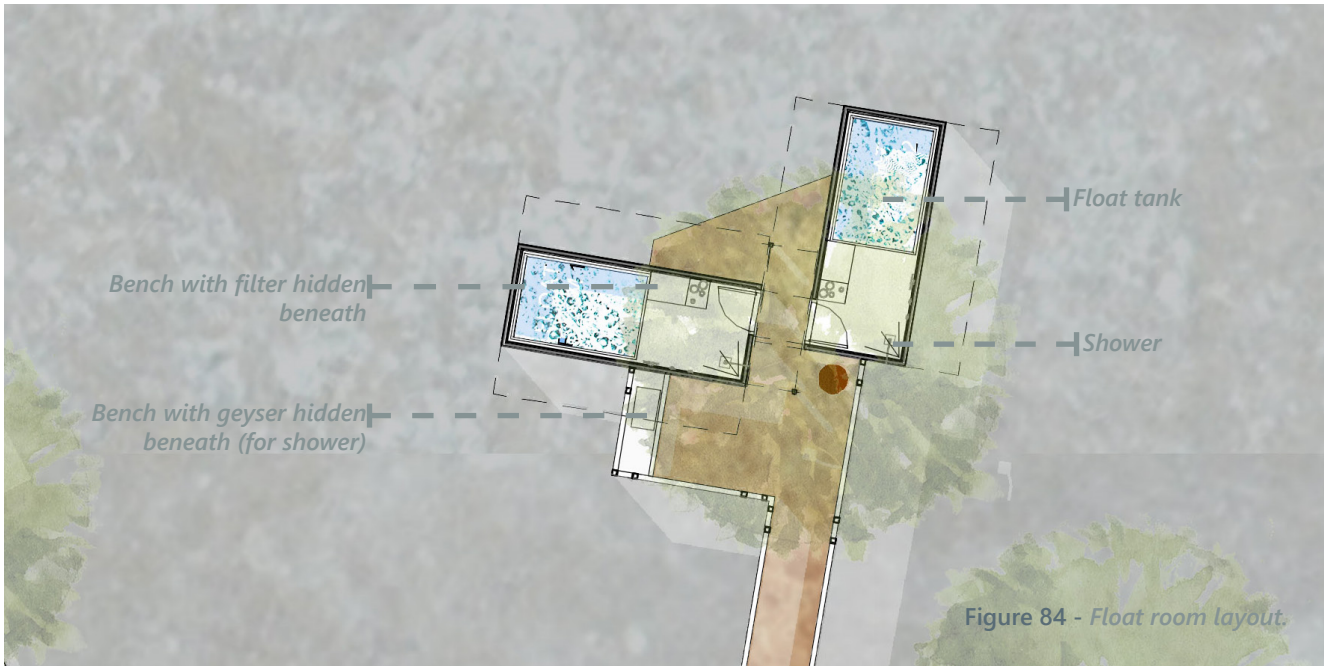


Figure 84 - *Float room layout.*

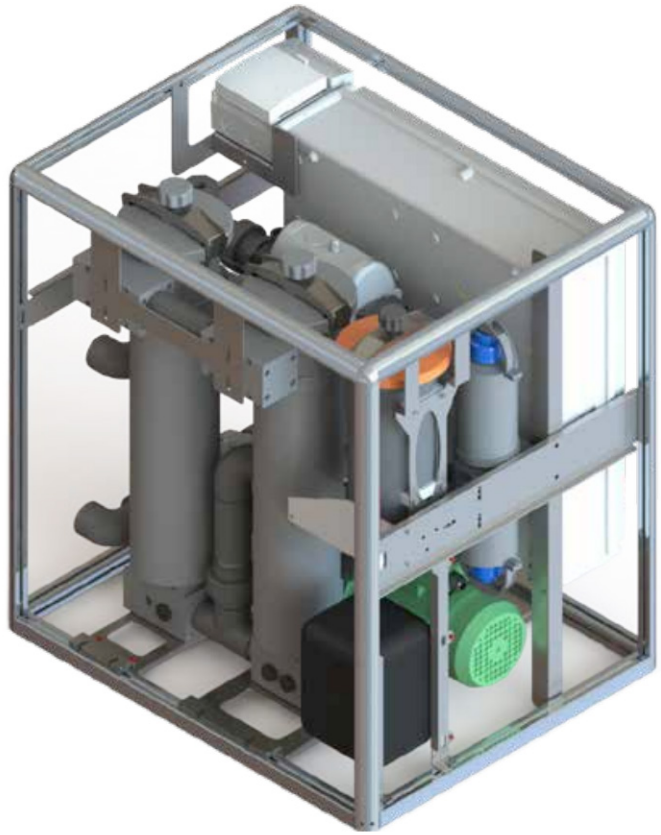


Figure 85 - *Orbit-Float Zero filter. (Online - orbit-float.com)*

Emergency Warning Systems

The safety of the patients will be of utmost concern and thus the centre will be fitted with emergency systems such as panic buttons and alarms in the living units, isolated reflection areas as well as on the walking pathways. These will ensure that if a patient is to fall or become weak due to the fasting, medical help can be alerted immediately and action can take place.

4.3– Electricity Supply

Some Photovoltaic Collectors will be implemented in the proposal, but will not be possible over the roof structure, as there are clear visual lines to the roofs, and some roofs are inhabitable. Photovoltaic glass railings will be used instead. Thus energy use will need to be maintained through the use of energy efficient appliances and systems to lower the use of national grid power throughout the building.

Heating Water

The appliances' which use the most electricity are typically those which generate heat, such as tumble dryers, toasters and geysers. In a typical South African home, a geyser can make up as much as 35-60% of the monthly electricity use (UberSolar, 2017). The proposal considered this use, but has alligned toward a greener aproach by proposing to eliminate this energy use from the municipal grid, and replacing it with solar energy.

The use of a heat pump for water heating is very energy efficient and effective, yet it seemed unpractical within the context of the proposal. A heat pump should be connected to the geyser/storage cylinder and placed on an exterior wall, with enough open air surrounding it (2.5m radius) in order to be effective. The possibility of using a heat pump at each unit could become unsightly, along with the added noise pollution a pump offers, would not encourage a calm stress-free environment. If the heat pump was to be centralized, within a pump room, a closed circuit/ring main would be used. Thus meaning that a constant circulation of hot water would be circuiting the proposal, challenging the ease of switching off the supply to a single unit. Apart from the unpracticality of closing hot water supply to a vacant unit, the heat loss would be notable (Venter, 2019). Therefore, the proposal will use solar water heating photovoltaic (PV) systems.

Solar Water heating photovoltaic (PV) systems

The water heating system differs from the conventional solar thermal heating systems, as it does not circulate water through UV collector pipes, into a storage cylinder, but uses power form three PV panels (for a 200L geyser) to heat the water with a PTC element. Thus, the energy generated from the PV panels is directly connected to the heating element, with no need for pricy batteries, as seen in Figure 54. The element functions similarly to a conventional geyser element. Any geyser can be converted by replacing the existing element with the new PTC element (Matuska & Sourek, 2017). Bloemfontein is considered a high irradiation area and thus has the capability to generate higher energy levels from photovoltaic collectors (Geyser Wise, 2015).

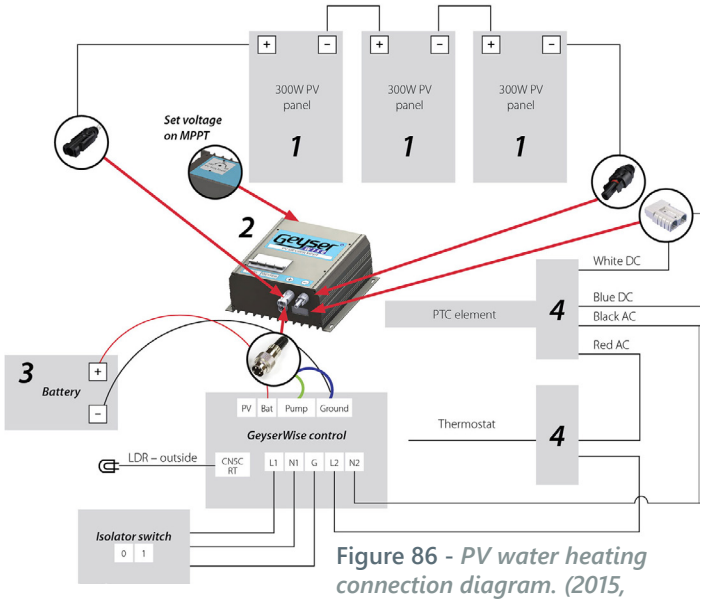


Figure 86 - *PV water heating connection diagram. (2015, online: geyserwise.com)*

Photovoltiac Glass

As previously stated, the use of PV panels will not be atop the roofs, but will be in the form of photovoltaic glass railings. The glass will be amorphous silicon photovoltaic glass supplied by Onyx Solar®. The PV glass has different degrees of transparency and offering different degrees of privacy. The thermal glass has high efficiency in diffused light environments. The glass has been used in a Spanish home as railings and has proved effective in energy production (see Figure 55)

Figure 87 - *Photovoltaic railings in a private residence located in Avila, Spain. (online www.onyxsolar.com)*

Figure 88 - *Perspective of amorphous silicon photovoltaic glass railings.*

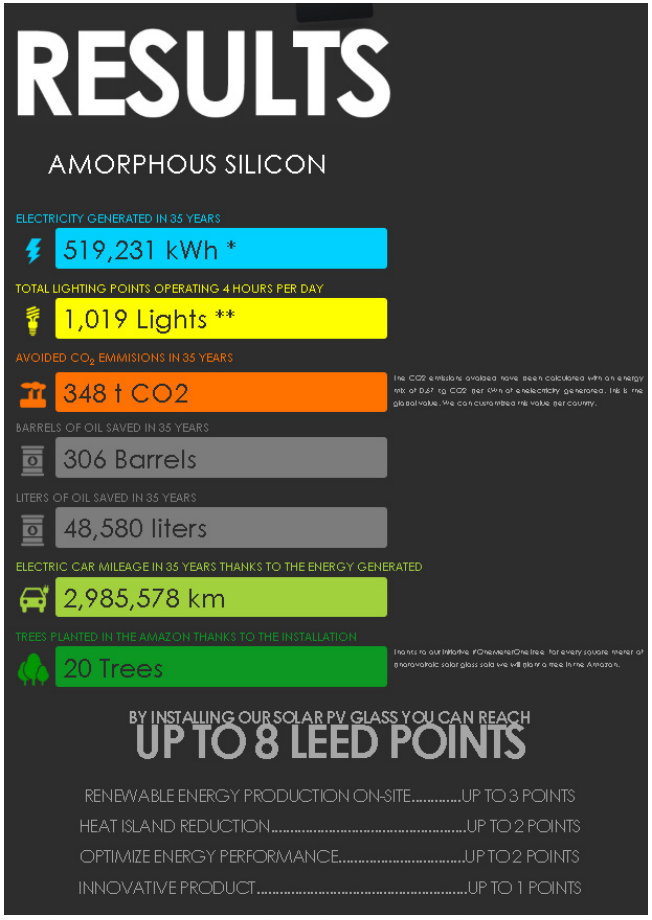


Figure 89 - *Estimated power out-put from the amorphous silicon photovoltaic glass railings of a single unit. (online - www.onyxsolar.com)*

4.4—SANITARY SYSTEMS

As the design requires a closeness to nature, biological wastewater treatment systems have been designed to manage wastewater from the scheme, despite the existence of municipal drainage facilities on site. Considering the patients' dietary restrictions, the stress on a wastewater treatment system will be significantly less due to the lowering of solids in the wastewater.
Considering the proximity of the scheme to the river, the use of French drains will not be efficient because of the possibility of ground water pollution. The purification system implemented does not propose a threat to the surrounding environment.

The Omega Center for Sustainable Living in Rhinebeck New York, by BNIM Architects, 2009, developed a biological wastewater treatment system which efficiently treats wastewater produced by the building and reintroduces it back into the ground water, as well as reuses the water. The engineered system, Eco Machine™, has replaced the existing wastewater system for the 119 buildings on the 79-hectare campus (Berkebile & McDowell, 2010). The Eco Machine™ can processes approximately 19 million liters of water a year, and is efficiently processing between 150 000 – 200 000 liters per day, reintroducing the 23 000 annual visitor's grey and black water back into the ground water safely and efficiently (Omega Center for Sustainable Living, 2012). The process has 5 steps and is as follows:

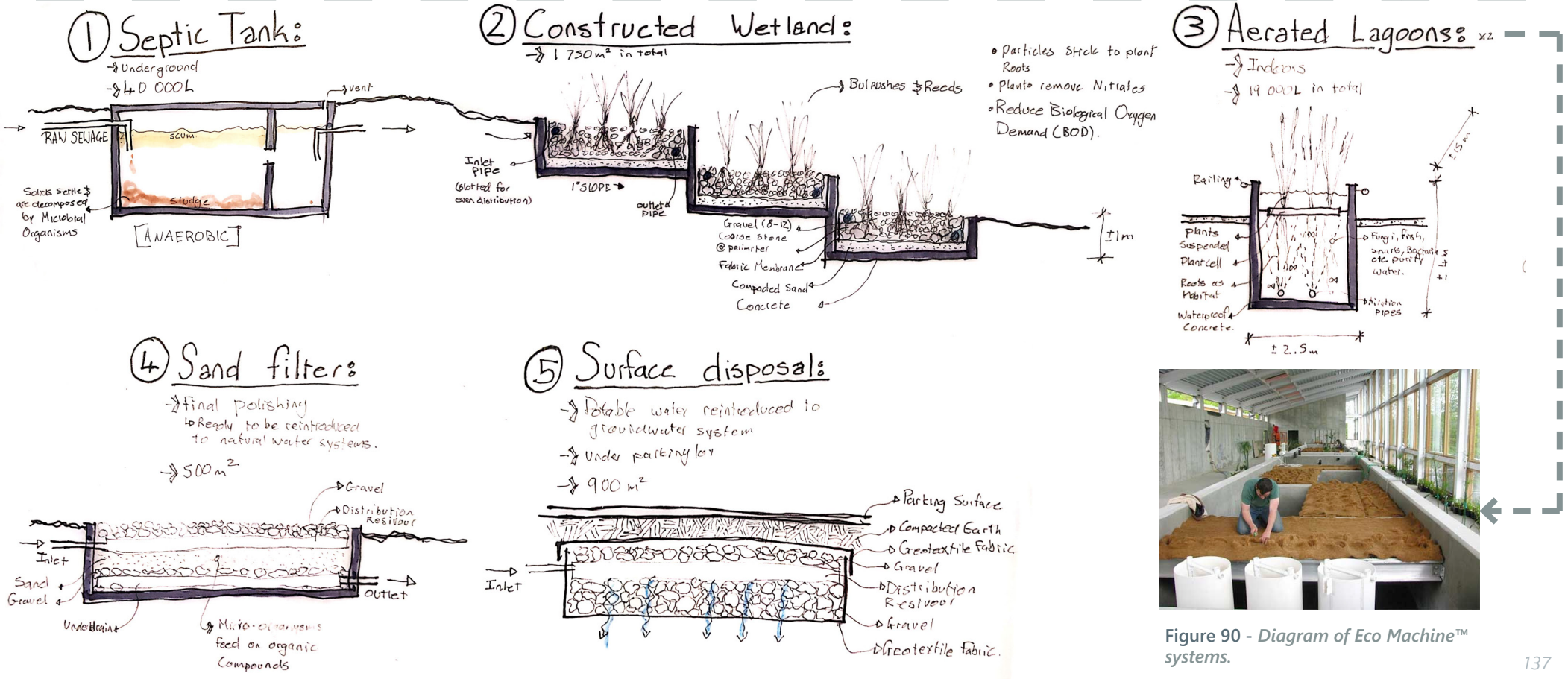


Figure 90 - *Diagram of Eco Machine™ systems.*

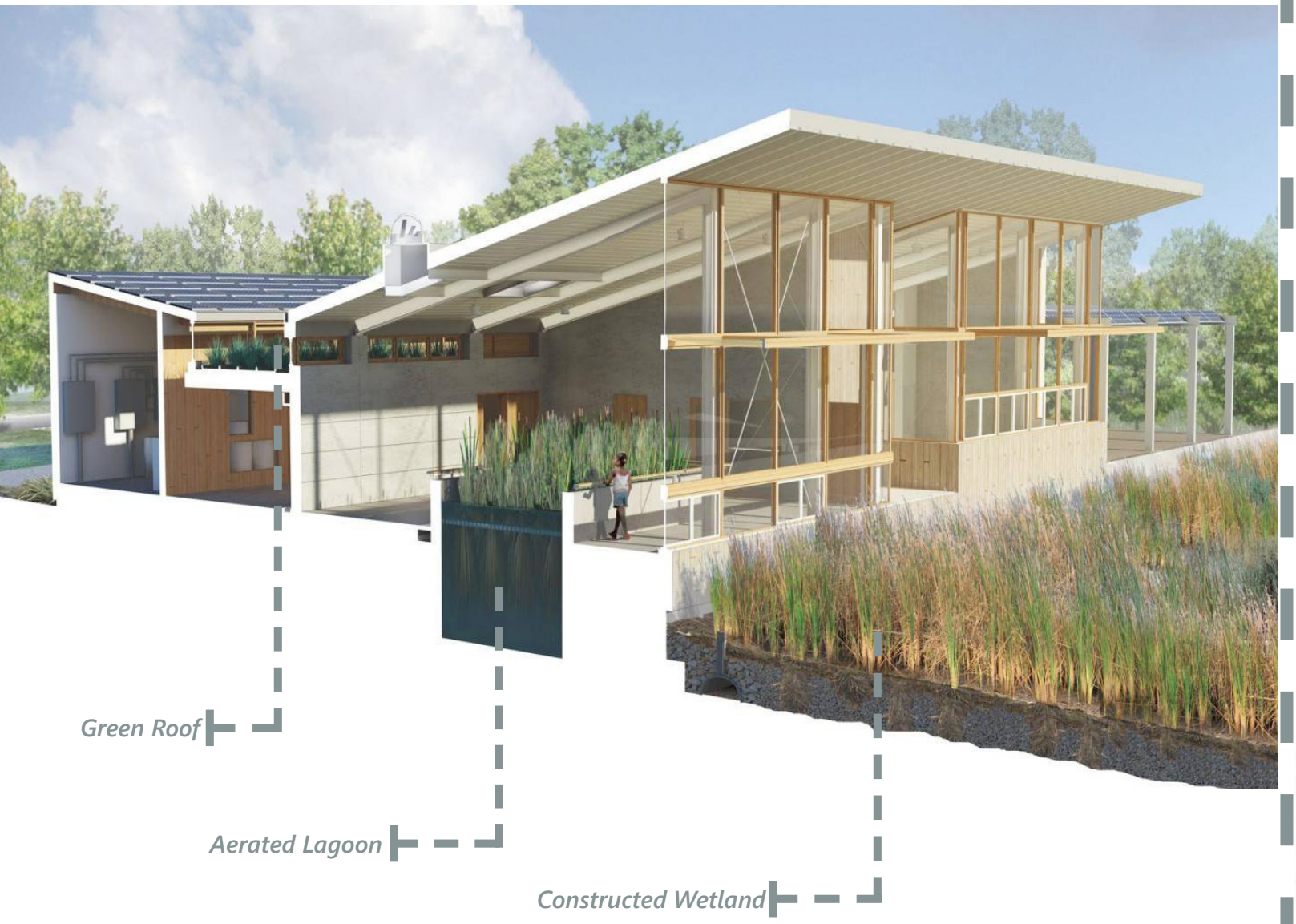


Figure 92 - *Sectional Perspective of The Omega Center for Sustainable Living Eco Machine™. (2009-Omega, online:www.eomega.org) (online)*

SITE PLAN **1** SEPTIC TANKS (below grade): In this first treatment step, the majority of suspended solids settle out of the water. Naturally occurring microbial organisms living in the water work to digest the sludge that settles to the bottom of the tanks and the now partially clarified water is skimmed off into the Anaerobic Tank. **2** ANAEROBIC TANK (below grade): Here further settling and a process known as anaerobic digestion occurs. **3** CONSTRUCTED WETLANDS: Here the water flows through the root structure of wetland plants. The plants remove nitrates and reduce the Biological Oxygen Demand (BOD - a measure of the rate at which biological organisms use up the available oxygen) and suspended solids in the water. **4** AERATED LAGOONS: In this step, additional wetland plants are suspended in an Aerated Lagoon. In a symbiotic relationship, the plant roots act as a habitat for microbial populations that further scrub the water. **5** SAND FILTER: This stage is the final "polishing" of the water prior to being reintroduced to the environment. Microorganisms living on and between the grains of sand are fed by any remaining organic compounds in the water. **6** SUBSURFACE DISPERSAL (below the parking): At this stage the water is reintroduced to the soil via a subsurface network of chambers. The chambers are "flooded with the processed water and allowed to percolate into the soil. **7** RAIN GARDENS: Water shed from the building roof is temporarily detained here during a rain shower while plants work to cleanse the water of contaminants before it enters the Rainwater Cistern or is absorbed into the soil. **8** RAINWATER CISTERN: Water is stored here before being used for toilet flushing and other nonpotable uses at the OCSL. **9** MECHANICAL AND ELECTRICAL ROOM: This is the location of inverters for the PV system, rainwater system, and equipment for the eco-machine. Supporting the pedagogical nature of the project, windows between this room and the Lobby expose the inner workings of the building systems. **10** LEARNING LAB: Part of the classroom, this area provides a place for visiting students (everyone is a student here) to perform tests and experiments on the water. **11** WOODLANDS RESTORATION: Future projects will restore the woodlands surrounding the OCSL and elsewhere on campus to their natural state.

Figure 91 - *Site Plan of The Omega Center for Sustainable Living Eco Machine™. (2009-Omega, online: www.eomega.org) (online)*

After calculating the presumed wastewater production for the proposal, an accurate assumption as to the size of the wastewater treatment plant is derived, as seen in Table 1. The main difference being that the proposals will not enclose any part of the 'Eco-Machine' nor will it be returned to the ground water but returned to the river. A water and sanitation specialist is employed to specify and design the full system to ensure its effectivity and efficiency along the specifications and requirements of SANS 10400 part P, Drainage.

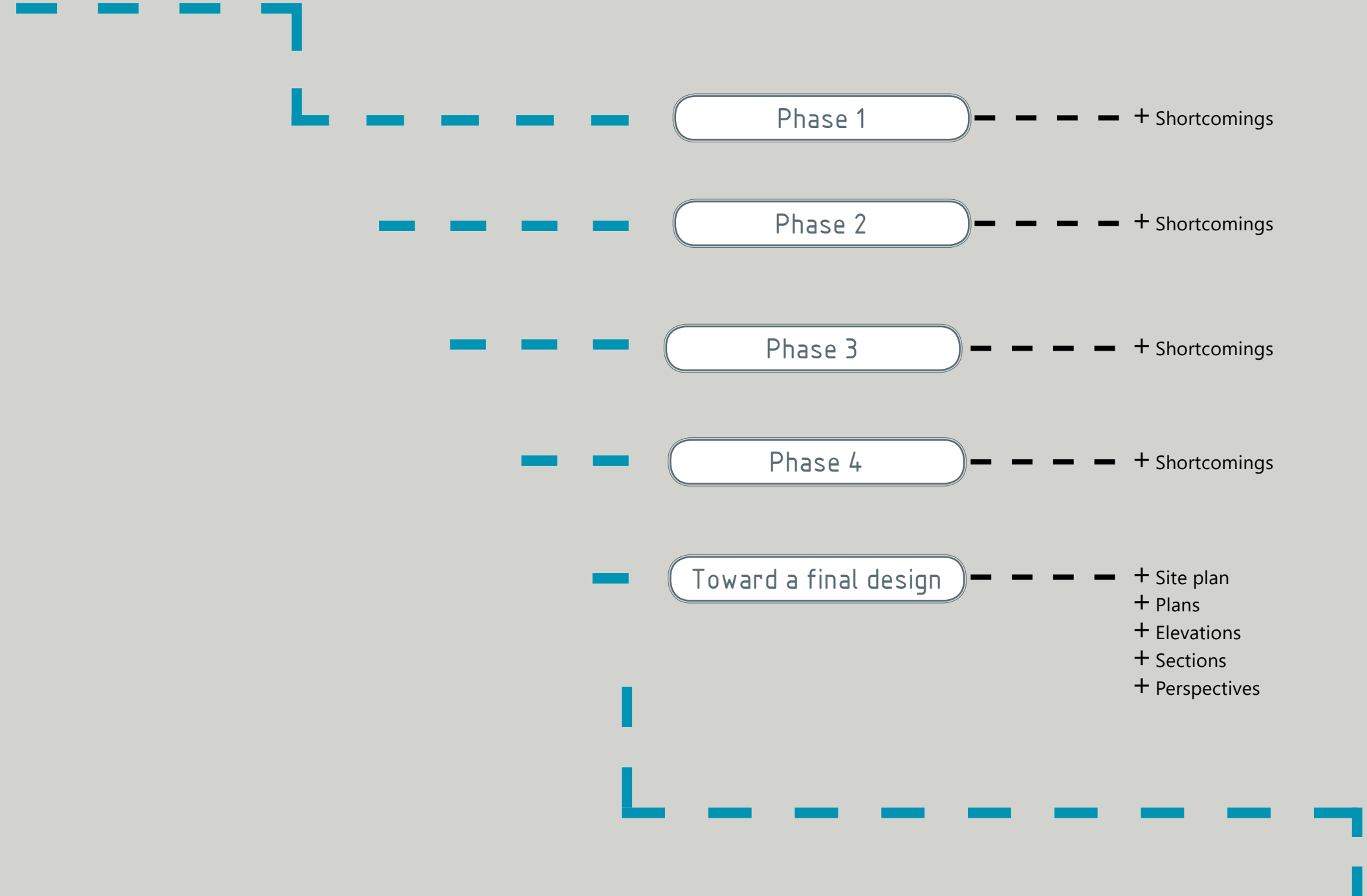
Waste produced per day (max)	200 000L wastewater (OMEGA)	20 000L wastewater (PROPOSAL)
Septic tank	40 000L	4 000L
Constructed wetlands	1 750m^2	200m^2
Aerated Lagoon	19 000L	2 000L
Sand Filter	500m^2	250m^2
Surface Disposal	900m^2	250m^2

Figure 93 - *Table showing wastewater treatment sizes as per step. (P. Vorster, 2019)*

PART 5

DESIGN AND TECHNICAL SYNTHESIS

+ This section discovers the design process which explores concepts influenced by the prior research which results into a final design proposal. The development of the design was, in fact, interwoven with the exploration and grounding. Thus the influence of in-depth site analyses and precedent studies provided more holistic approaches as the design develops.


Phase 1
+ Shortcomings
Phase 2
+ Shortcomings
Phase 3
+ Shortcomings
Phase 4
+ Shortcomings
Toward a final design
+ Site plan
+ Plans
+ Elevations
+ Sections
+ Perspectives

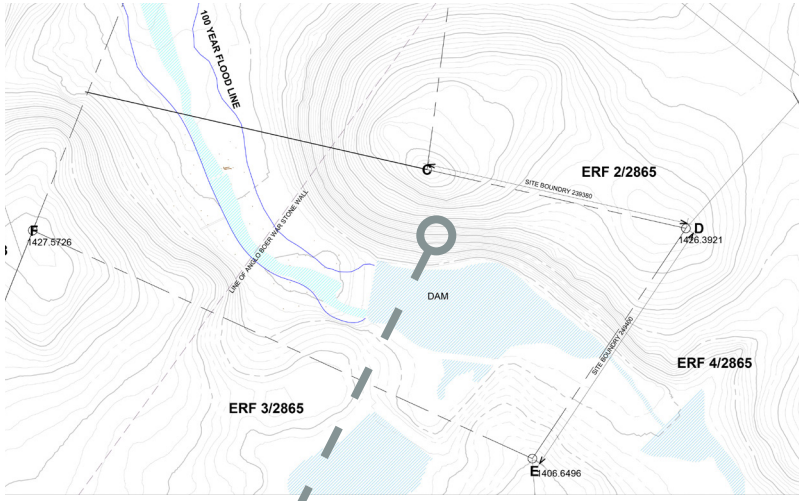
PHASE 1

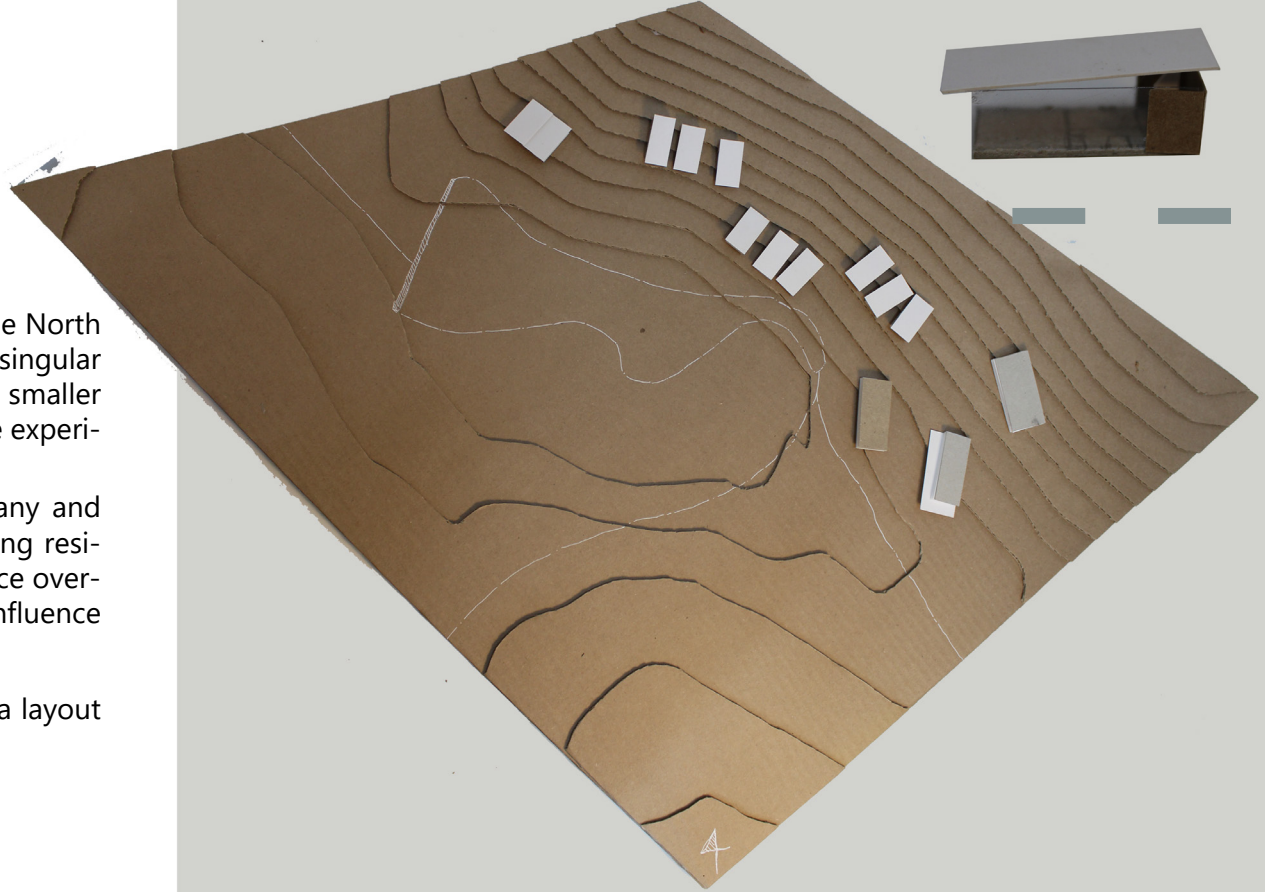
Initial design exploration

The initial approach to the design opposed the case study of True North Wellness centre (Page 51), by fragmenting the typology of a singular building with a centralized courtyard. Breaking the building into smaller masses provides space for nature to become an integral part of the experience, as well as ensuring a 'hospital' typology is avoided.

Research and conducted interviews outlined the need for company and human connection through a fast, this was translated into grouping residential units together, with a common living space. Each living space overlooks the natural landscape, with large glass façades inviting the influence of nature into the buildings.

The exploration was performed through a massing model, with a layout of the proposed program.





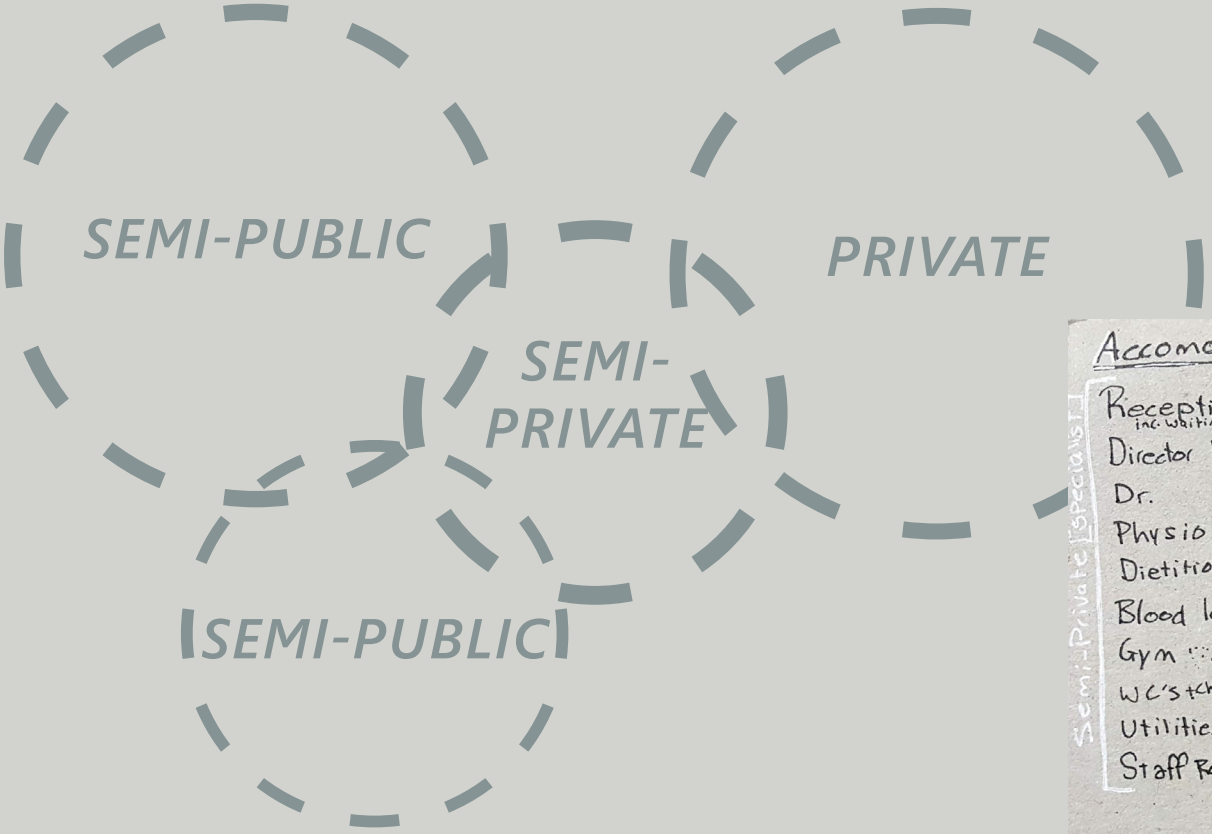
The naive approach failed for two main reasons. The first is the orientation. The hill sloped to the north, which would result in very little natural light and cold rooms, which would struggle to employ passive heating due to low direct sun radiation. The second is that site selected was directly in the line of site from most pathways within the 7 Dams Conservancy. This is not only a privacy issue, but would go against the theory of the conservancy being a natural liminoid from the concrete jungle.

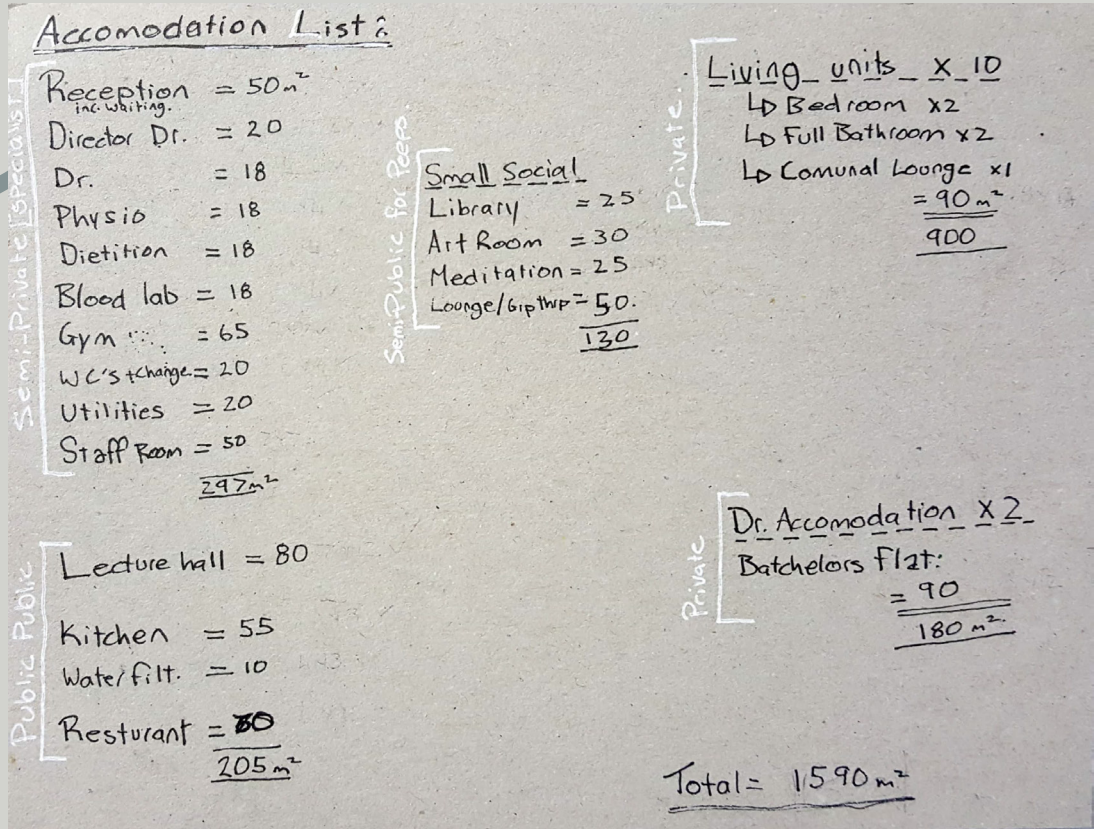
PHASE 2

Initial Accommodation list

The accommodation list was generated via research, including the case study of the True North Wellness Centre.

Levels of privacy were determined which would further drive programmatic layout.



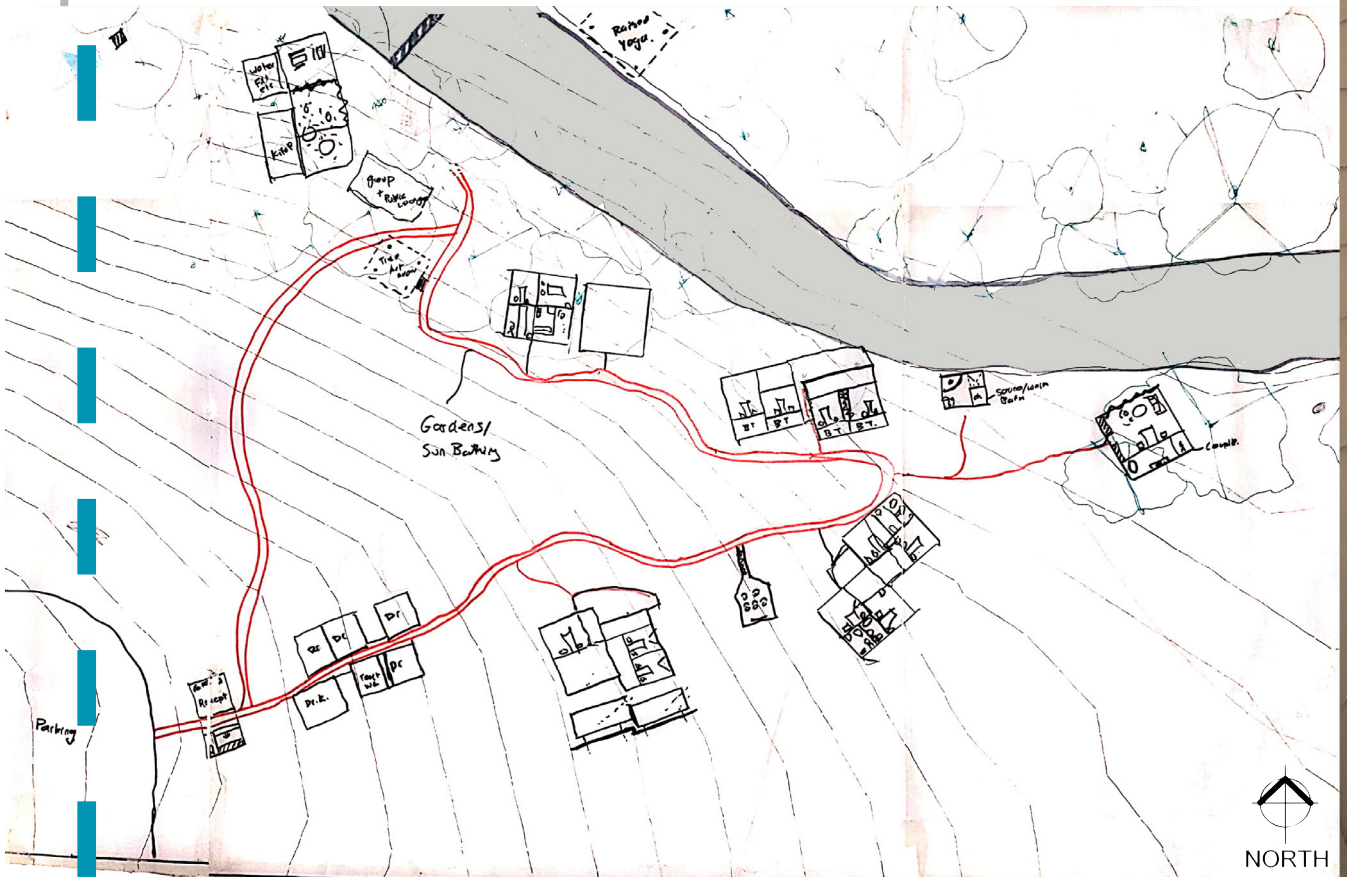


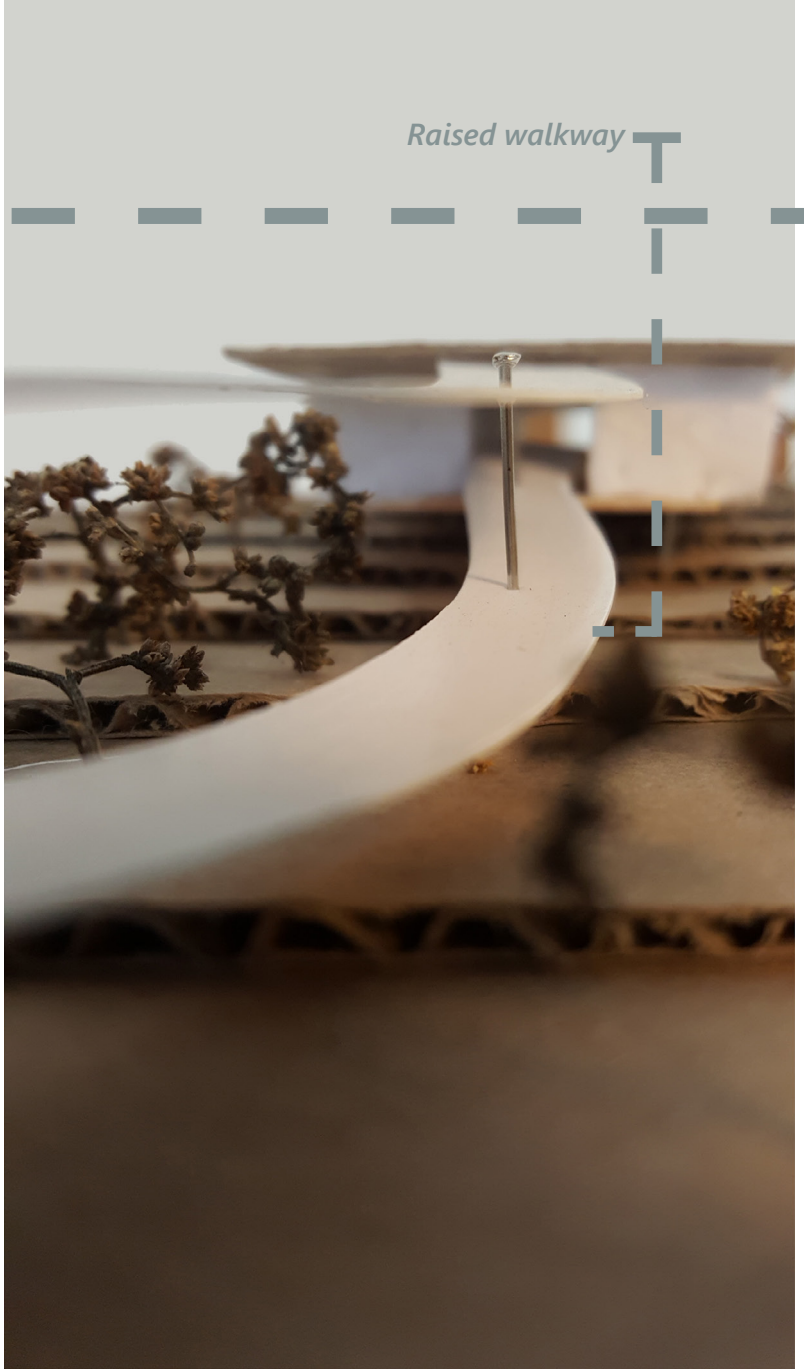
TOWARDS A RITUAL

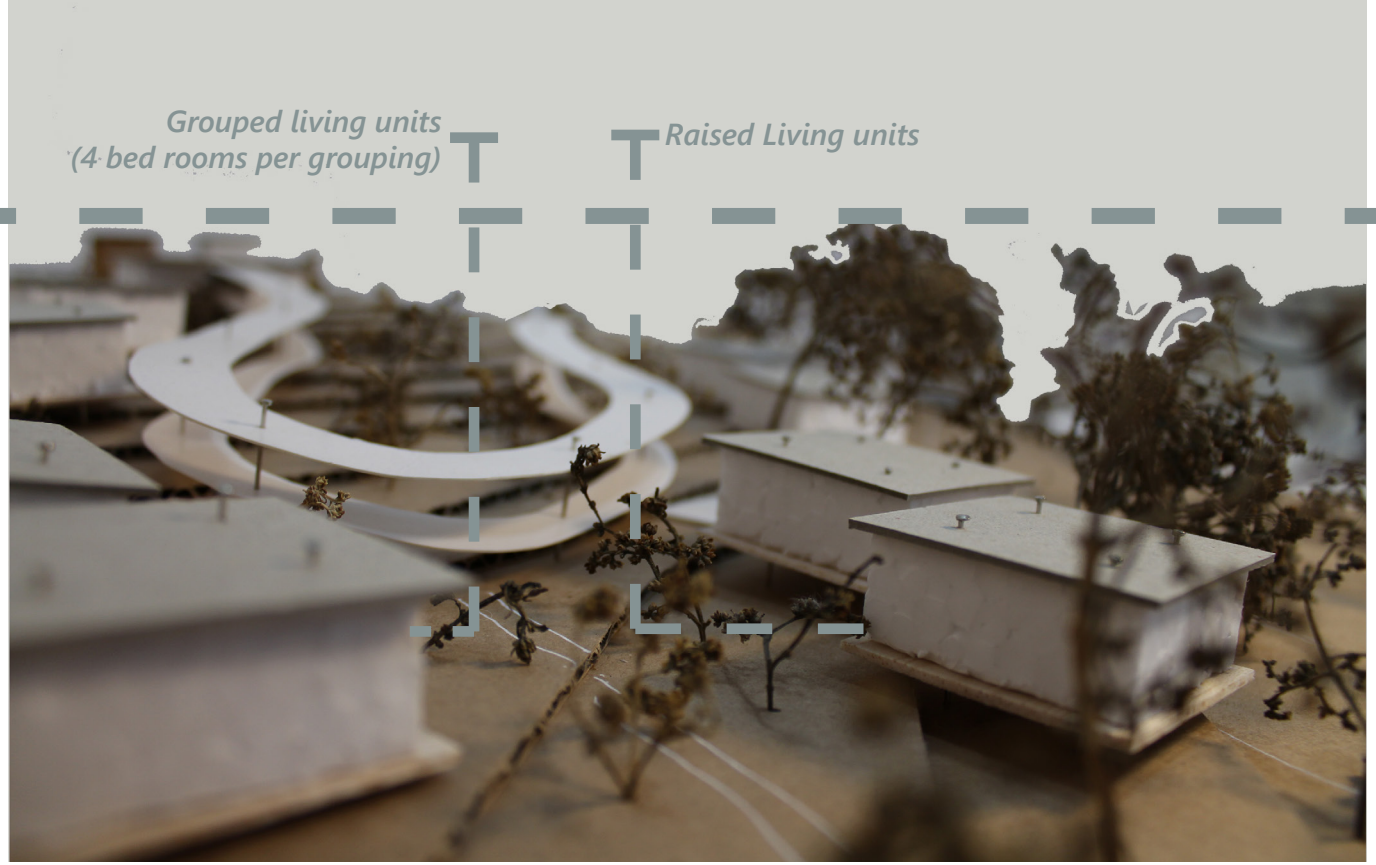
The development of the second phase focused more on designing a ritual in which one can explore the proposal as well as the site, i.e. Nature. The path is the linking element of the design, as it begins with the doctors labs, and ends with the communal lecture hall and dining for re-feeding clients. The free form of the pathway pays tribute to how one would have naturally meandered through nature on site, with the buildings grounded where the least natural vegetation would be disturbed.

The living units are placed along the path, showing the connection to living within the liminal journey. The smaller semi-private communal areas too are along the pathway, offering a proposal of chance encounters between fellow fasters.

The entrance, which is the doctors rooms, is designed as to be a flagpole of the design. It becomes the start and the end of the design. This is because of the practical need for clinical evaluations prior to entry, and upon exit.







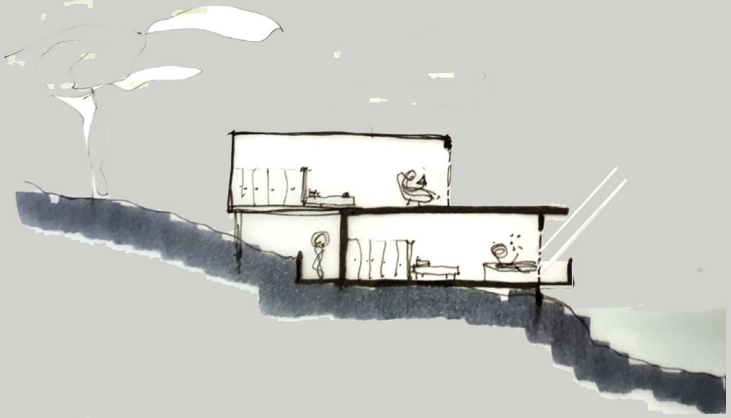
Whilst the orientation improved, the direct translation of a nature walk proved complicated and impractical. The pathway becomes elongated and tedious as a conective avenue. The raising of the units in order to spare the fauna improved the sustainability of the design.

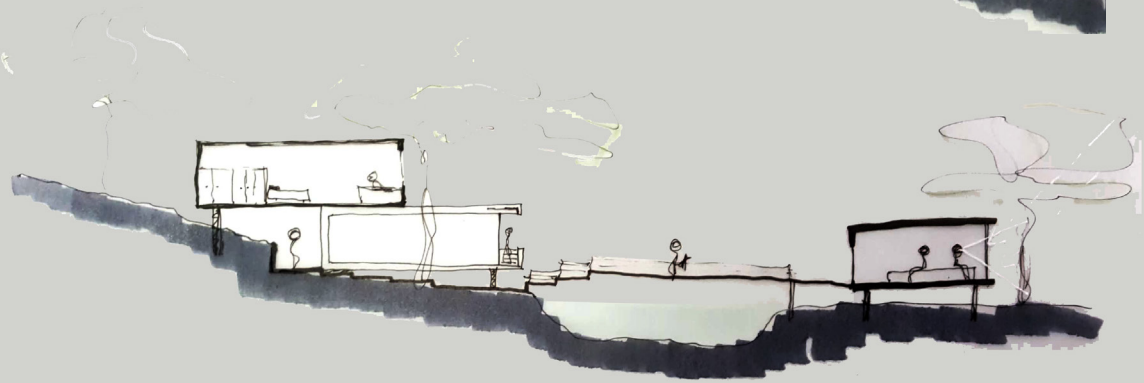
PHASE 3

The third phase attempted to condense the program. Drawing closer to the waters edge and condensing the program brought a new form to the design. Here the separation of public and private spaces is driven by the river and an existing historical stone dam wall.

Figure 94 - *Ground floor plan*

Figure 95 - *First floor plan*





The third phase developed to become the final massing phase.

Figure 96 - *Public vs. Private design layout, Ground and First floor diagram.*

Figure 97 - *Ground floor circulation*

Figure 98 - *Ground floor collage.*

Figure 99 - *Splitting living area from bedrooms.*

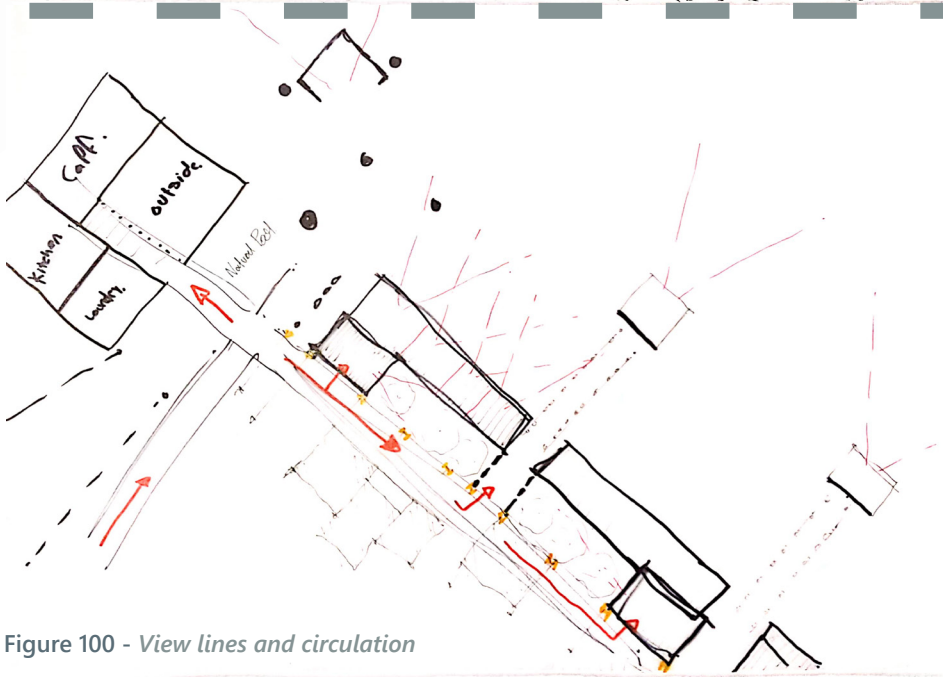


Figure 100 - *View lines and circulation*

PHASE 4

The fourth phase became the final massing exploration. The existing lines on the site were duplicated and repeated to form a grid to which the design could align. These grid lines were developed from the existing stone dam wall on the proposed site, the dam wall of the larger dam, the river line and the historical Anglo Boer wall.

The river bend guided the design, folding the forms to follow its natural progression.

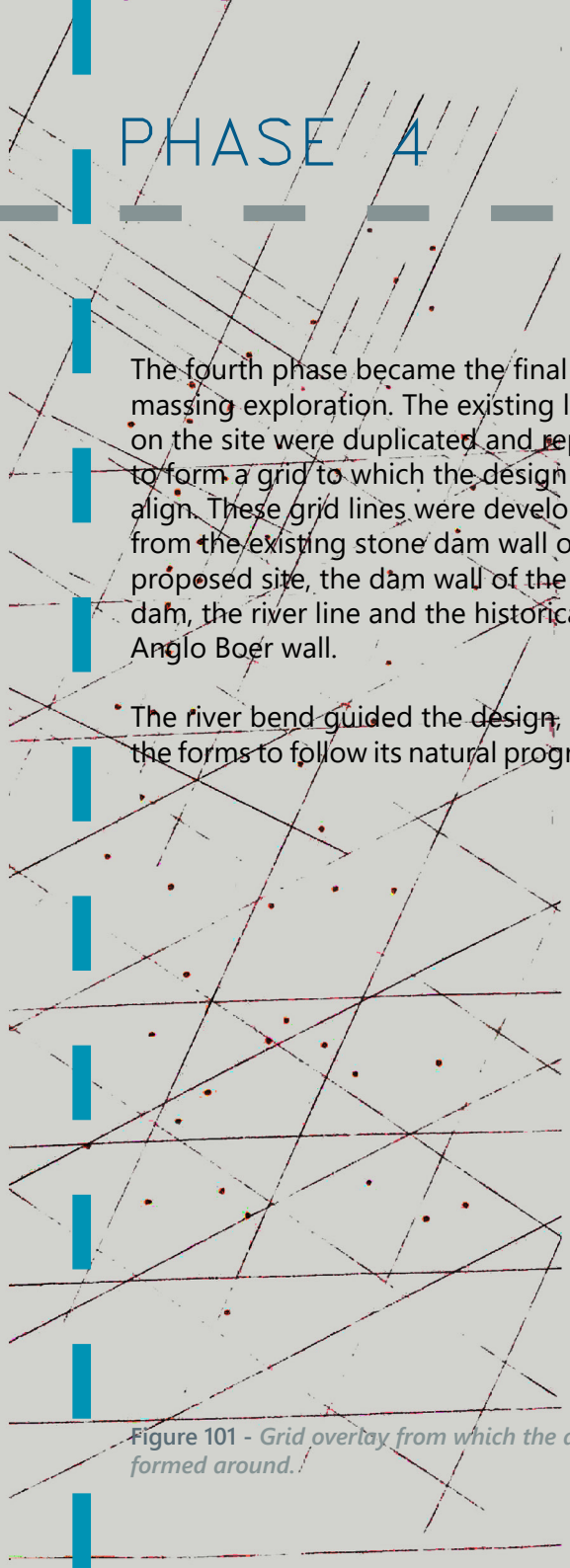
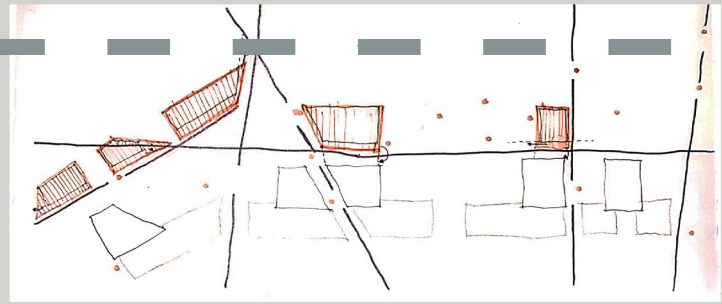
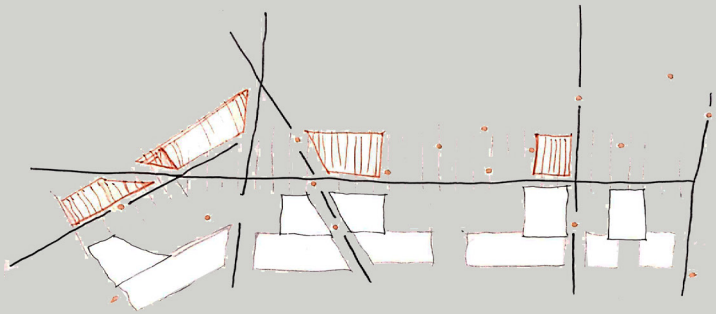


Figure 101 - *Grid overlay from which the design formed around.*

Figure 102 - *Conceptual sketch plan.*





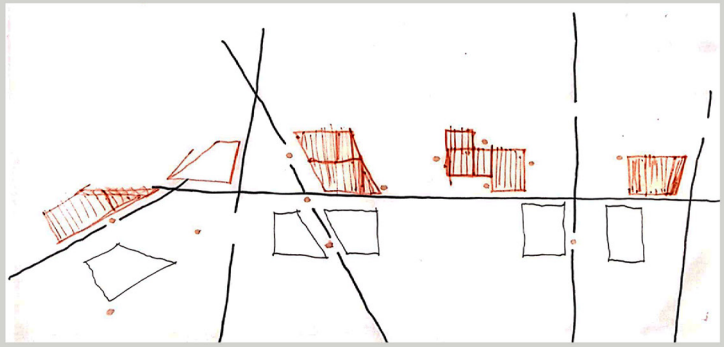
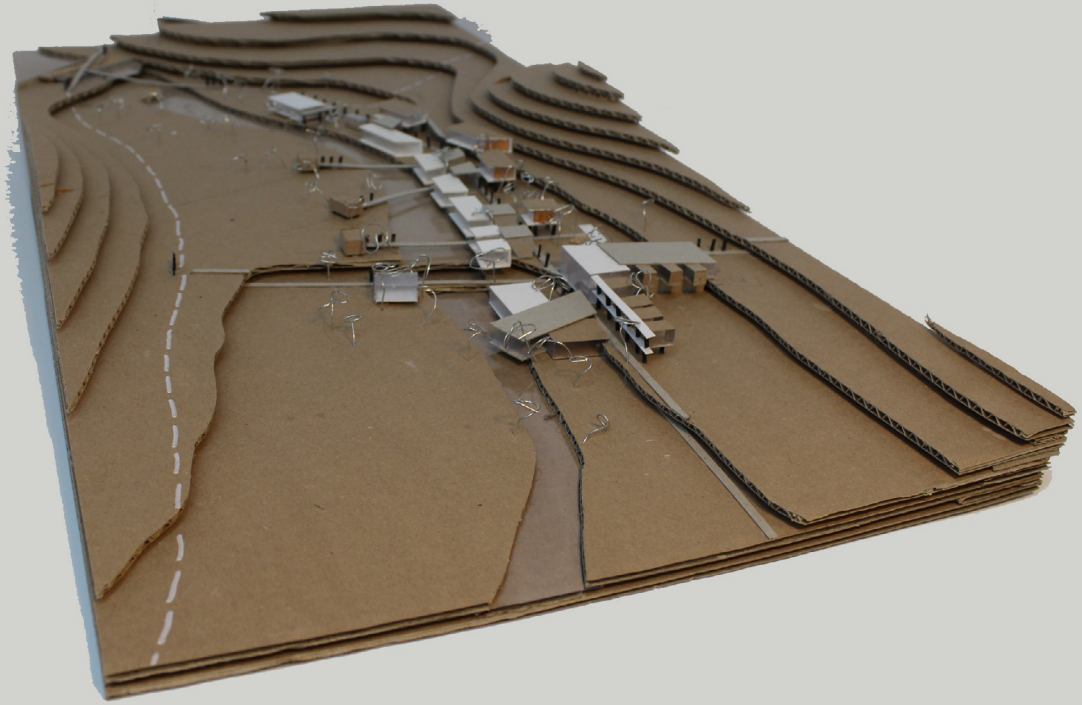
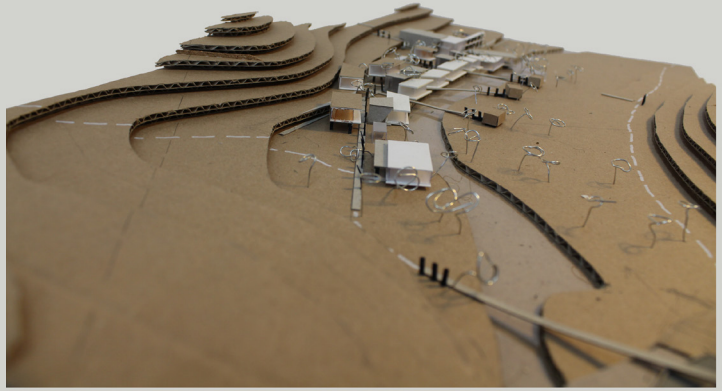


Figure 103 - *Conceptual sketch plan explorations.*





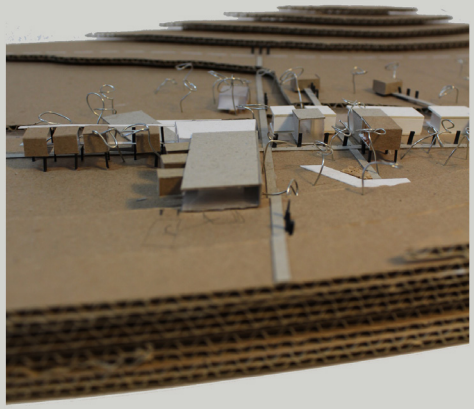
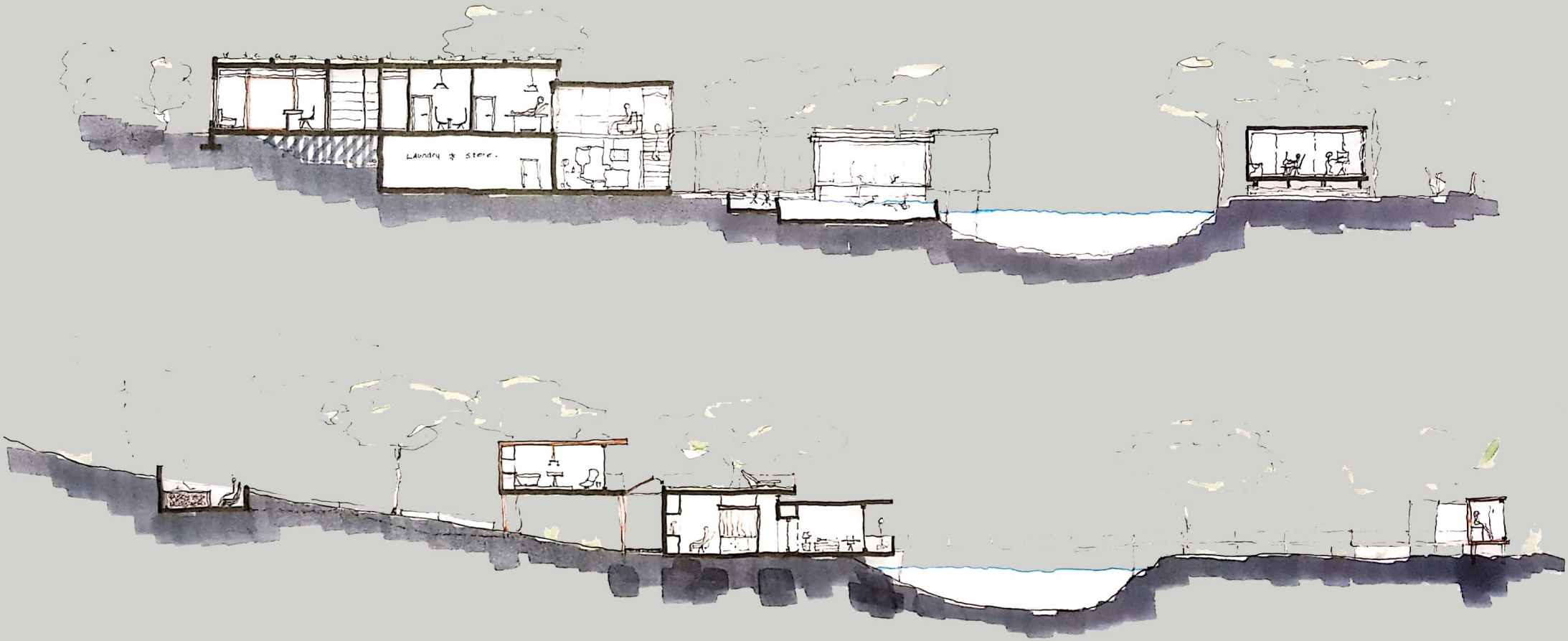
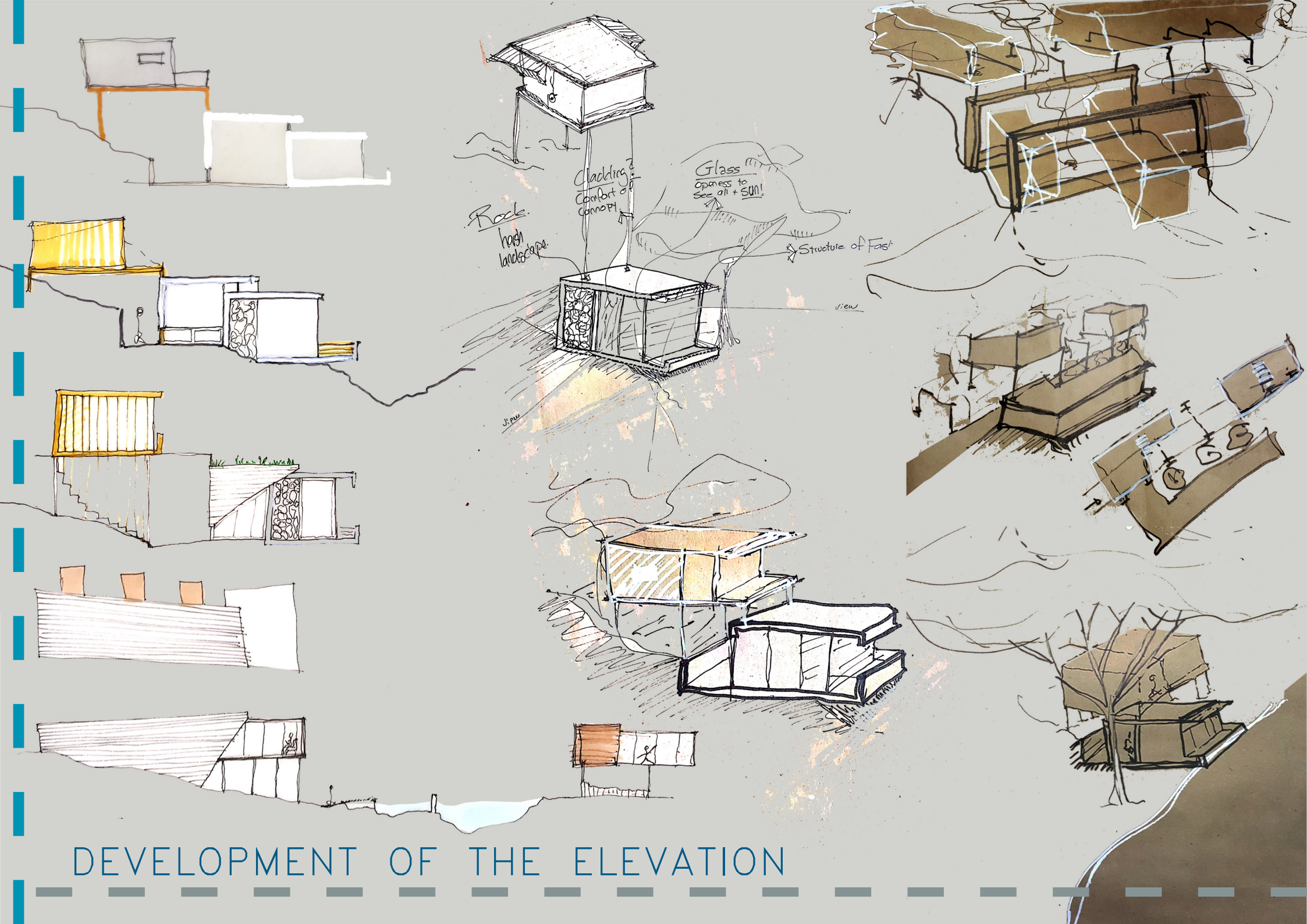
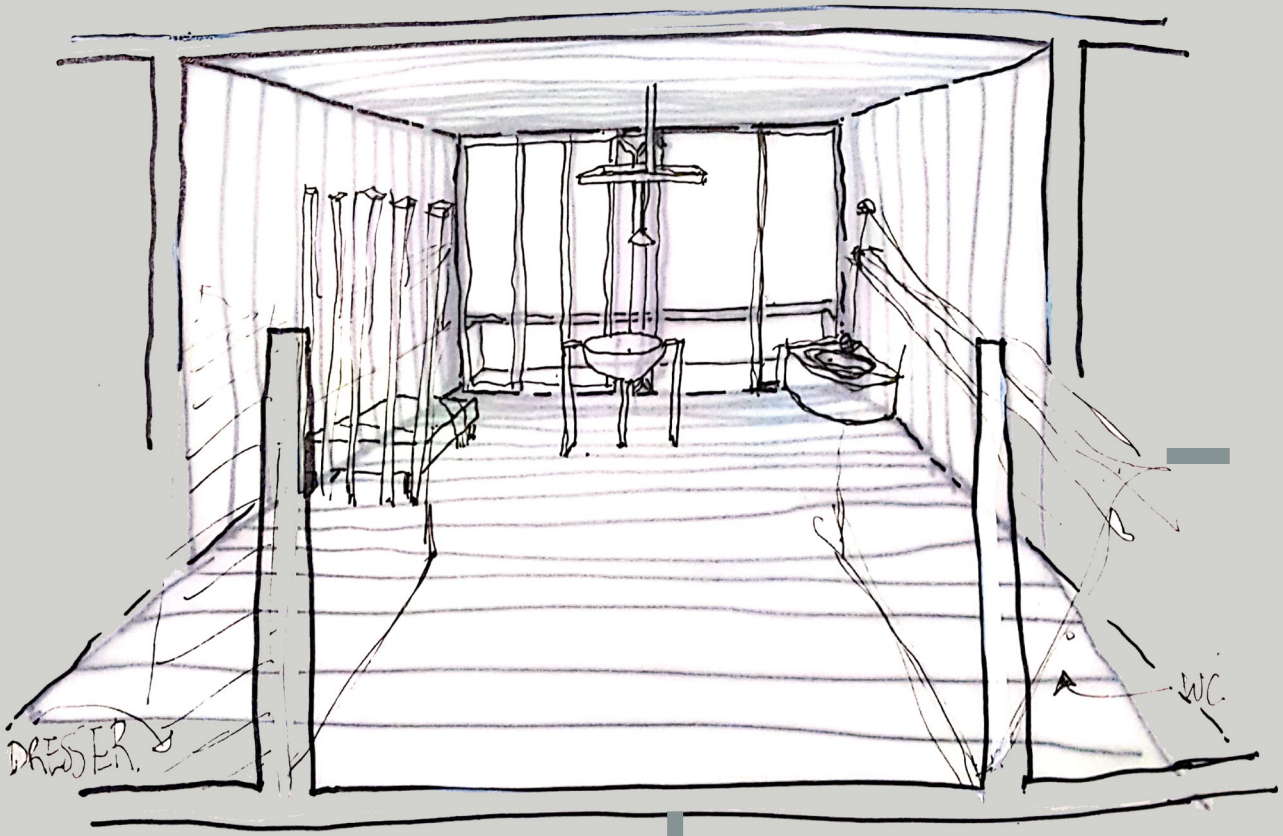


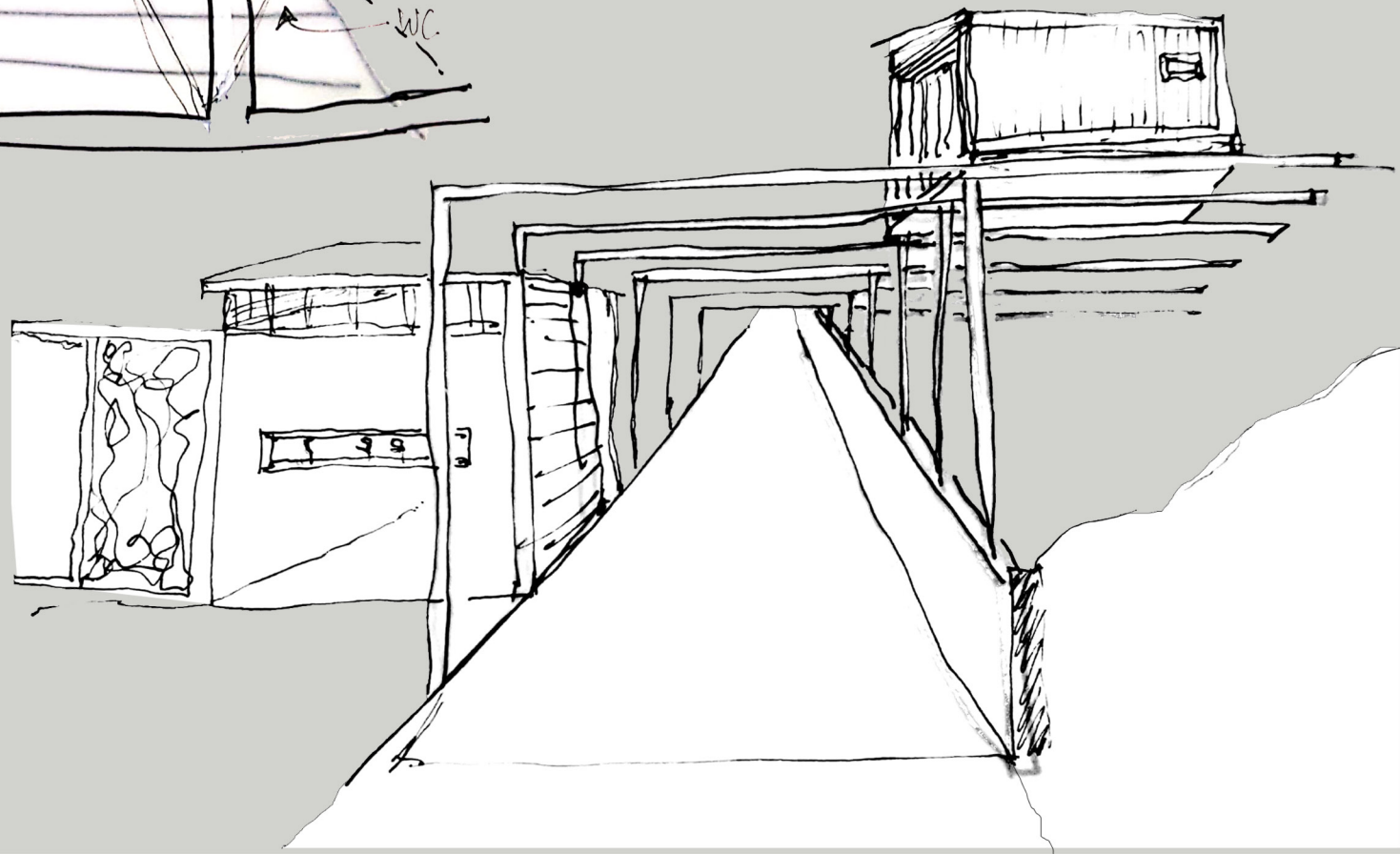
Figure 104 - *Images of Conceptual 1:500 model.*


Laundry & store.



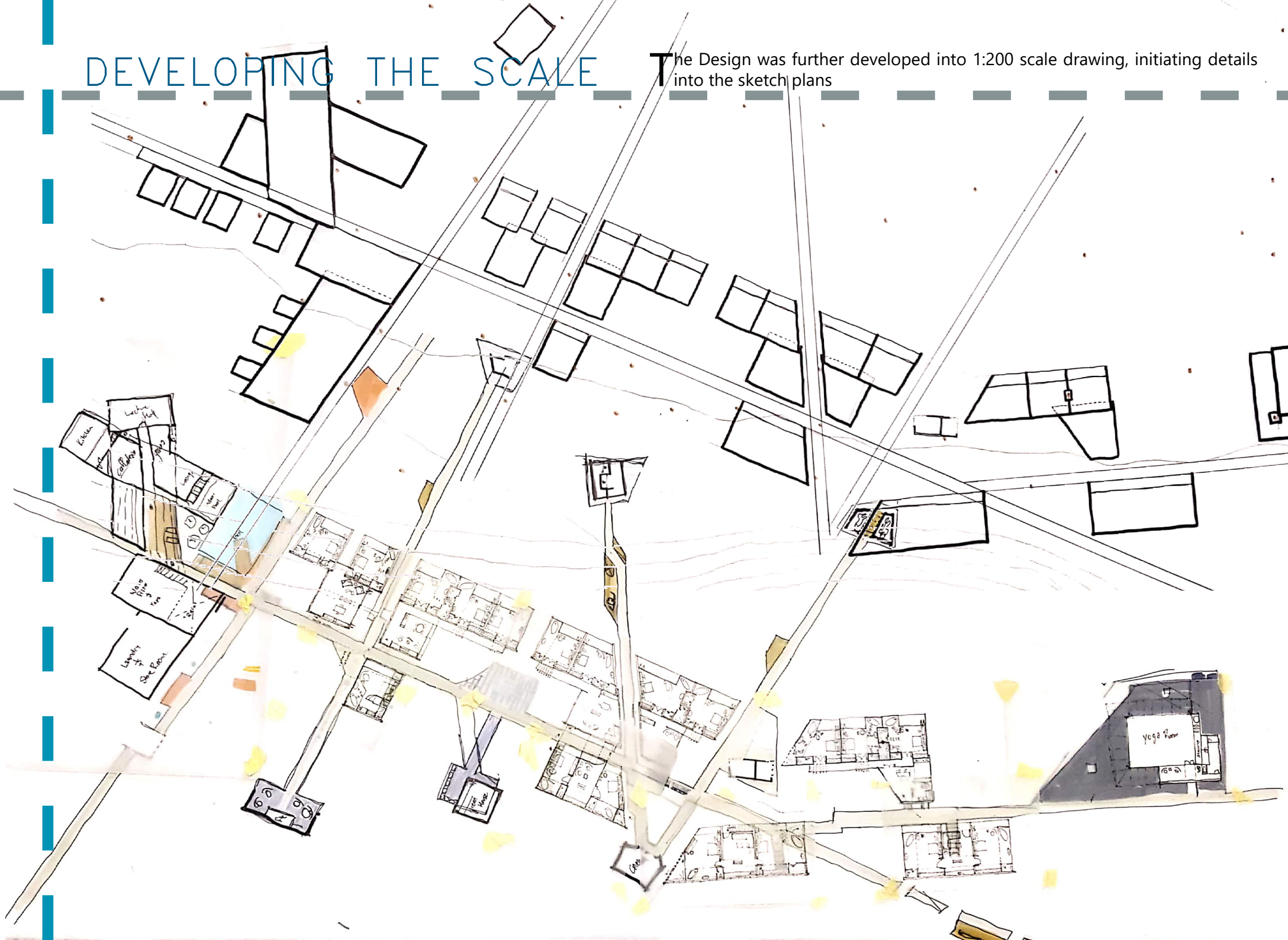
DEVELOPMENT OF THE ELEVATION


DRESSER
WC.

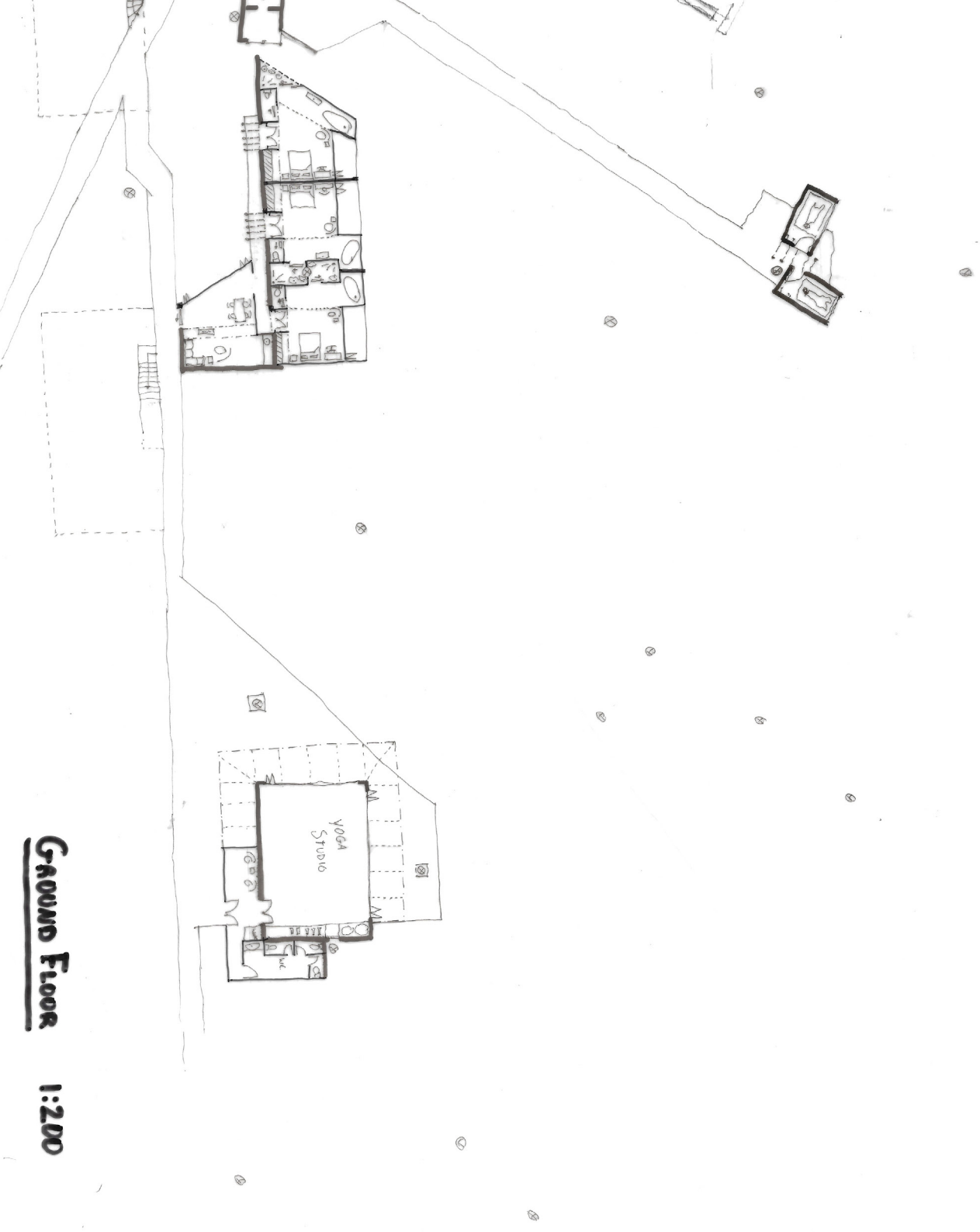


DEVELOPING THE SCALE

The Design was further developed into 1:200 scale drawing, initiating details into the sketch plans




ART
LECTURE HALL
KITCHEN
CAFETERIA & DEMONSTRATION
GAMES
LOUNGE
INDOOR POOL
WATER FILTER & BOILER
BATHS
LAUNDRY & STORE ROOM
FIRE
GREEN HOUSE
LIBRARY



GROUND FLOOR 1:200

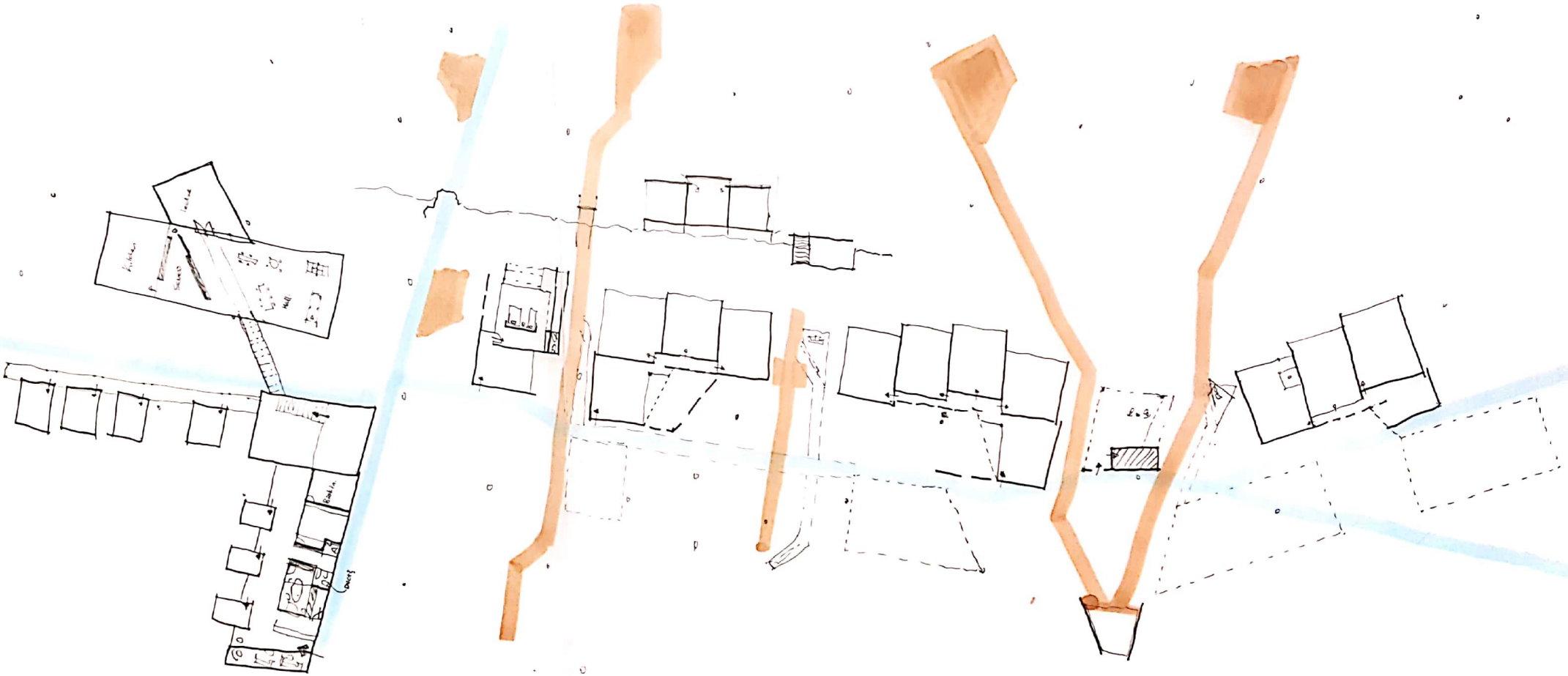
DEVELOPING A FLOOR PLAN

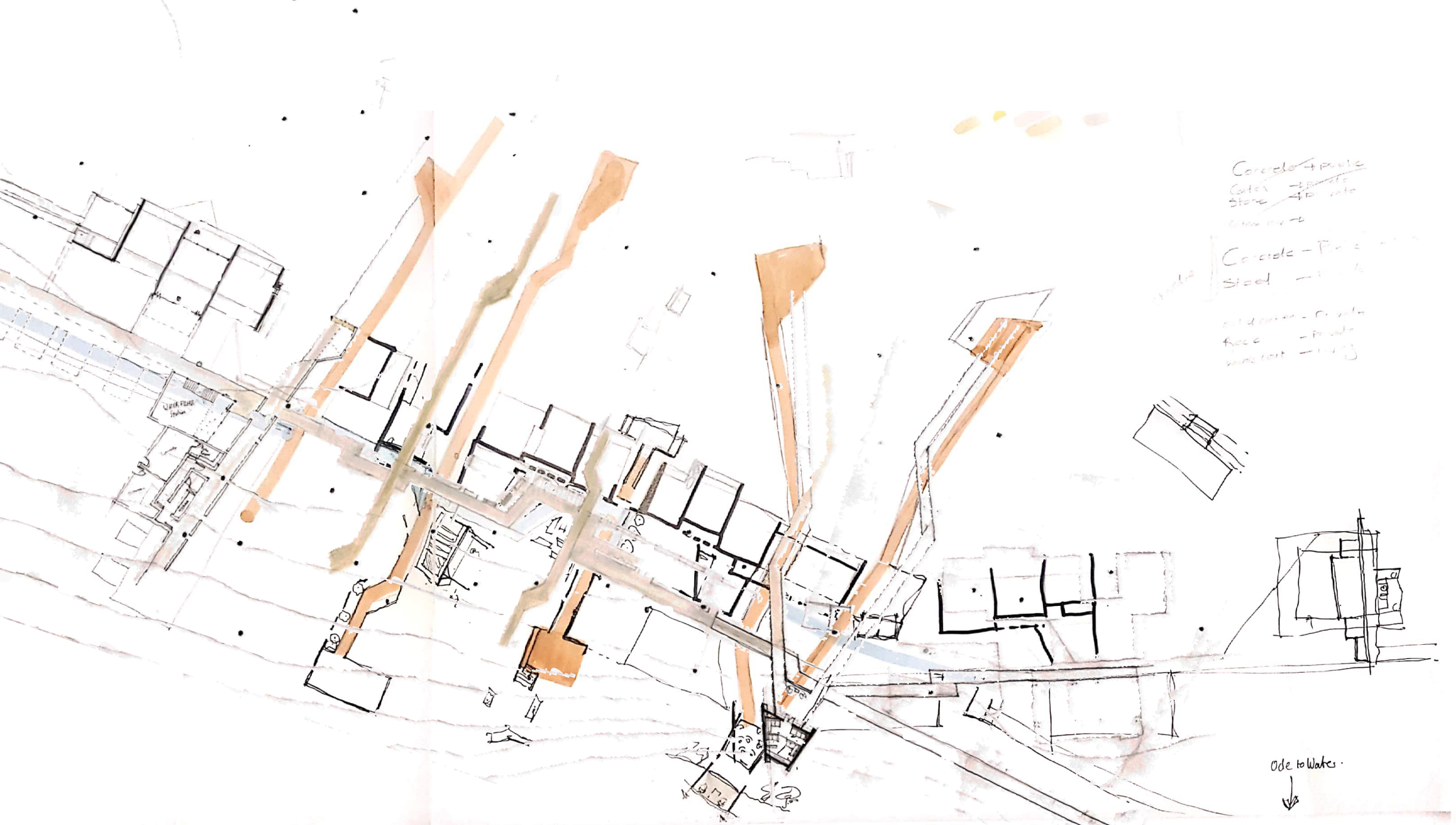
LIFE COACH
HOMEO.
Dr.
Dr.
WAITING ROOM
NURSE
BLOOD LAB
EXAM ROOM
STORE
RECEPTION
Possible Pool
+ Doctor Waiting Room
+ Board Room

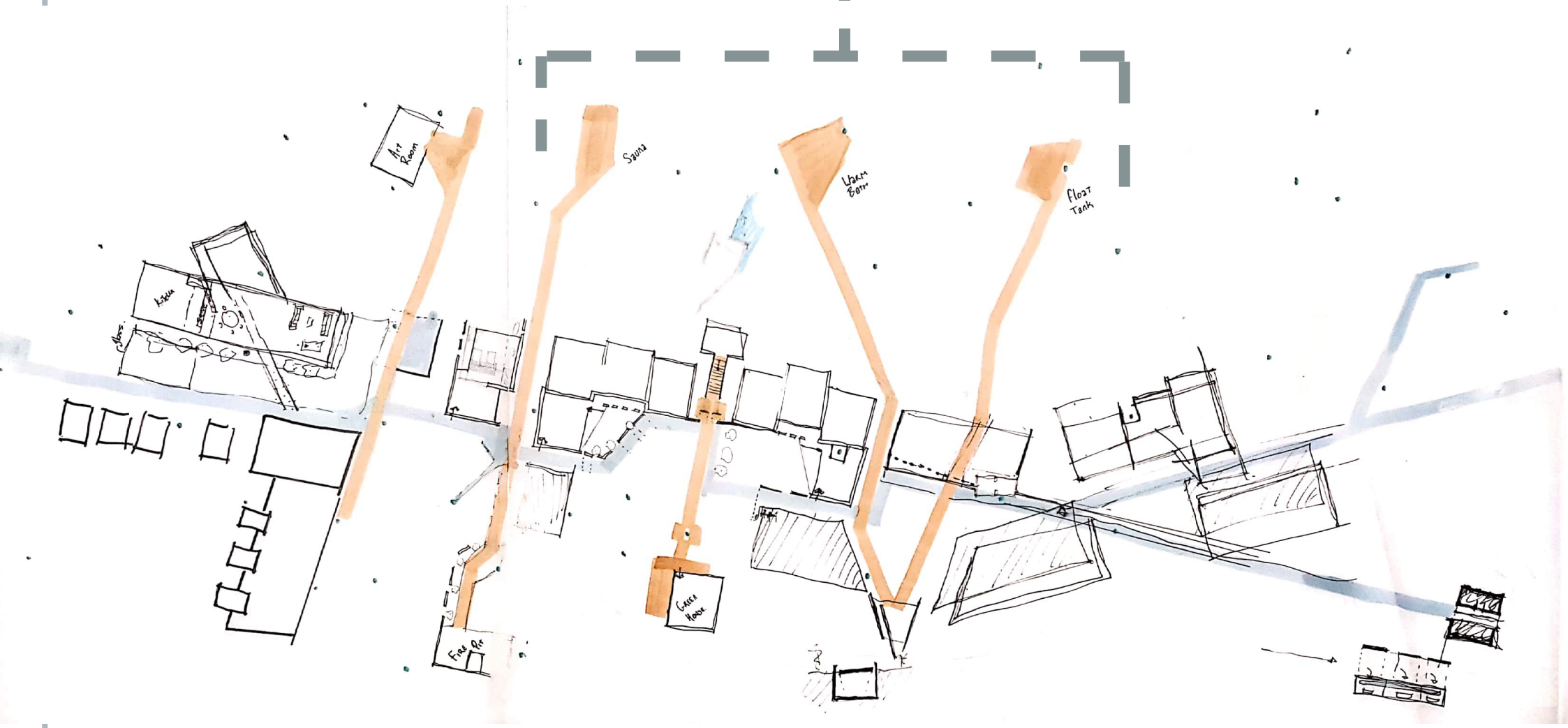
The 1:200 floor plans were generated from the conceptual sketch plan. Whilst the small scale highlighted the angular buildings as fluid, the sharp irregular corners and angles proved impractical for the living units.

The guiding pathway is too bland and elongated without a final focal point at the end.

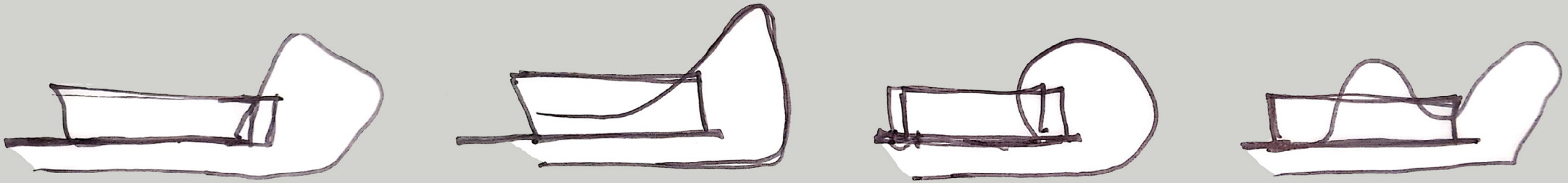
Focus on the living units and the experience of fasting needed to be explored in order to create a design which provides a space of knowledge and comfort within the liminal.

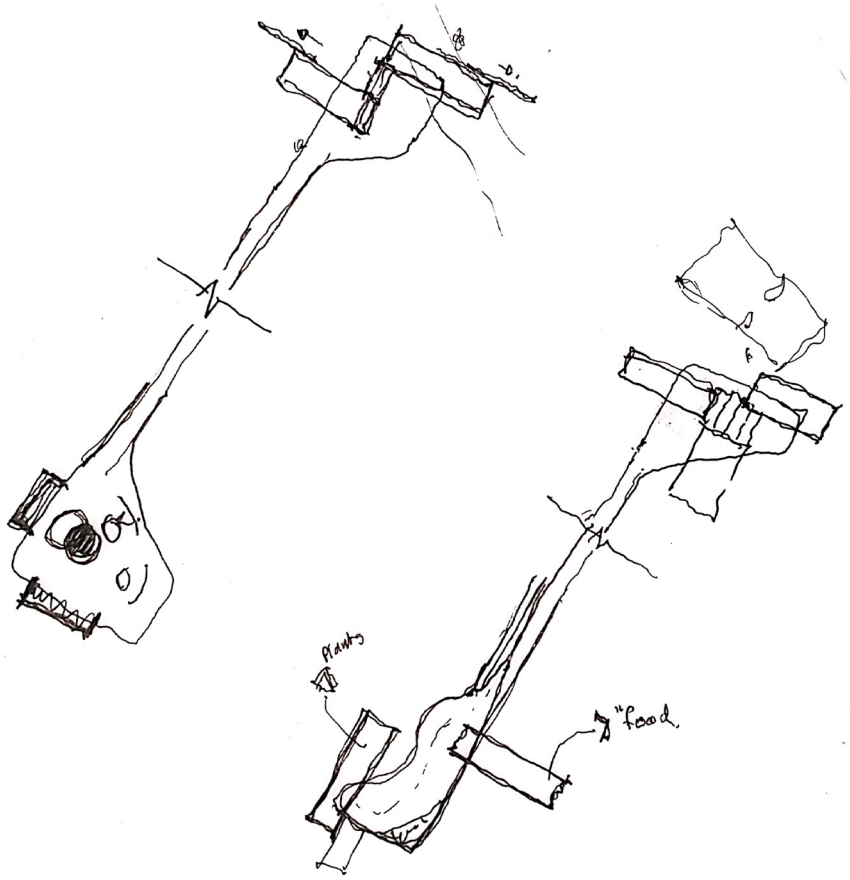



Ode to Water.


Art Room
Sauna
Kitchen
Float Tank
Green House
Fire Pit

DEVELOPING ISOLATED REFLECTION



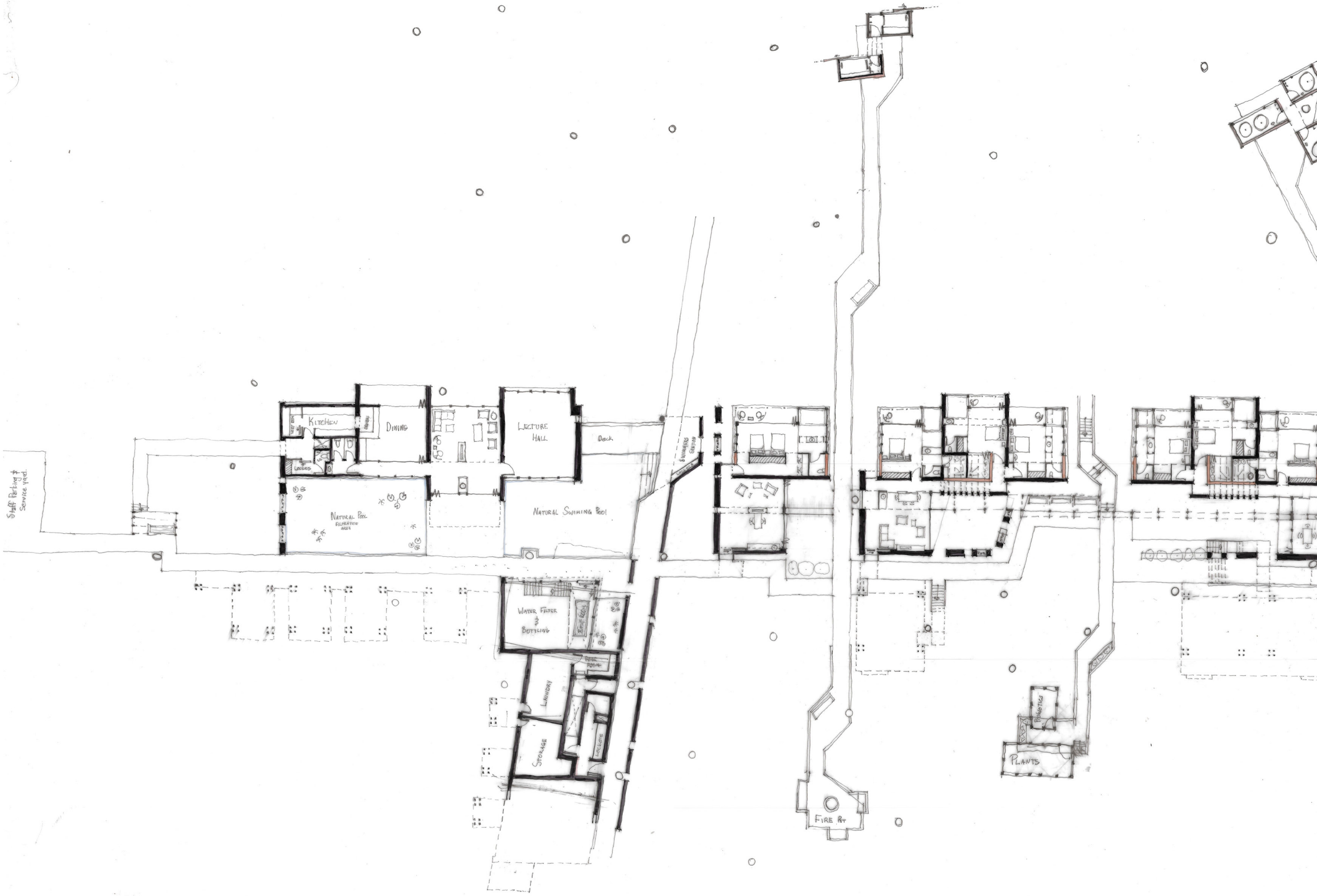


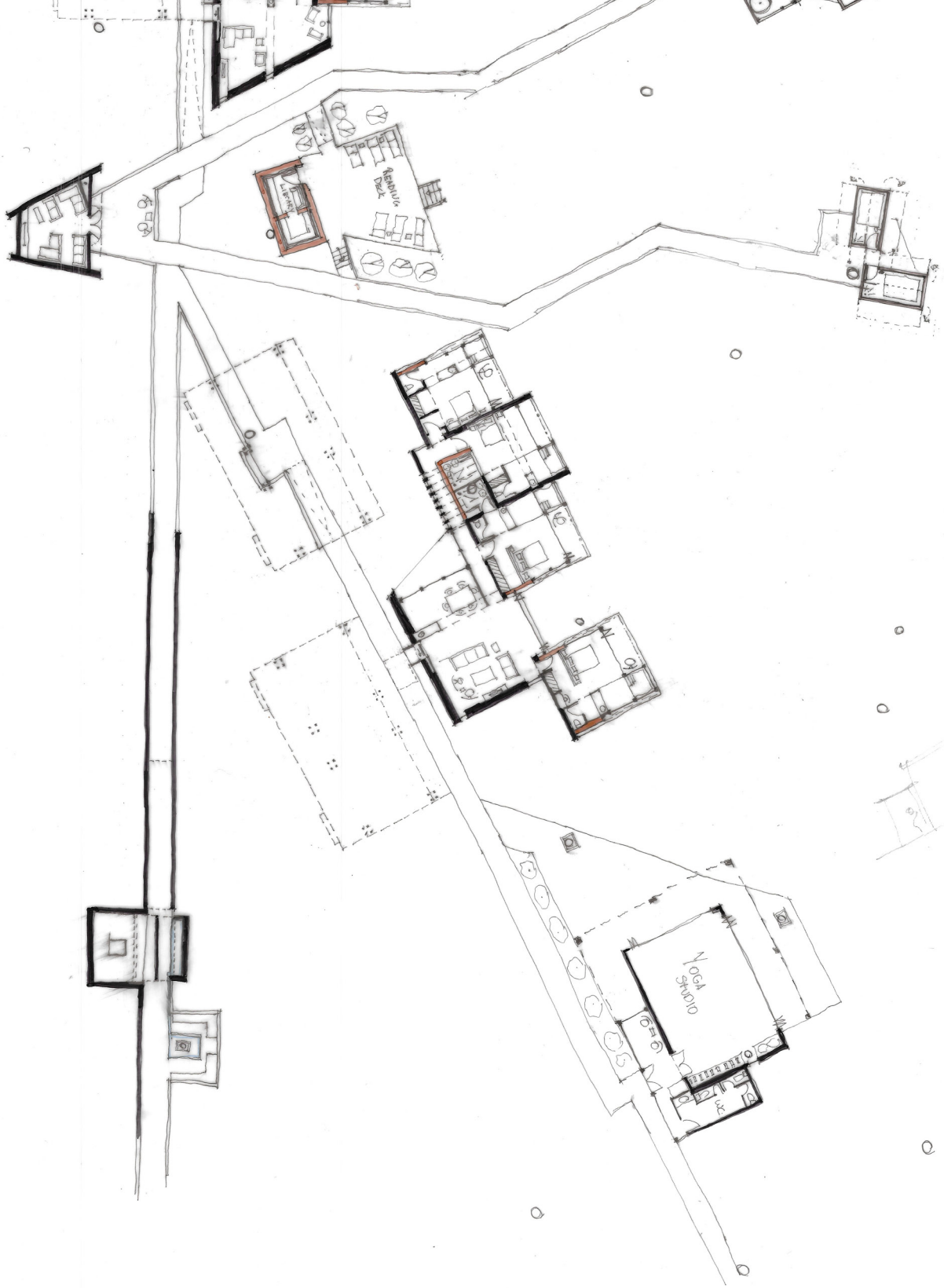
Sauna: → TYPICAL ∴ Horizontal View → Vertical movement for Horizontal View / Move to Horizontal for Max View.

Baths: → Typical ∴ Mixed Views → Move the Roof for Wider Perspective

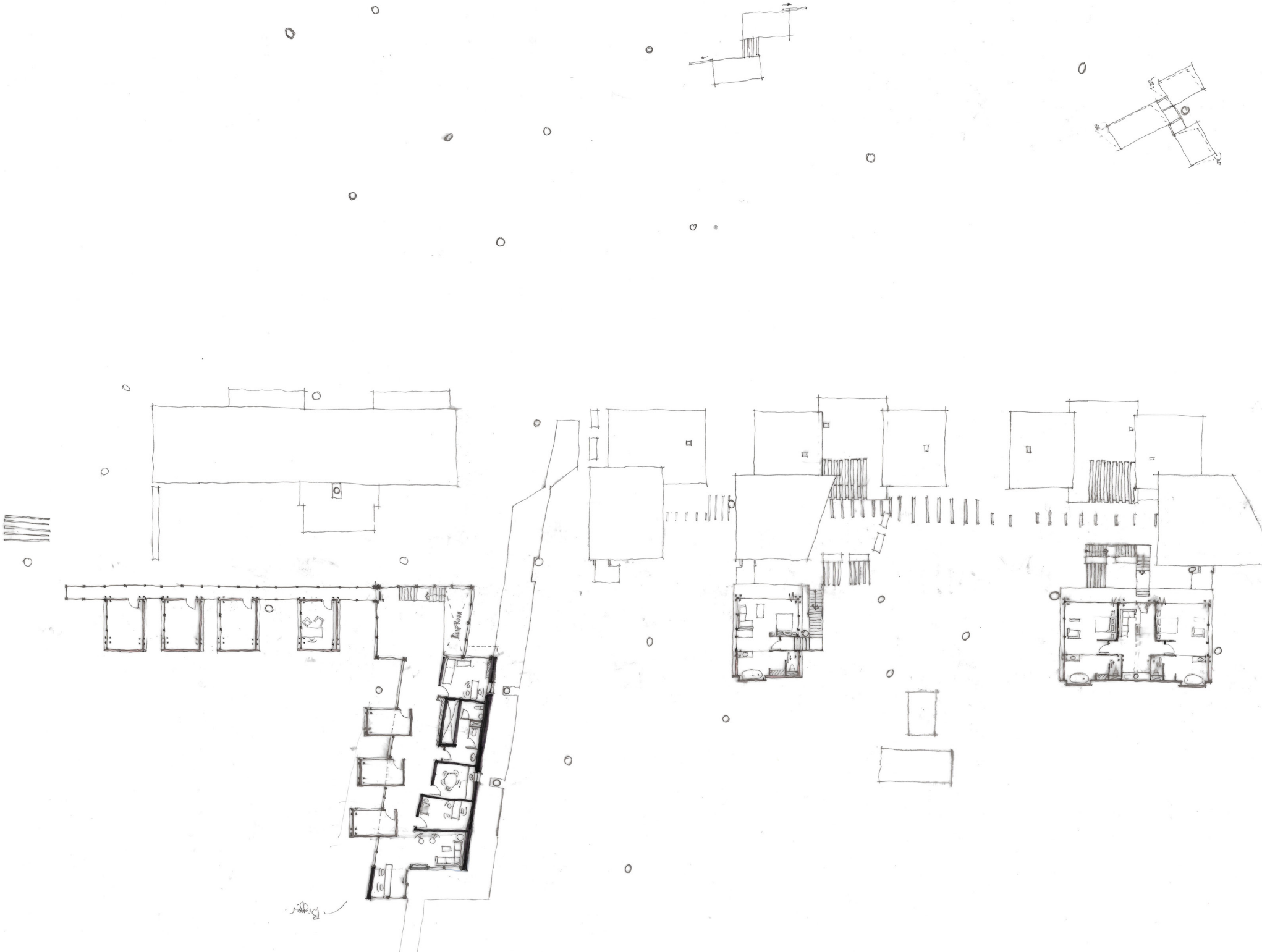
Float Tank: → Typical ∴ Vertical View → open Roof for complete Vertical View

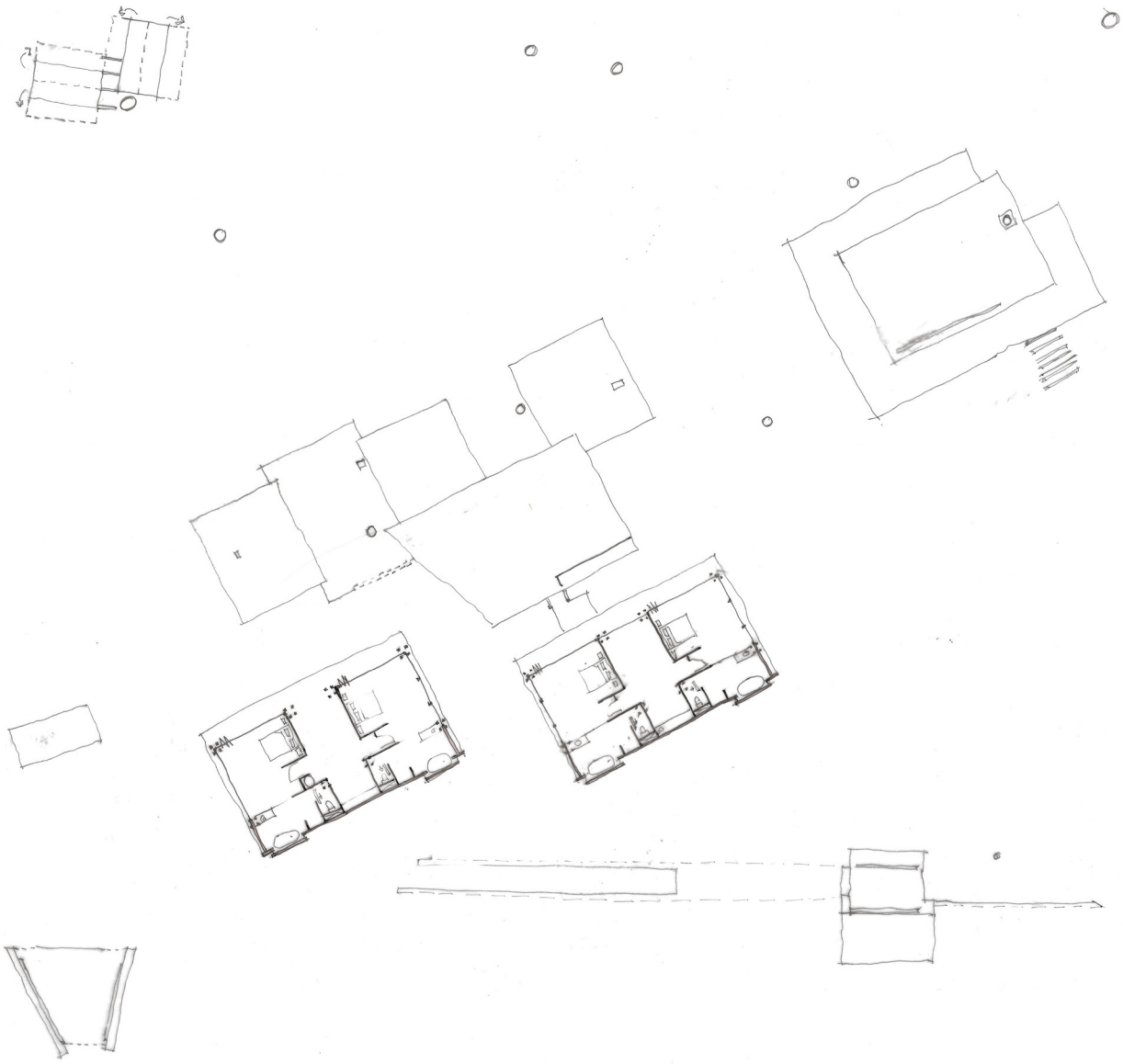
Isolated Reflection → individual works the mechanism to allow "Connection" to NATURE while REFLECTING. (Ritual.)


Staff Parking & Service yard
KITCHEN
DINING
LECTURE HALL
Deck
SWIMMING STEPS
LOCKERS
NATURAL POOL
FILTRATION AREA
NATURAL SWIMMING POOL
WATER FILTER & BOTTLING
STAFF ROOM
LAUNDRY
STORAGE
LOCKERS
PLANTS
FIRE PIT



DEVELOPING THE FLOOR PLAN



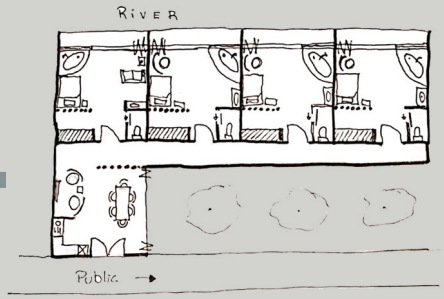


TOWARDS A HOME

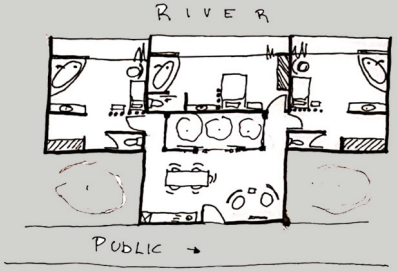
Enduring a fast is a wonderful experience, but is taxing at times, comfort for the client throughout the fast becomes vitally important. Because clients should be encouraged to engage with each other, sharing and learning from each other, the living units share a communal living space, through which the clients have access to their bedrooms. The units have a varied number of guests, from single/couple units, where partners or friends can live together through the duration of the fast and re-feeding, to units of 4 bedrooms. Clients will be placed in units according to the duration of their fast. Therefore each unit will have clients who are going through the same stages of fasting, creating a space in which personal one-on-one reflection can occur between peers.

The bedrooms have clear views of the river and nature, with large glass façades which invite nature into the building. Orientation towards North-East allows for maximum natural light.

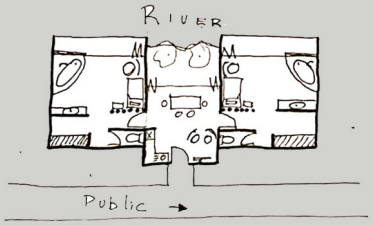
Whilst fasting, showering is discouraged as it tends to lower blood presser and cause fainting, therefore bathing replaces showering. The bath becomes a space for isolated reflection, of both the self and nature. Basins become the guiding principle within each room, showing the importance of the water throughout the bedroom.



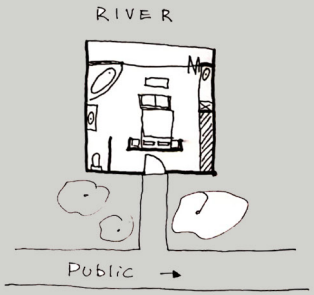
4 Bedroom Layout



3 BEDroom Layout



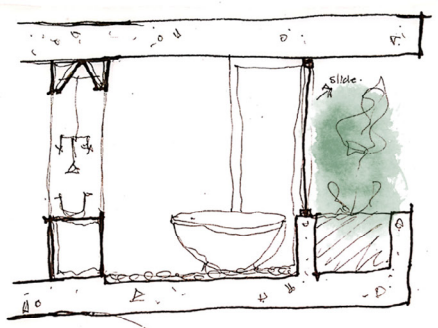
2 Bedroom Layout

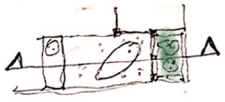


Single/Couple layout

Figure 105 - *Preliminary residential layout.*

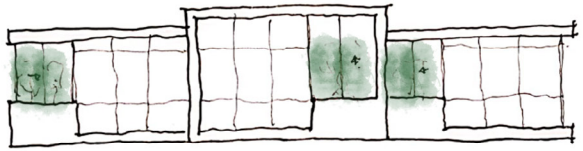
proposal 1

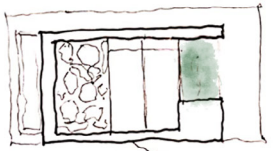


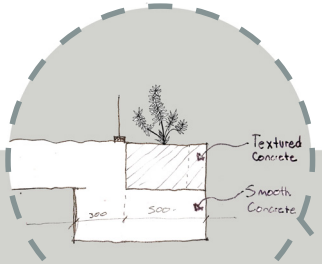


Pos:
- Privacy
- No downstand
- @ railing

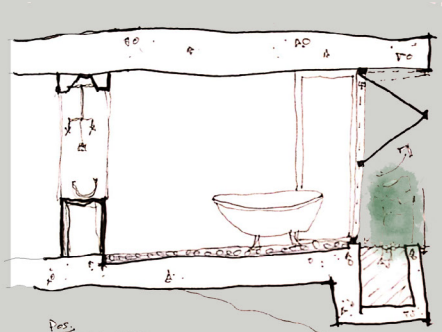
Neg:
- Not as cool.





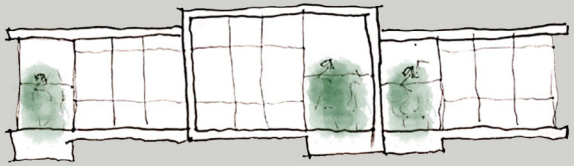


proposal 2



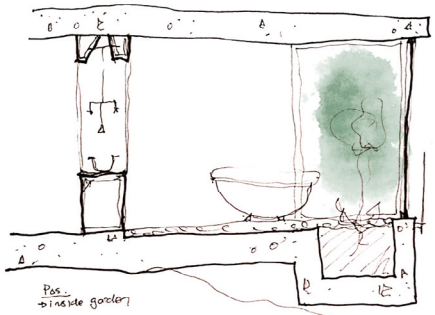
Pos:
- completely open
- Part ventilated.

Neg:
- downstand
- Railing not @ level.



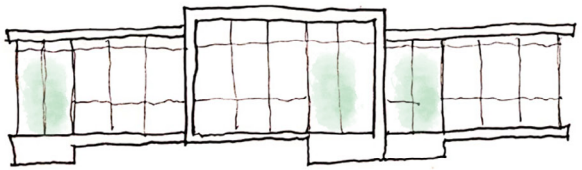
Selected proposal

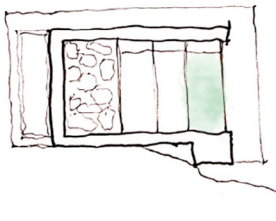
proposal 3



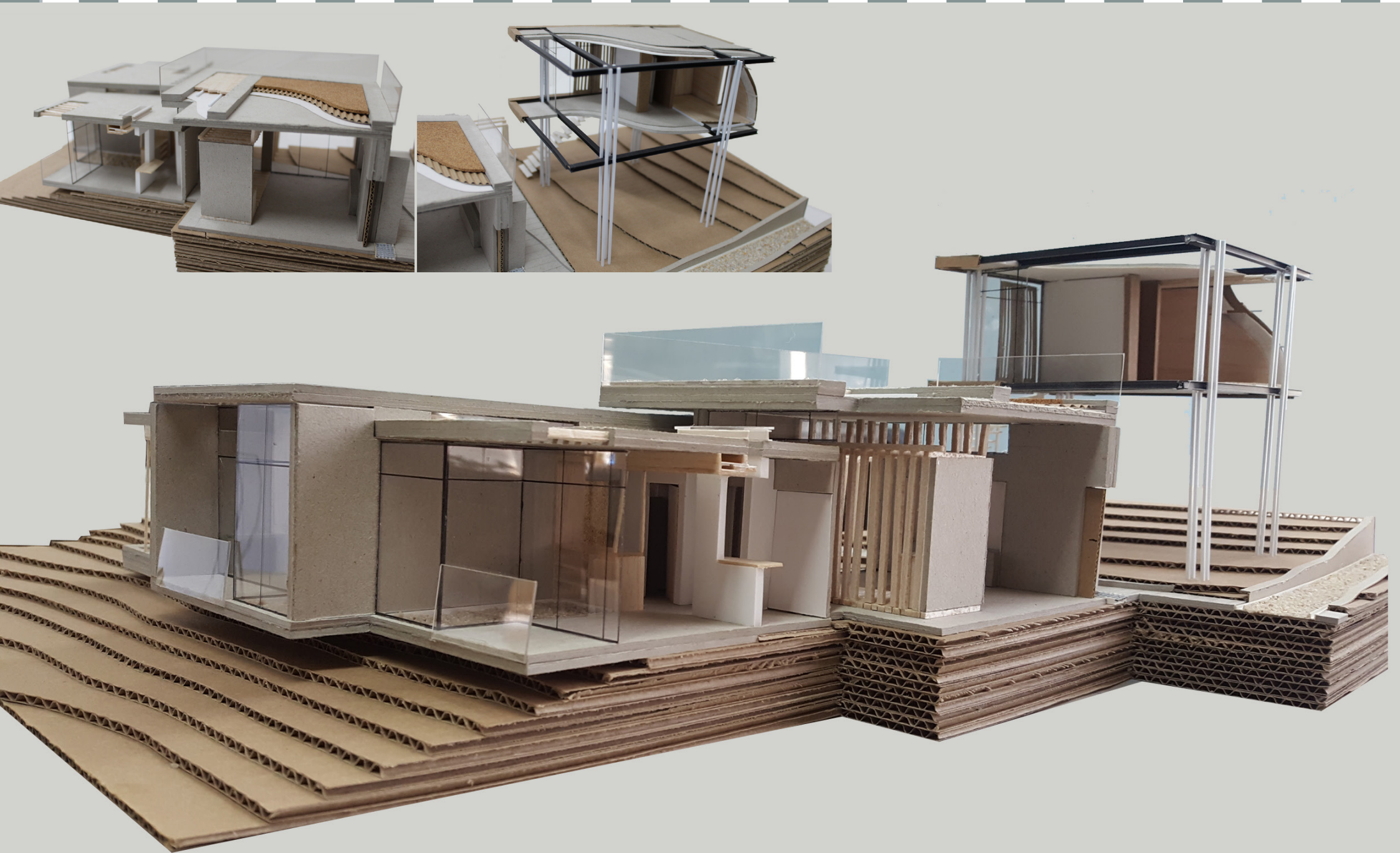
Pos:
- inside garden

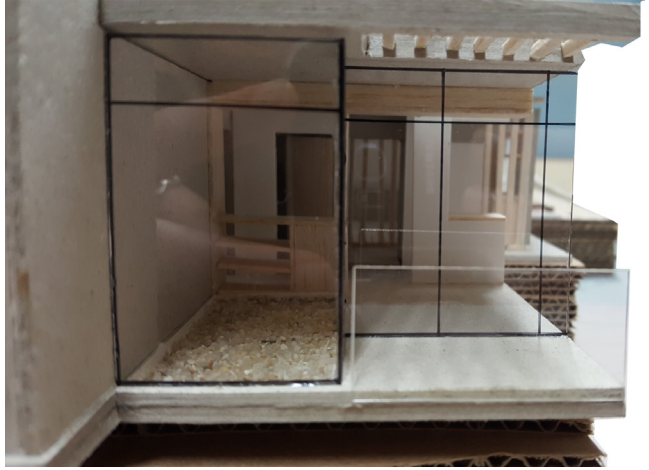
Neg:
- downstand
- inside garden, cleaning, maintaining
- Window?

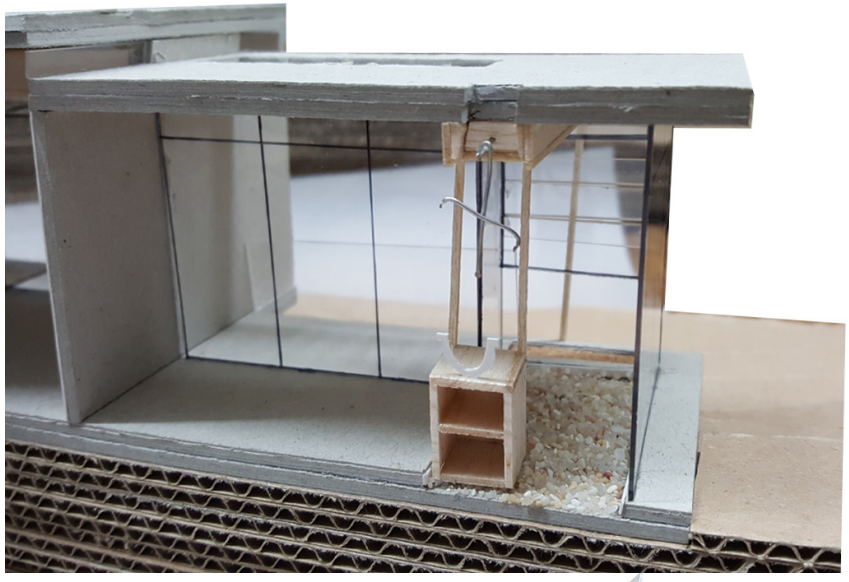




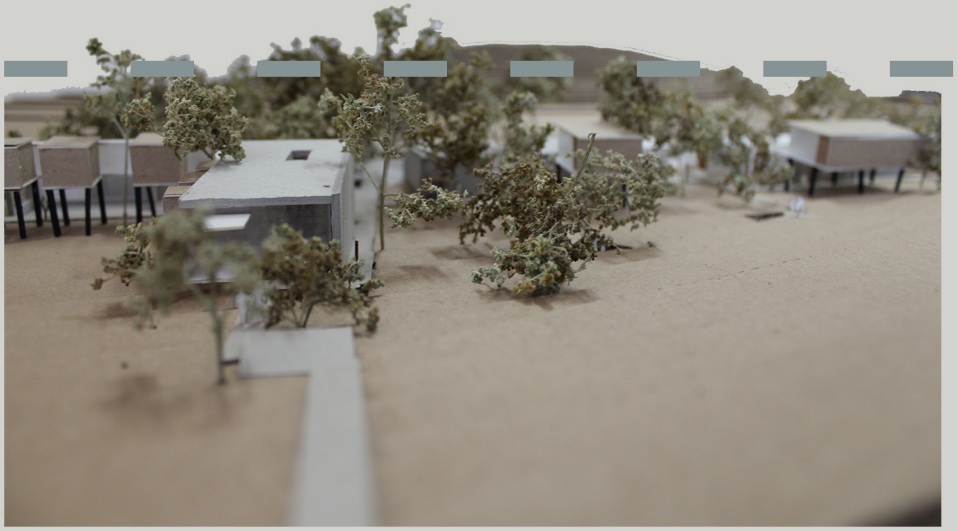
1:50 Structural model of typical living units

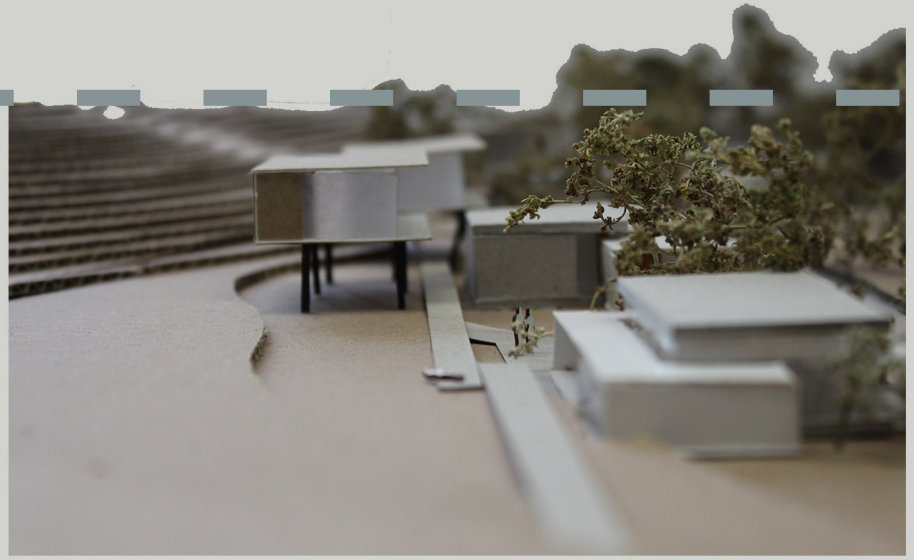


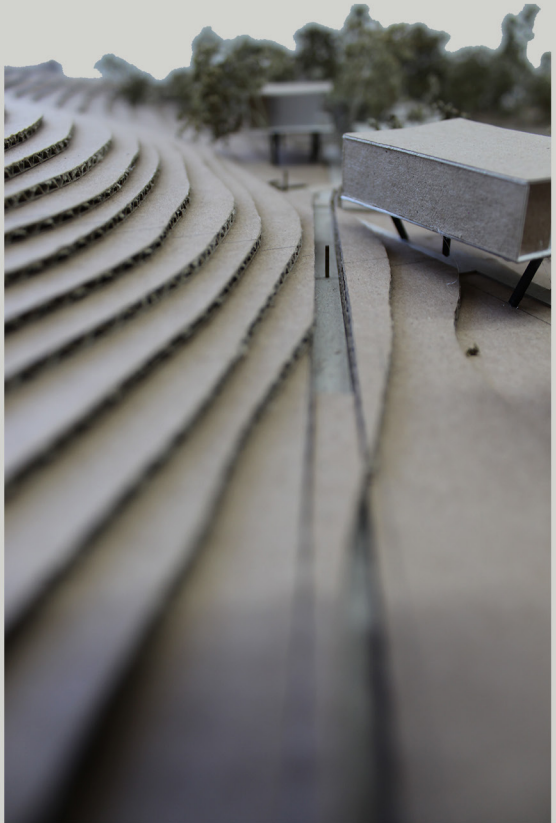


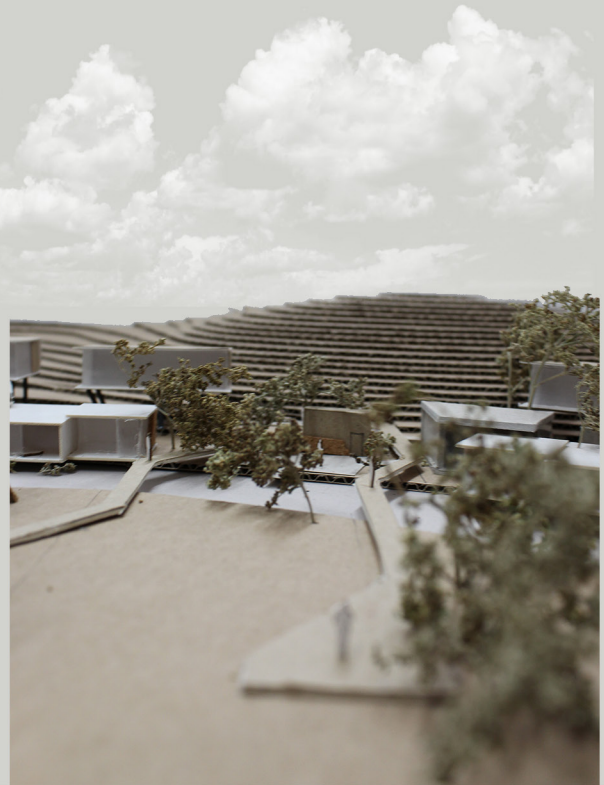


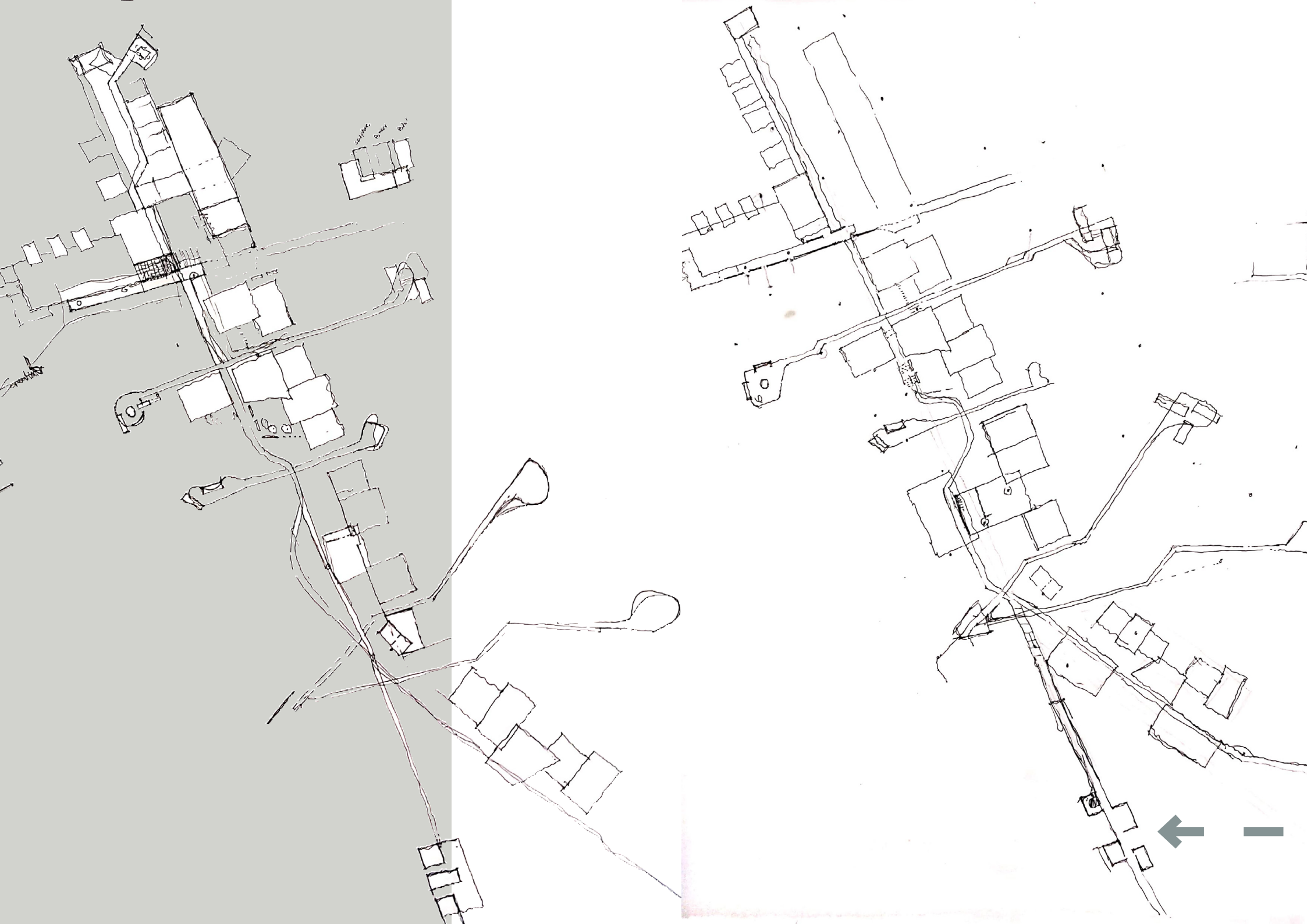
1:200 Model Exploration











DEVELOPING A CHAPEL

Water Fasting in itself is a spiritual journey during which self discovery and inner healing can occur. Providing a space for the spiritual realization which is not a destination but a tool for deeper reflection of the self and nature provides value throughout the experience.

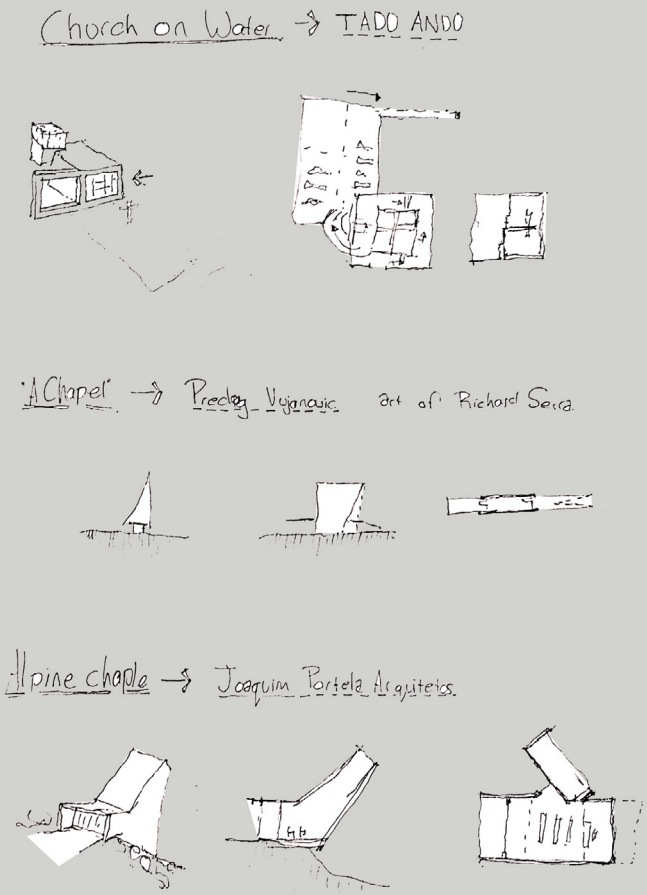
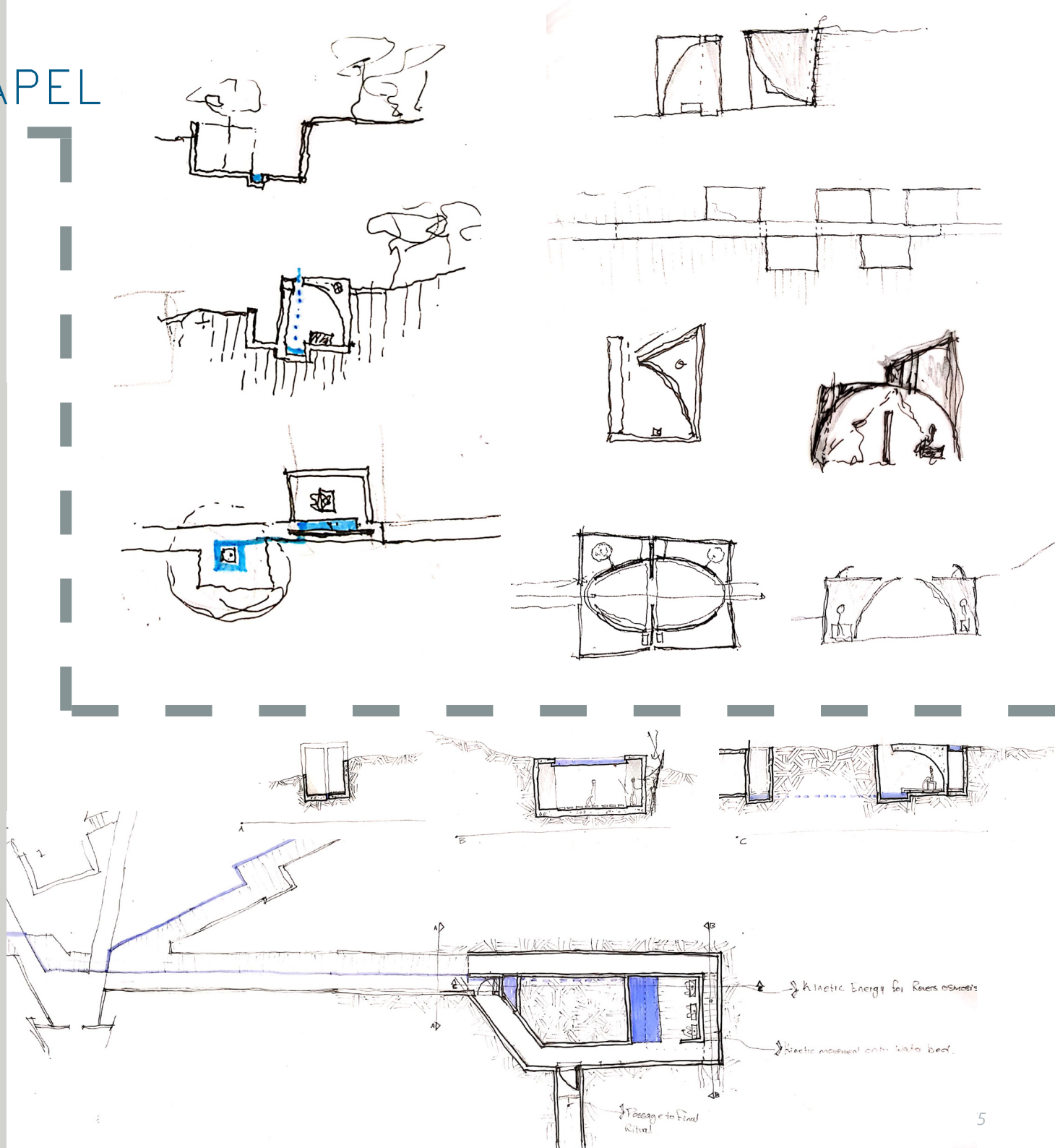
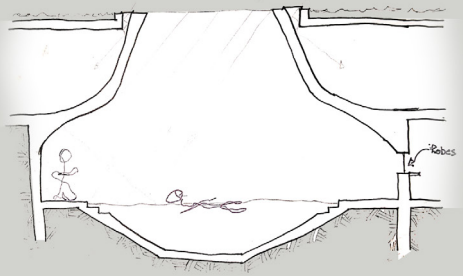


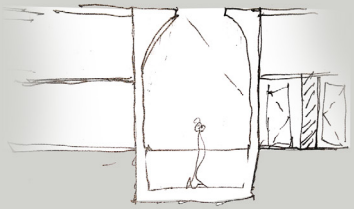
Figure 106 - *Basic precedent studies.*

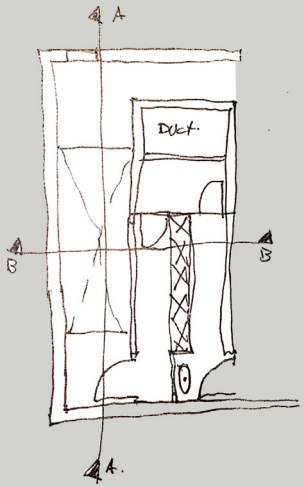


DEVELOPMENT OF THE CLEANSING RITUAL

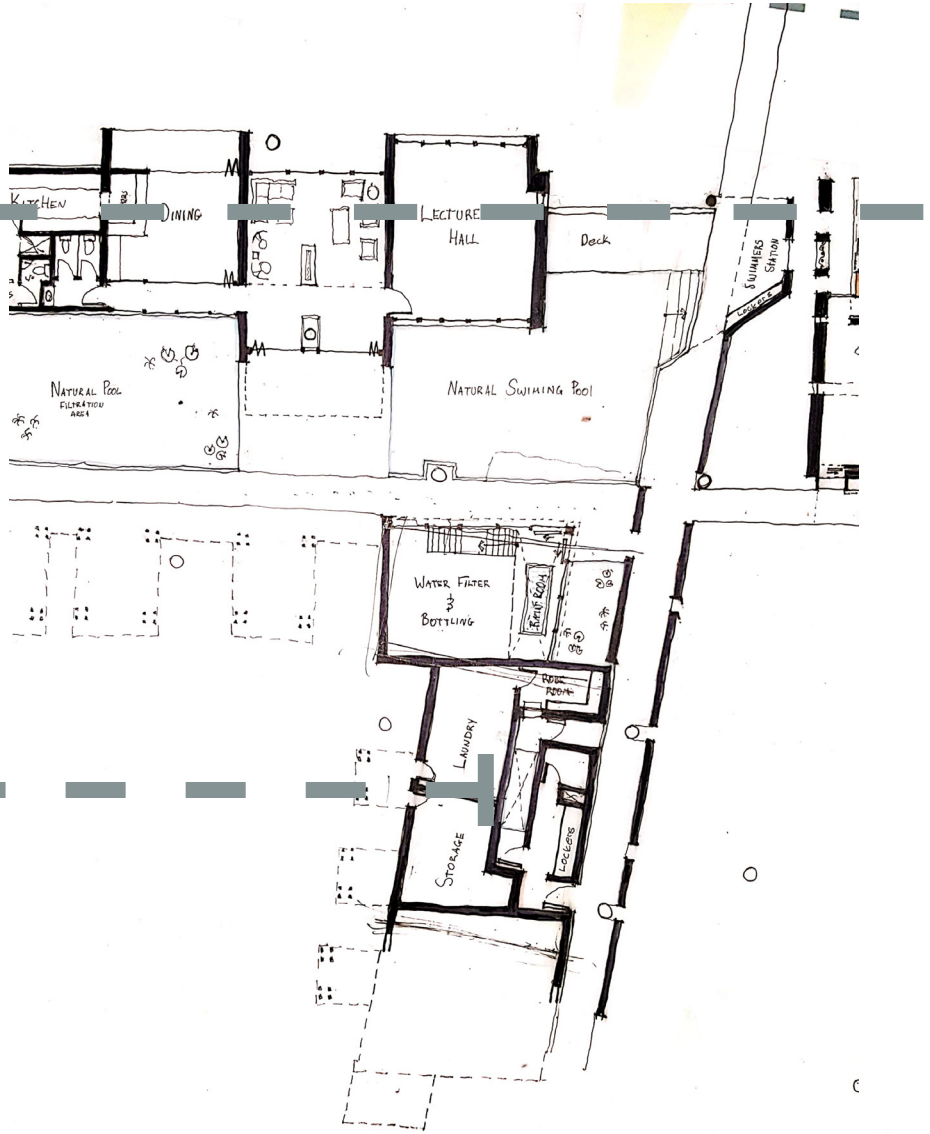
Liminality requires a separation or 'death' of the prior self upon entering the liminal phase. This cleansing of the past allows for a 'clean slate' on which the liminal journey can allow the new self to be formed.
The centre thus includes a cleansing ritual upon entering the centre in the form of a cleansing tank.

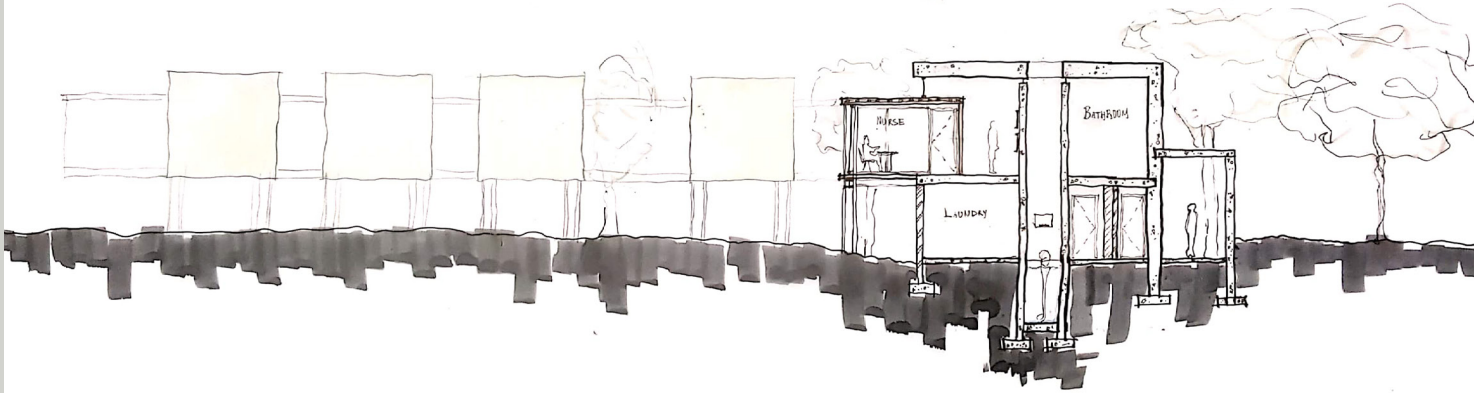






Clensing Tank





Robing Area.
Robes and towels to be provided.

Robe and towel area.

Robe store.

Seat within the water.

Clensing tank.
Heated water with open air skylights.

Filter and pump room.

Clothes collection point

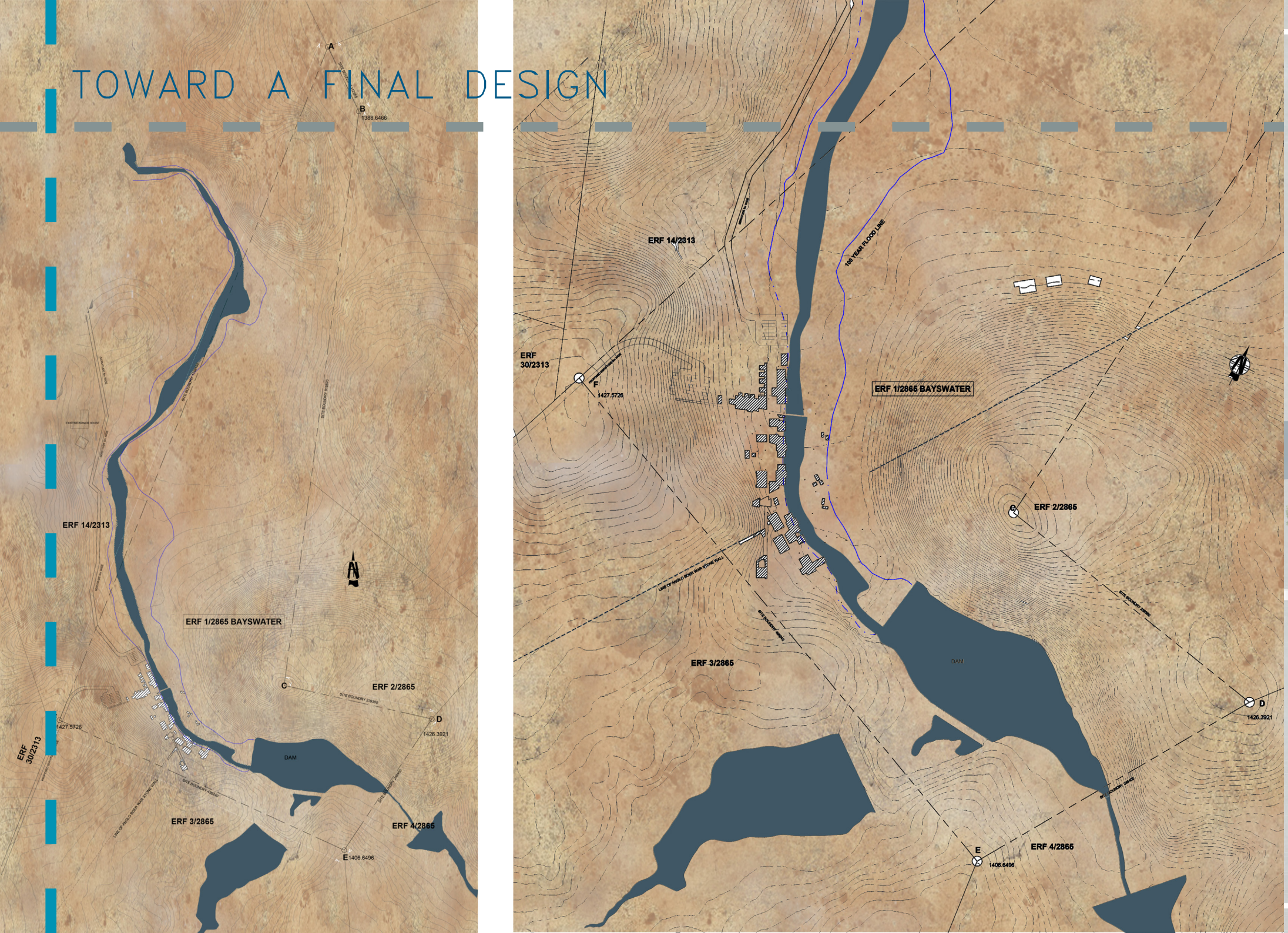
Seat

Clensing Ritural.
Undressing and leaving the past behind.

Machine room.

Elevator

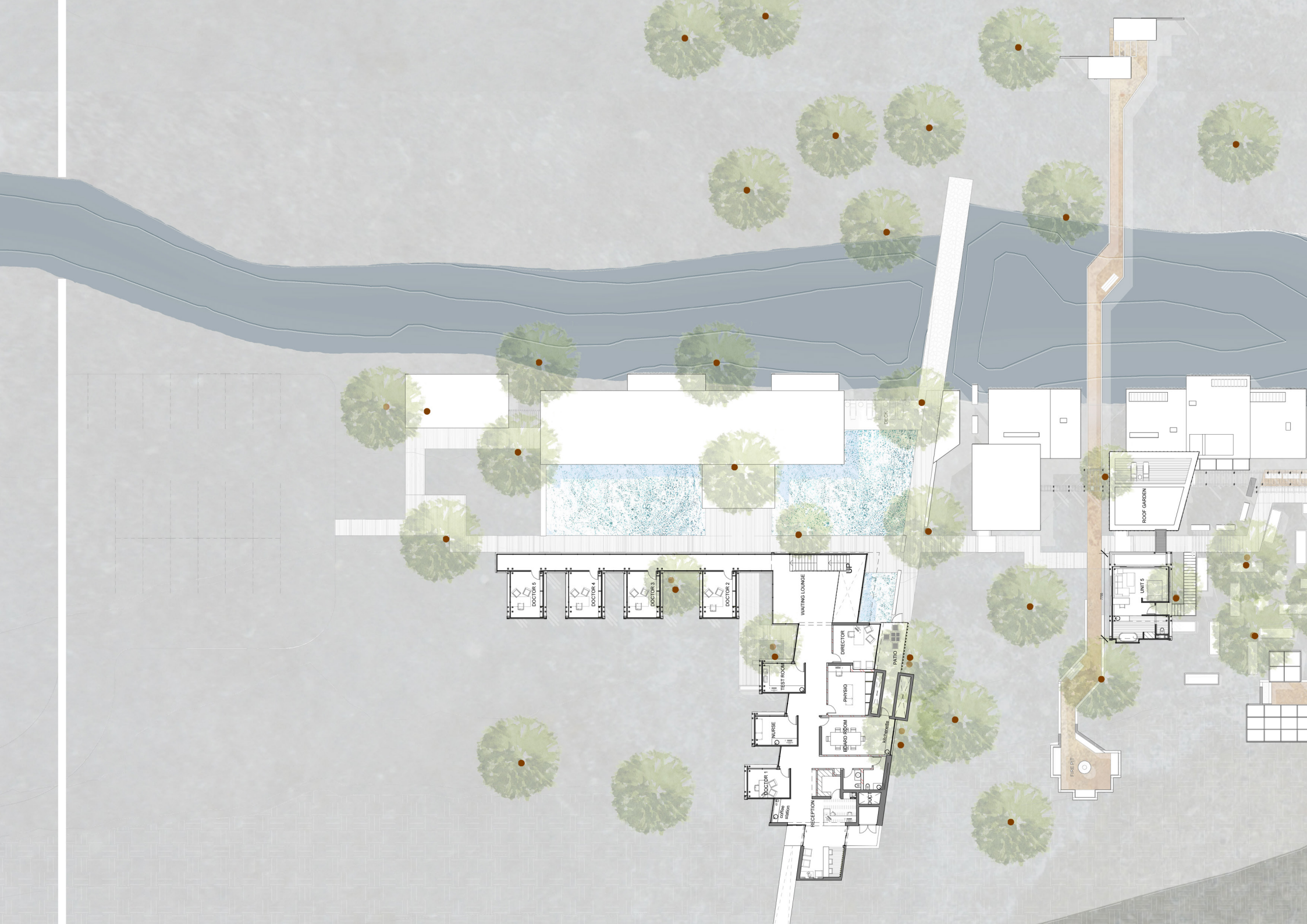
TOWARD A FINAL DESIGN

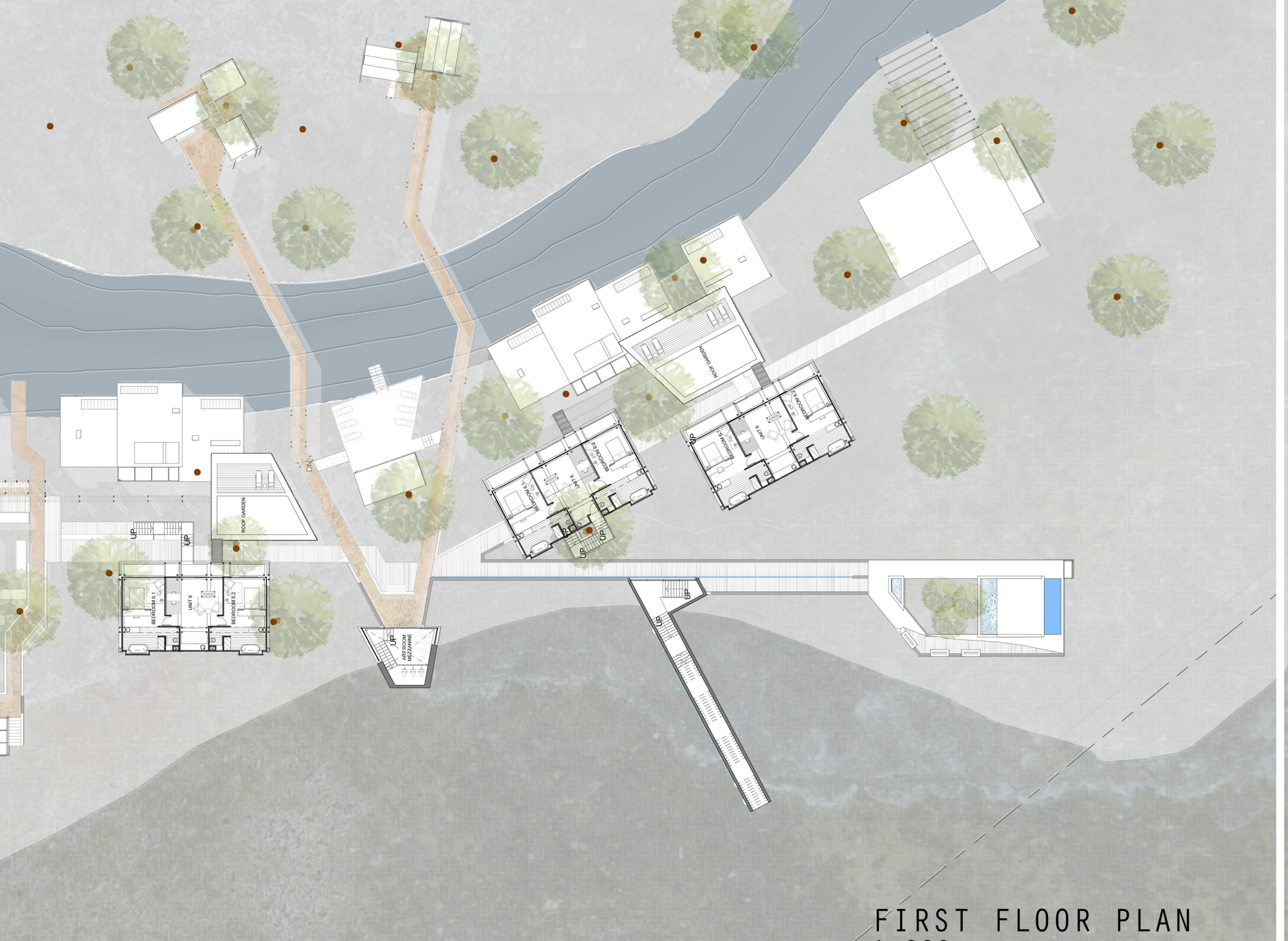



ROOF PLAN

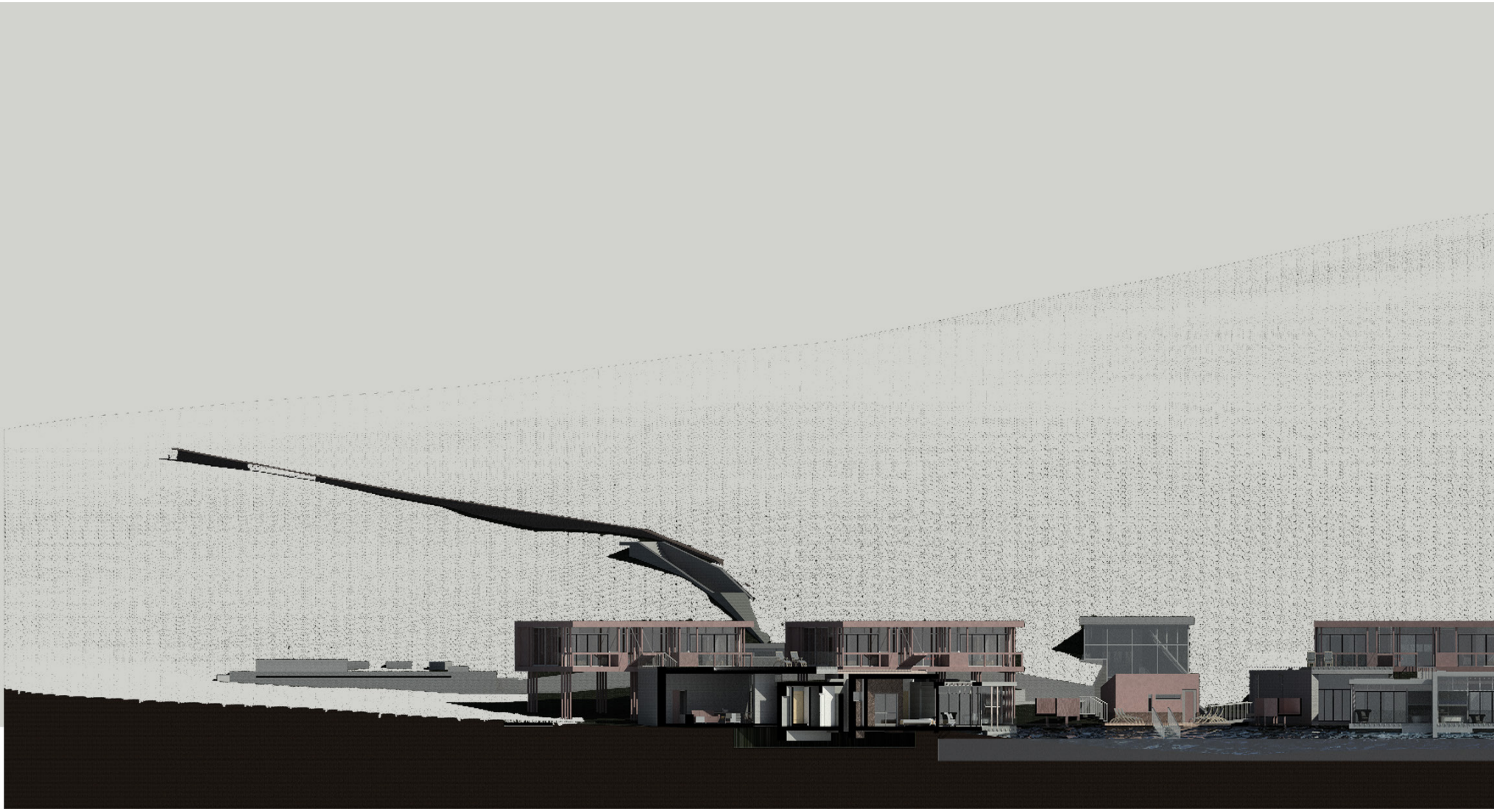
SAUNA 2
SAUNA 1
STAFF ROOM
STORE
LAUNDRY
KITCHEN
CAFETERIA
LOUNGE
LECTURE HALL
DECK
BEDROOM 1.1
UNIT 1
BEDROOM 2.1
BEDROOM 2.2
BEDROOM 2.3
UNIT 2
FILTRATION & BOTTLING ROOM
MASSAGE PARLOR
STORE
SERVICE PASSAGE
CLEANSING RITUAL
MACHINE ROOM
FIRE PIT
OFFICE
GREEN HOUSE

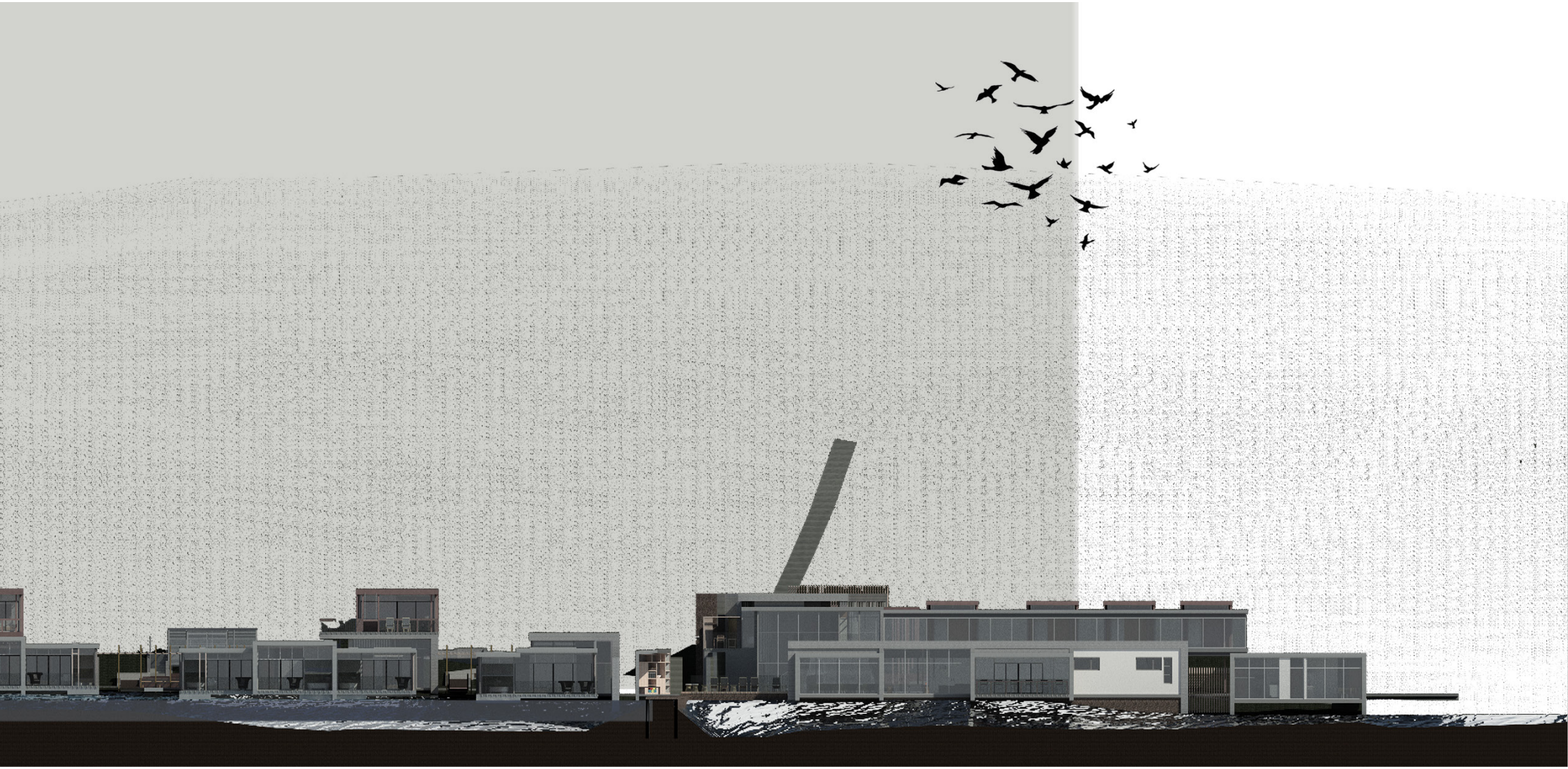

BEDROOM 3.3
BEDROOM 3.2
BEDROOM 3.1
UNIT 3
DN
LIBRARY
ART ROOM
BEDROOM 3.3
BEDROOM 3.2
BEDROOM 3.1
UNIT 3
DECK
YOGA STUDIO
REFLEXION

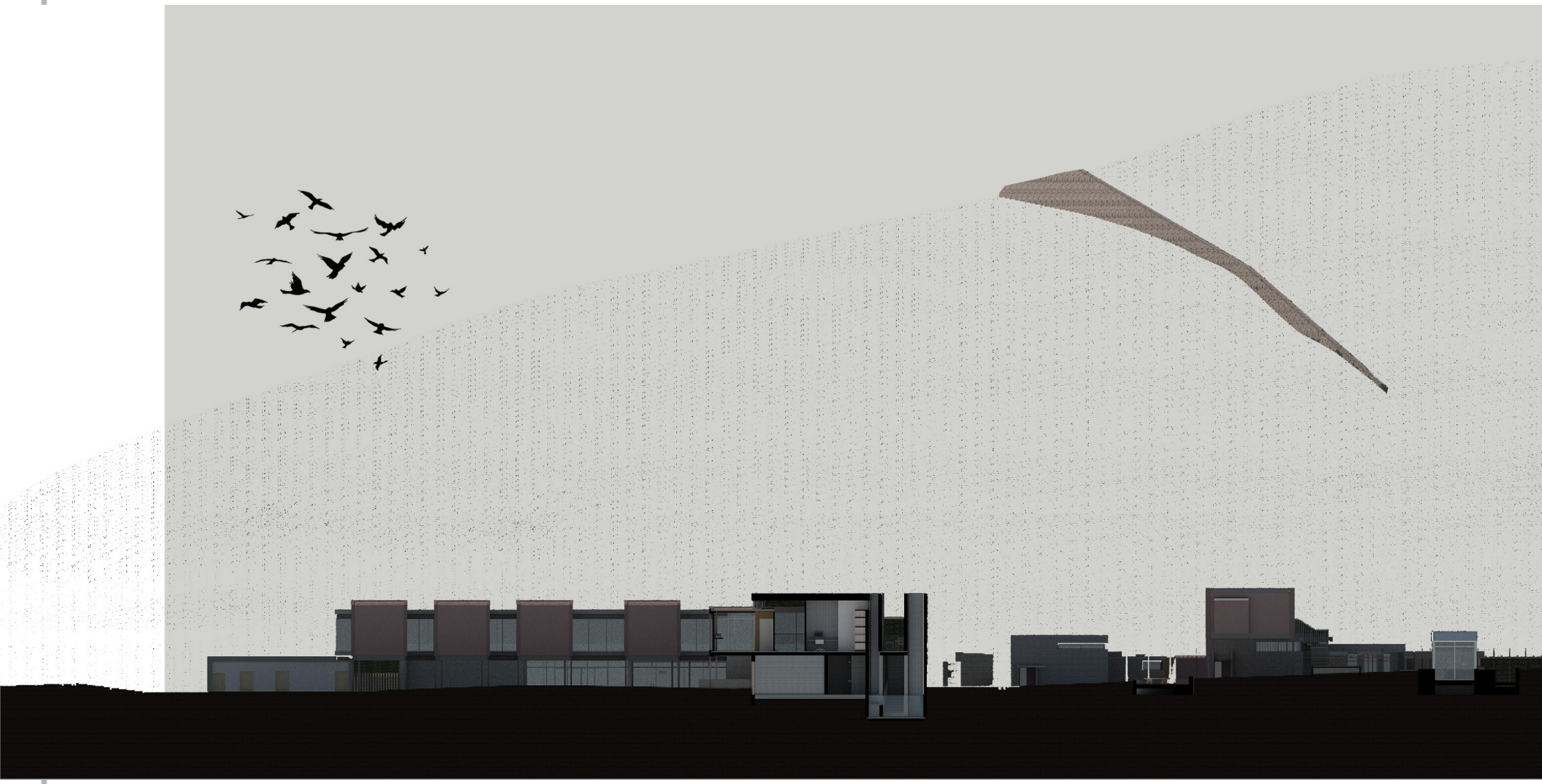

DECK
ROOF GARDEN
UNIT 5
FIRE PIT
DOCTOR 5
DOCTOR 4
DOCTOR 3
DOCTOR 2
WAITING LOUNGE
UP
DIRECTOR
PATIO
TEST ROOM
PHYSIO
NURSE
BOARD ROOM
Michaela
DOCTOR 1
RECEPTION

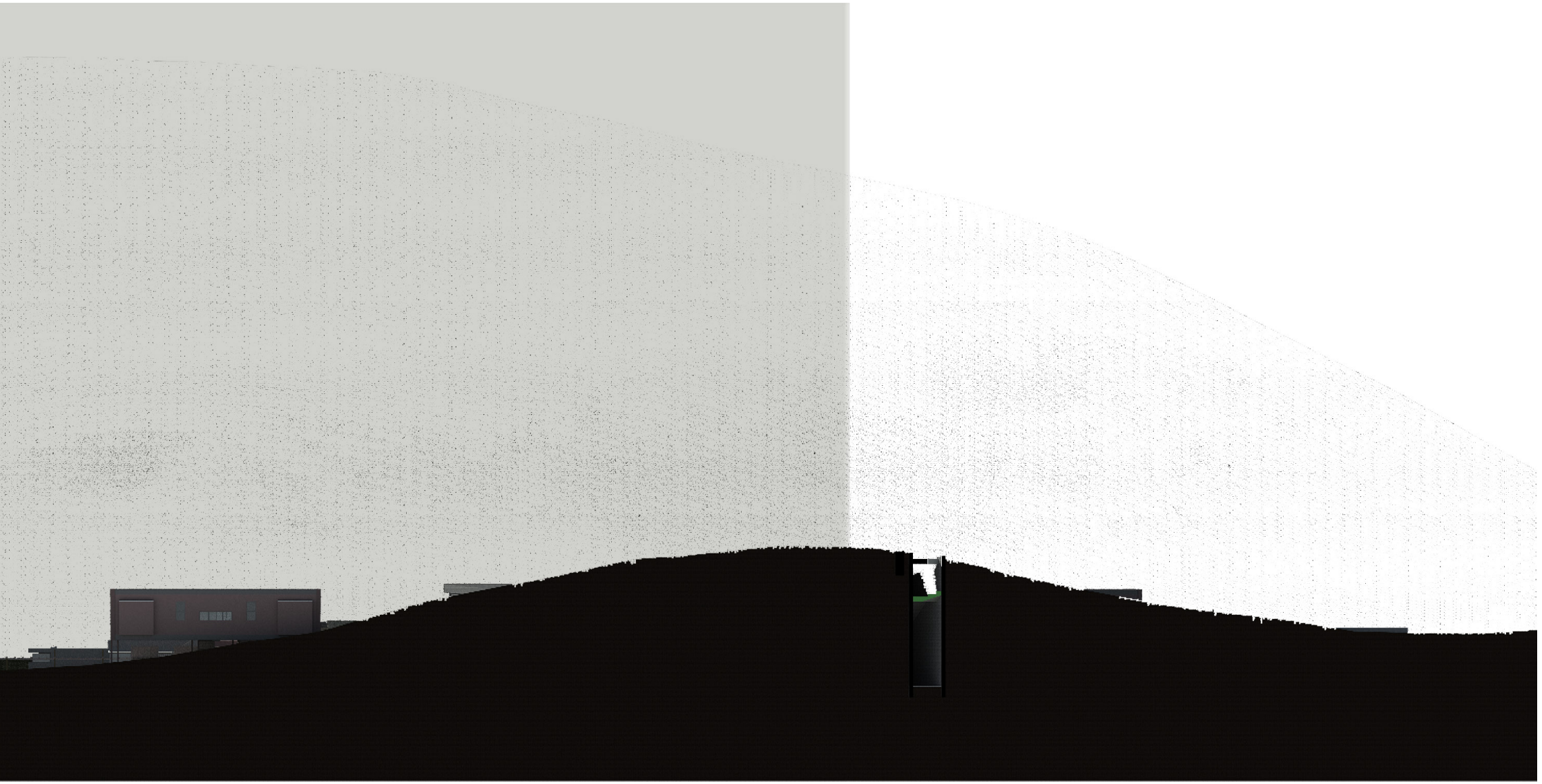


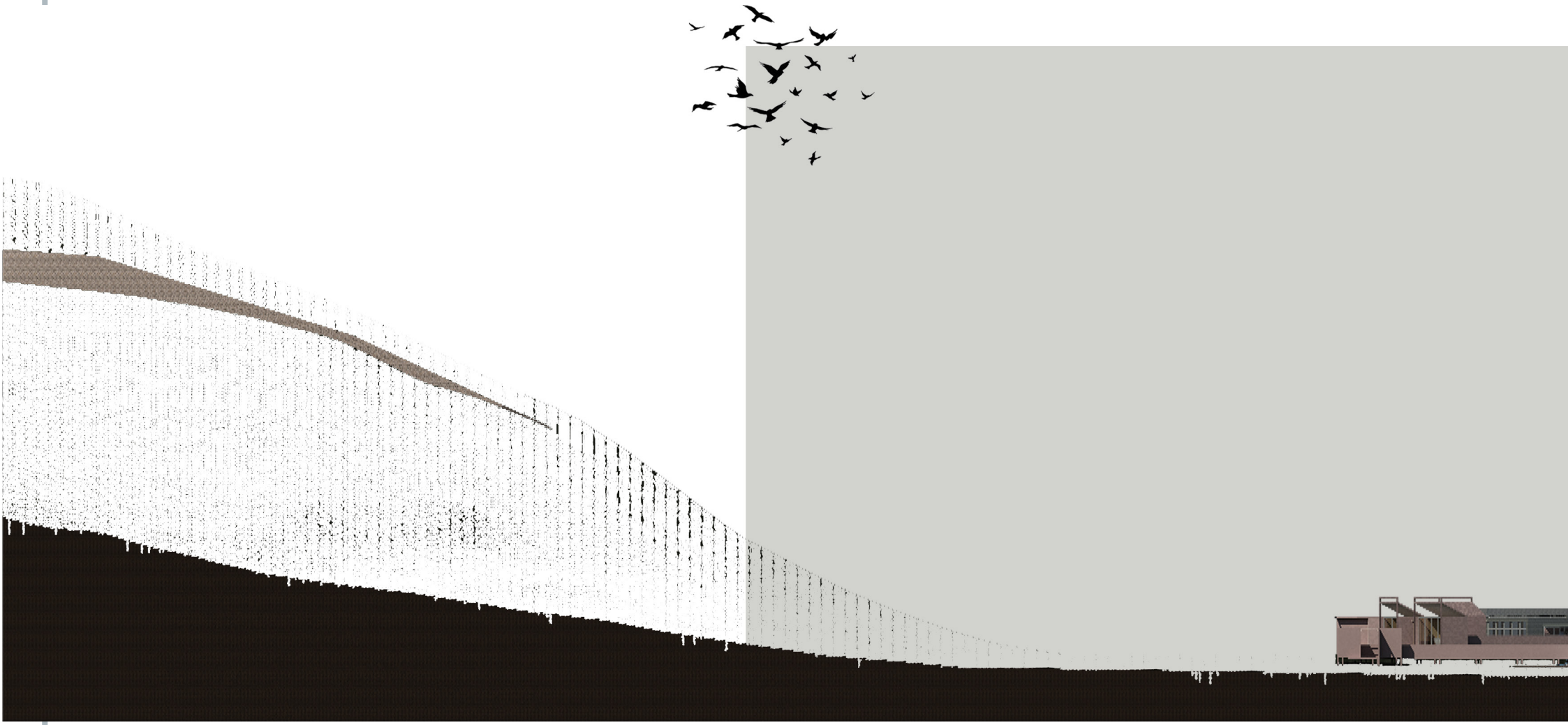
FIRST FLOOR PLAN

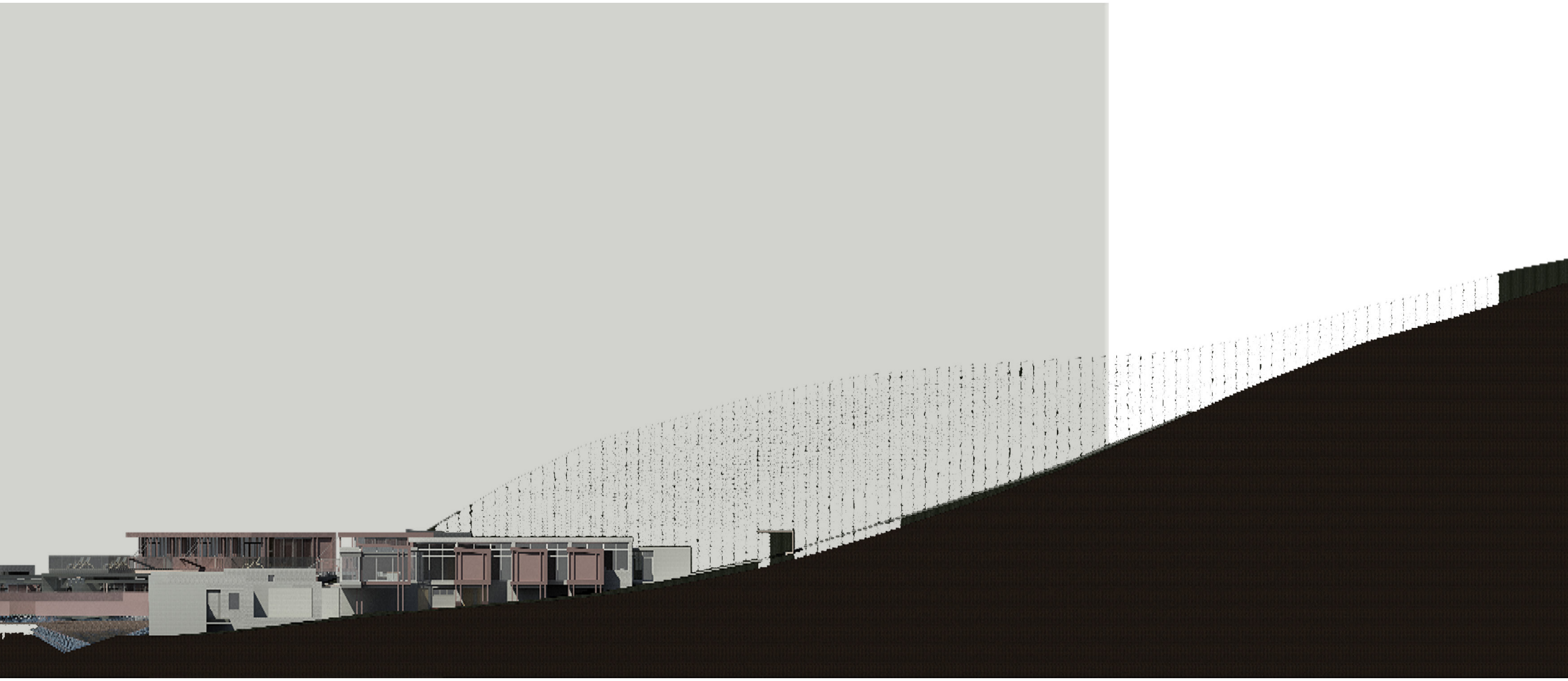


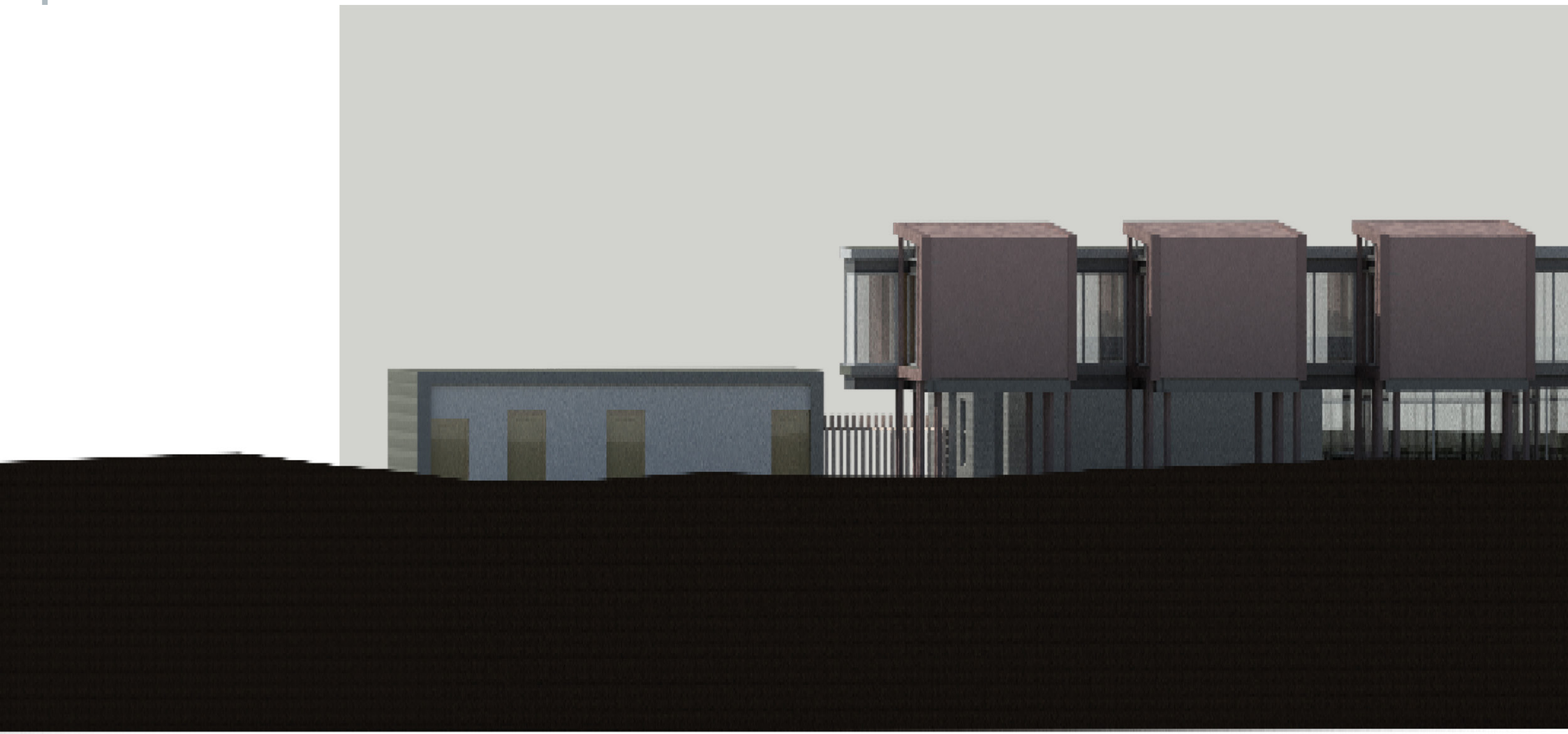


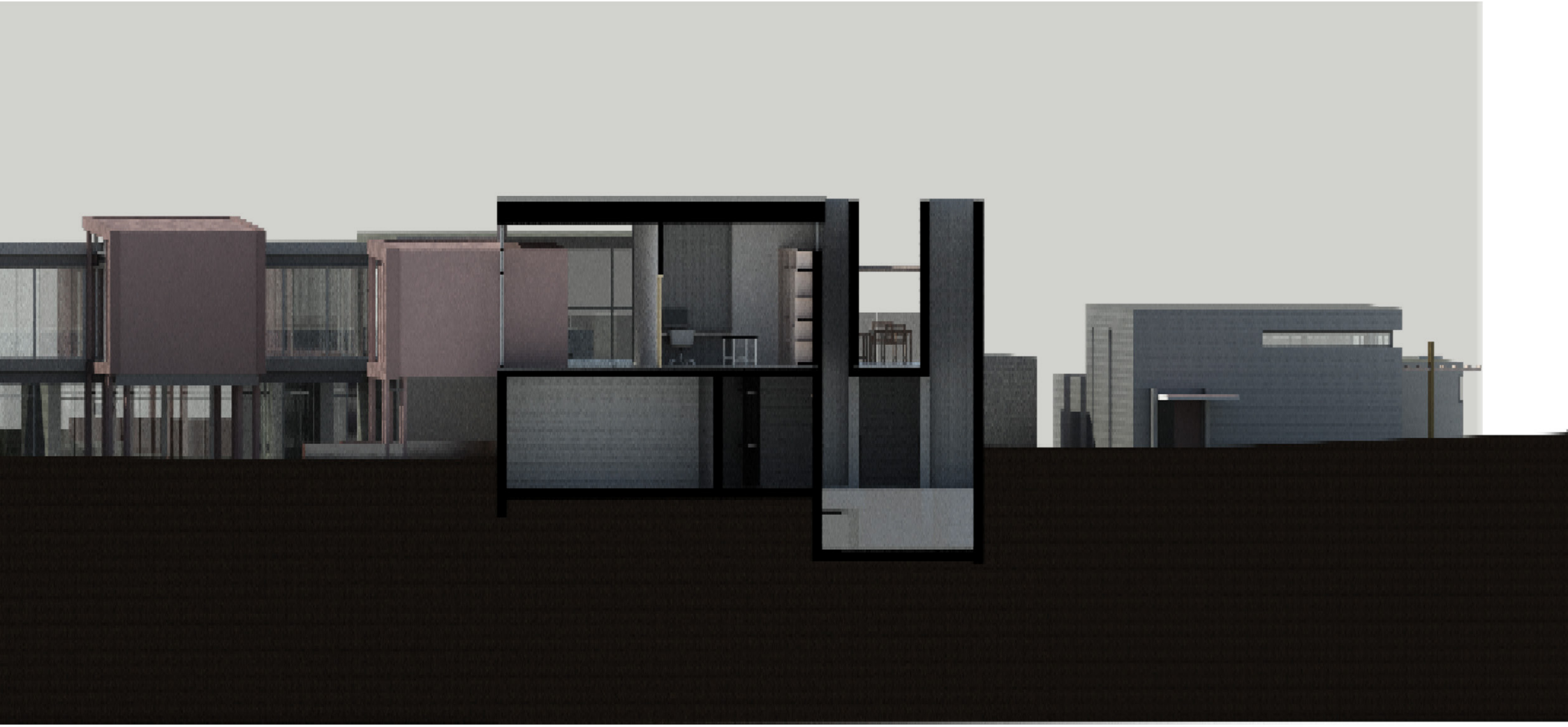


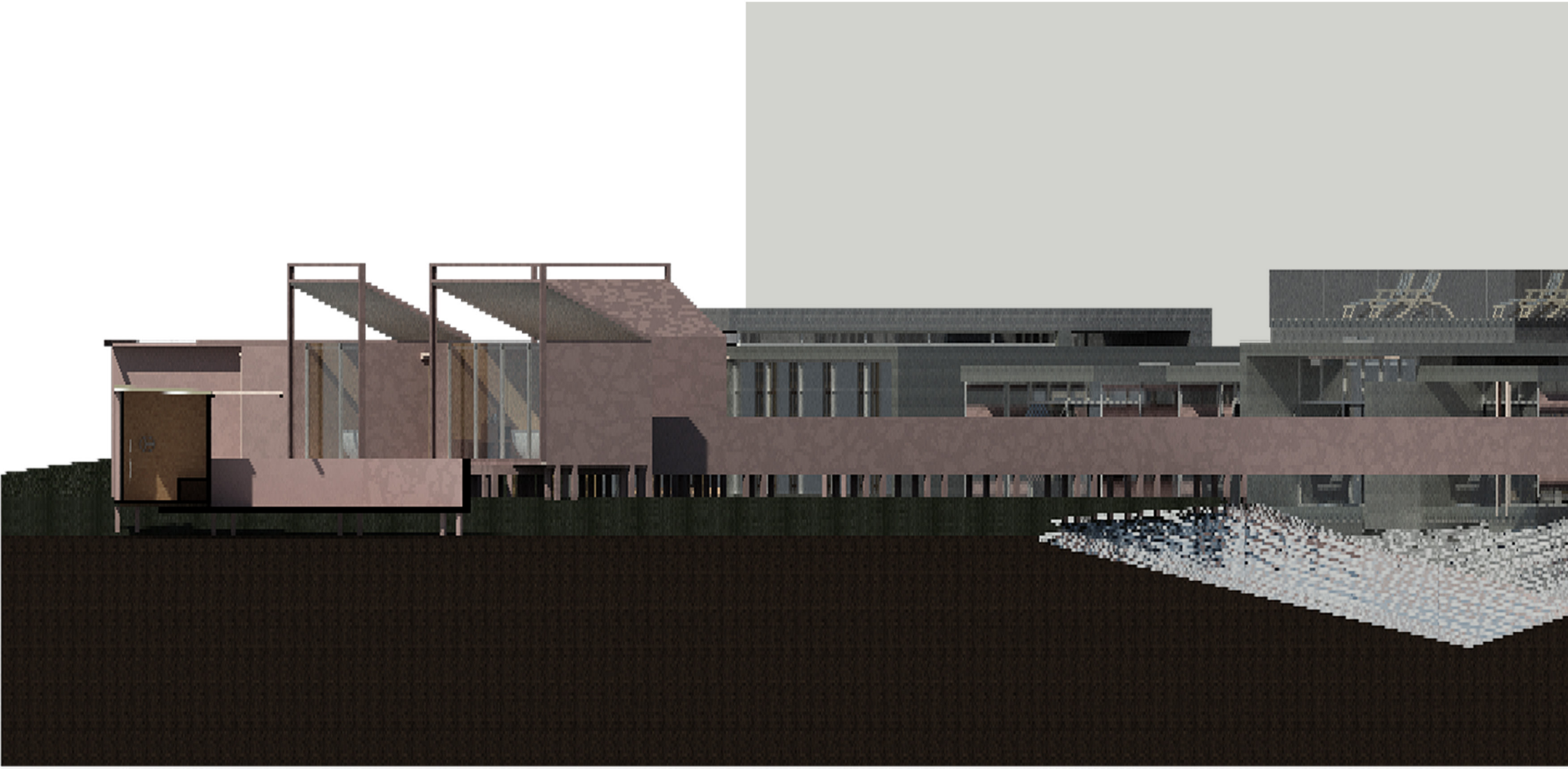


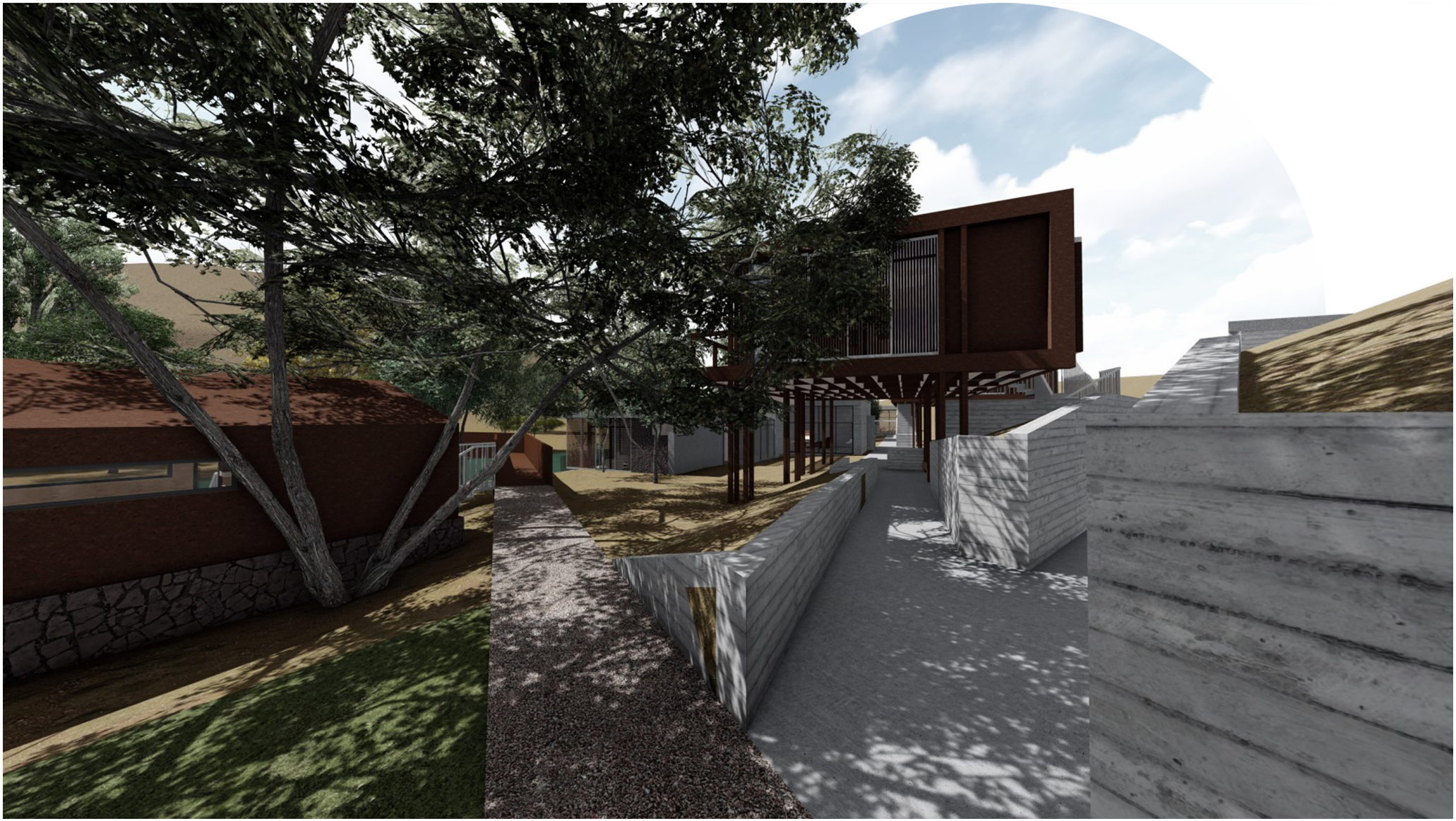


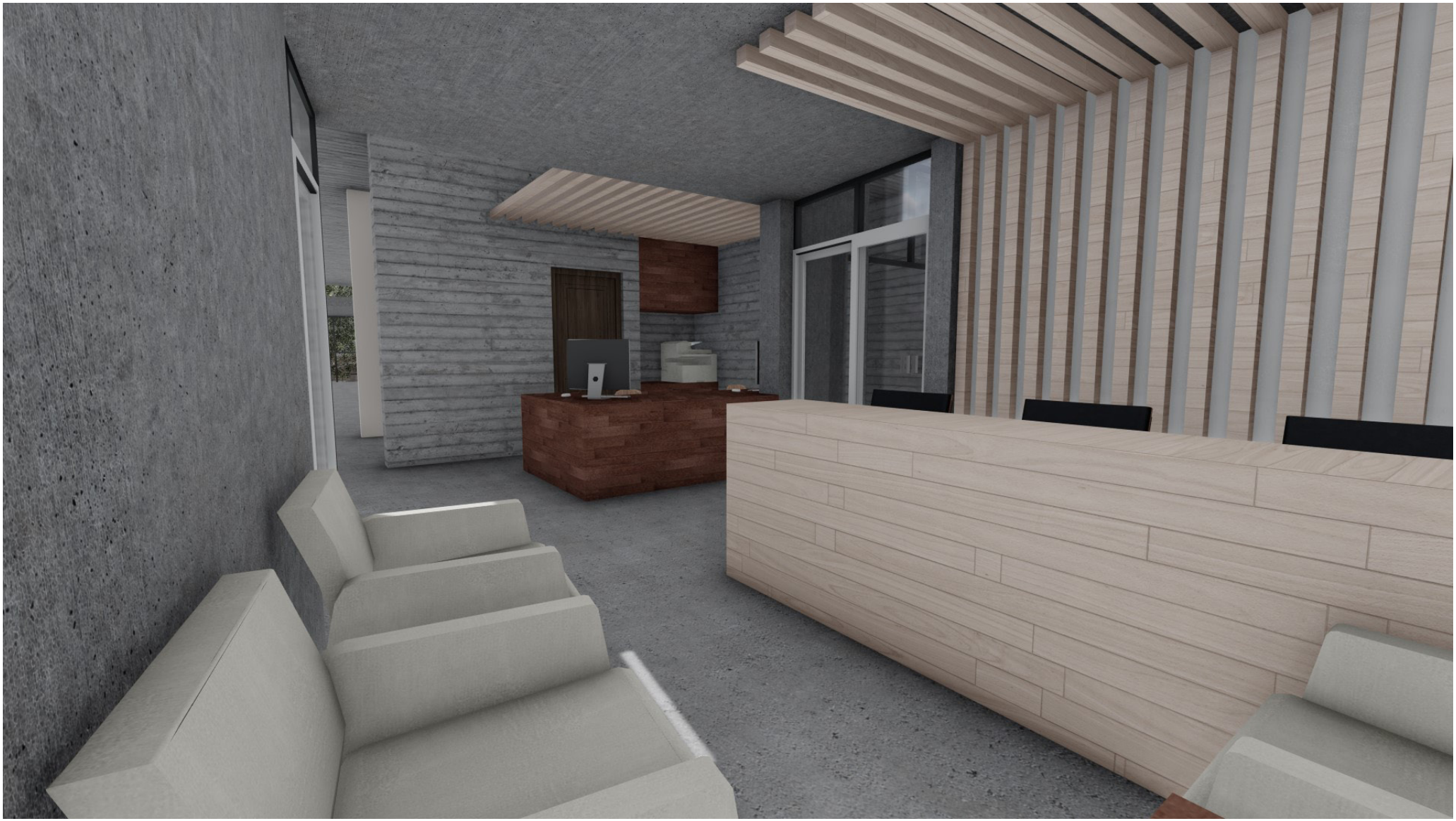


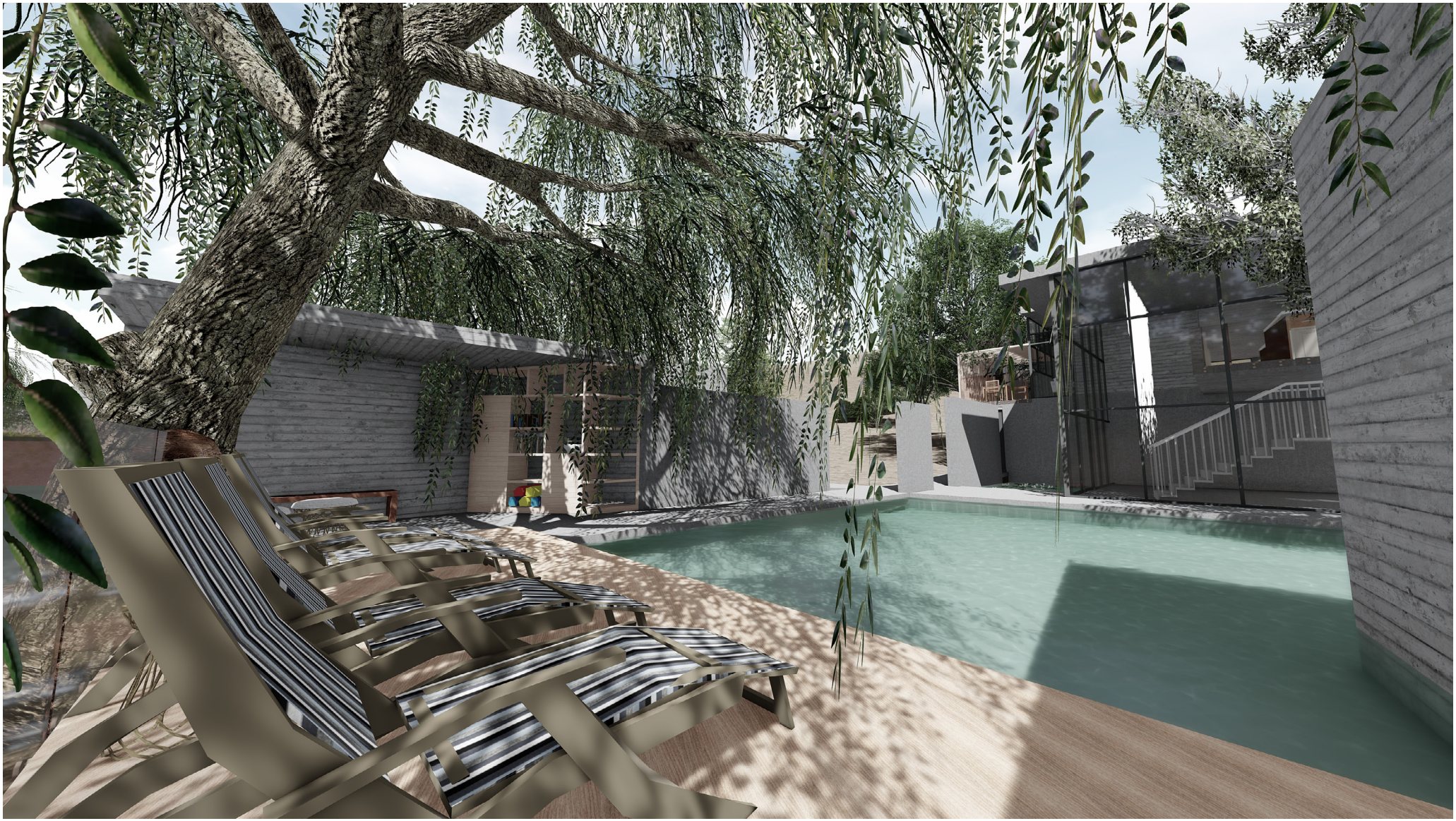


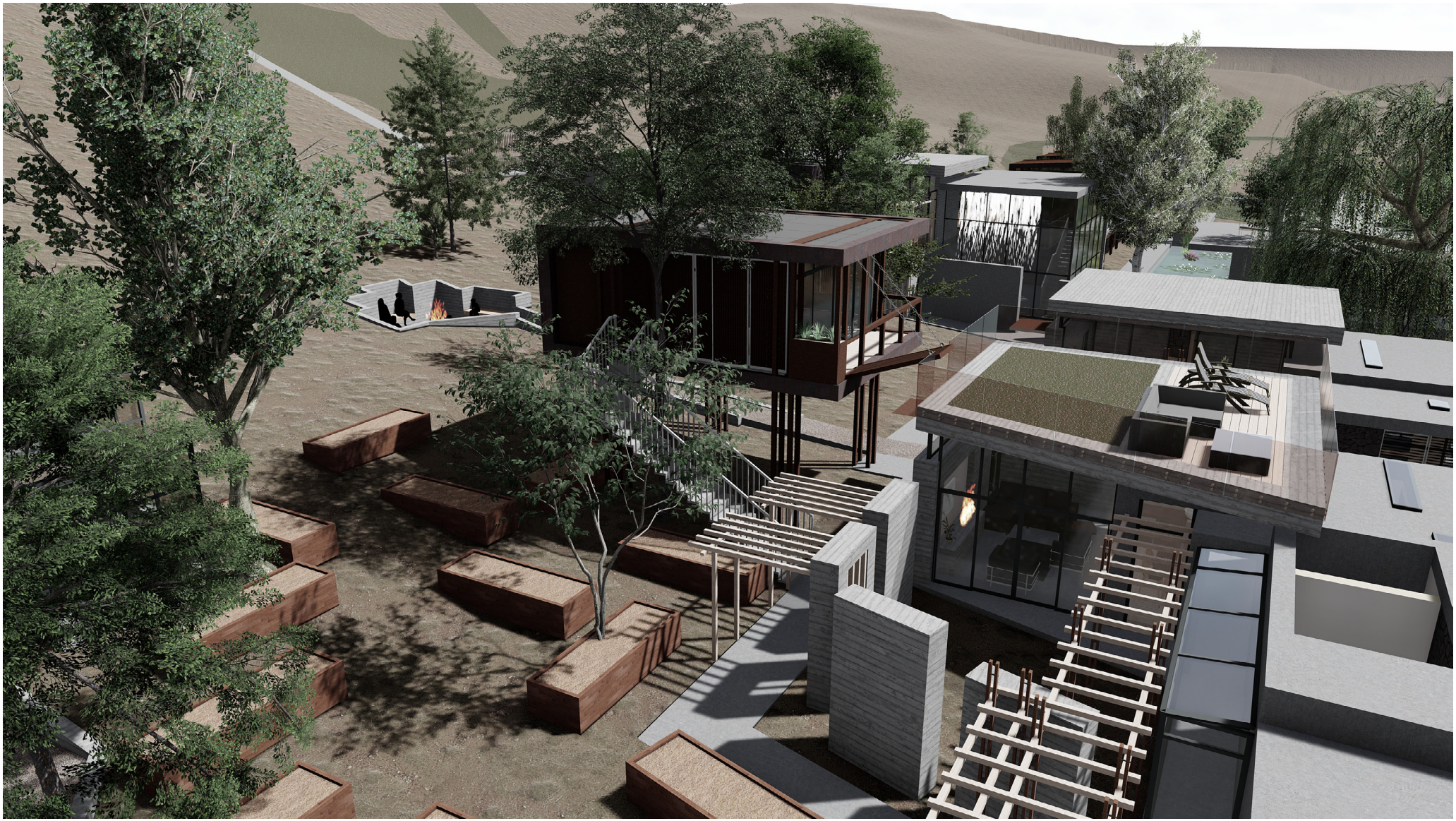


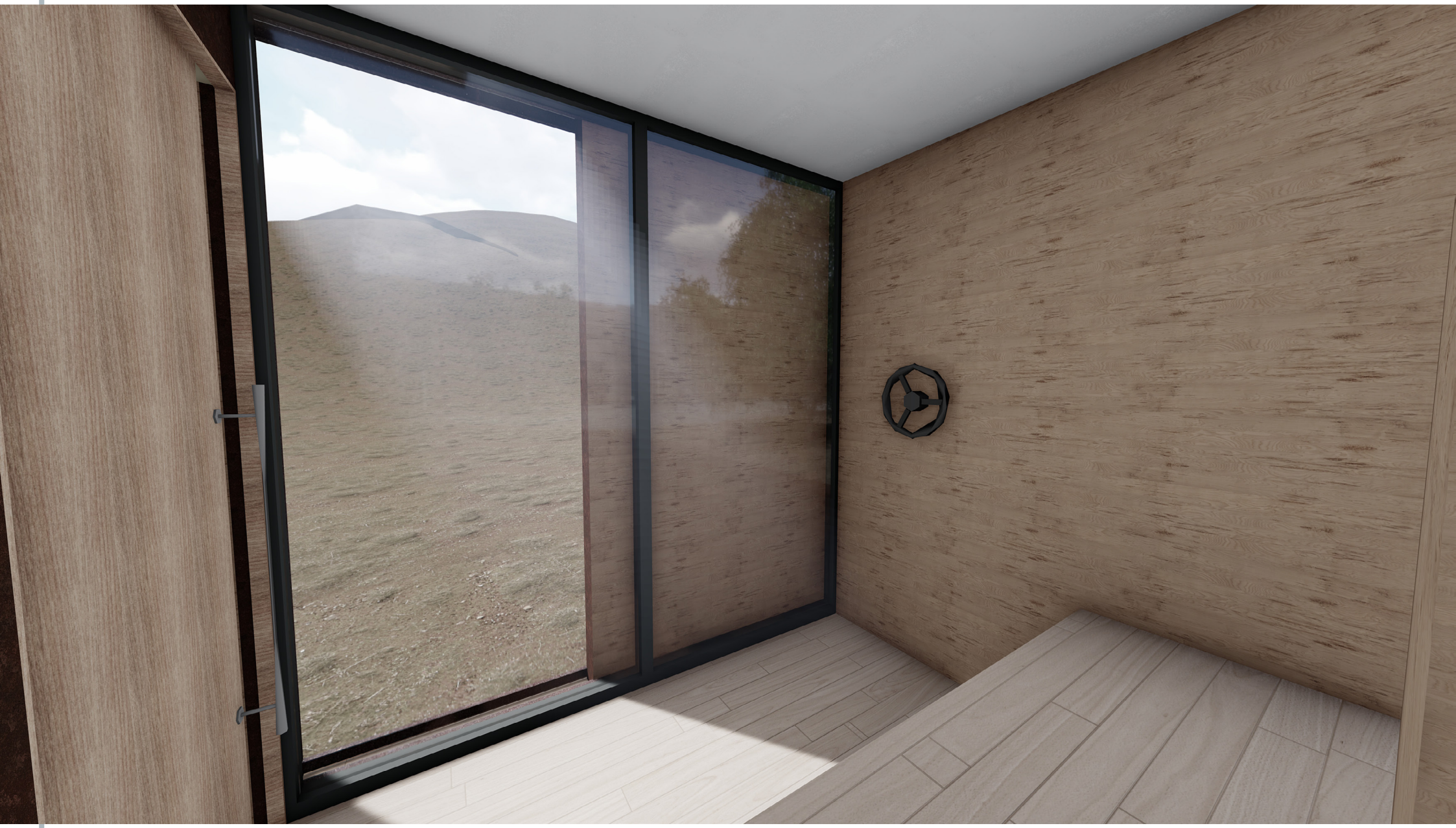












PART 6

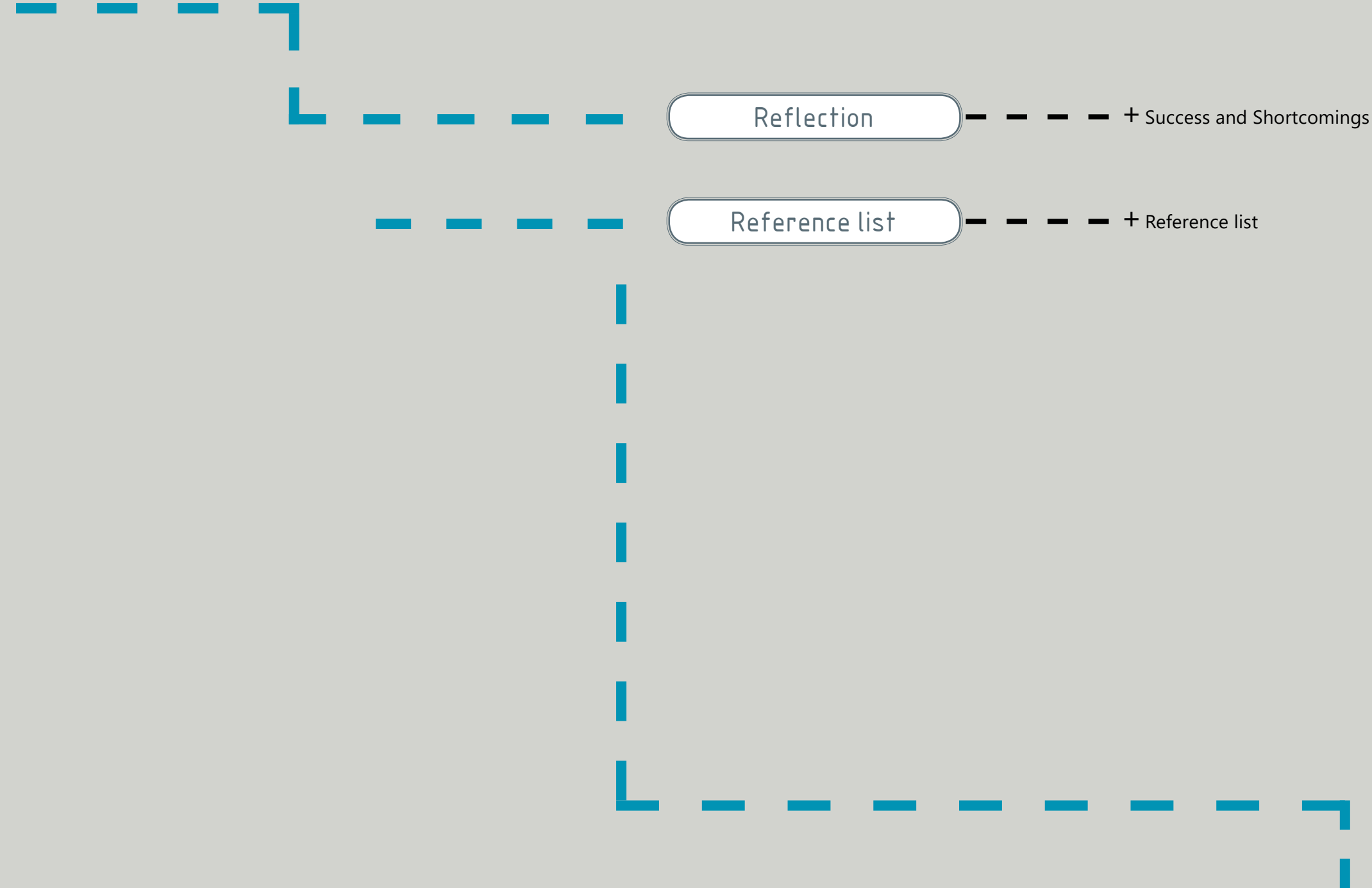
REFLECTION AND EVALUATION

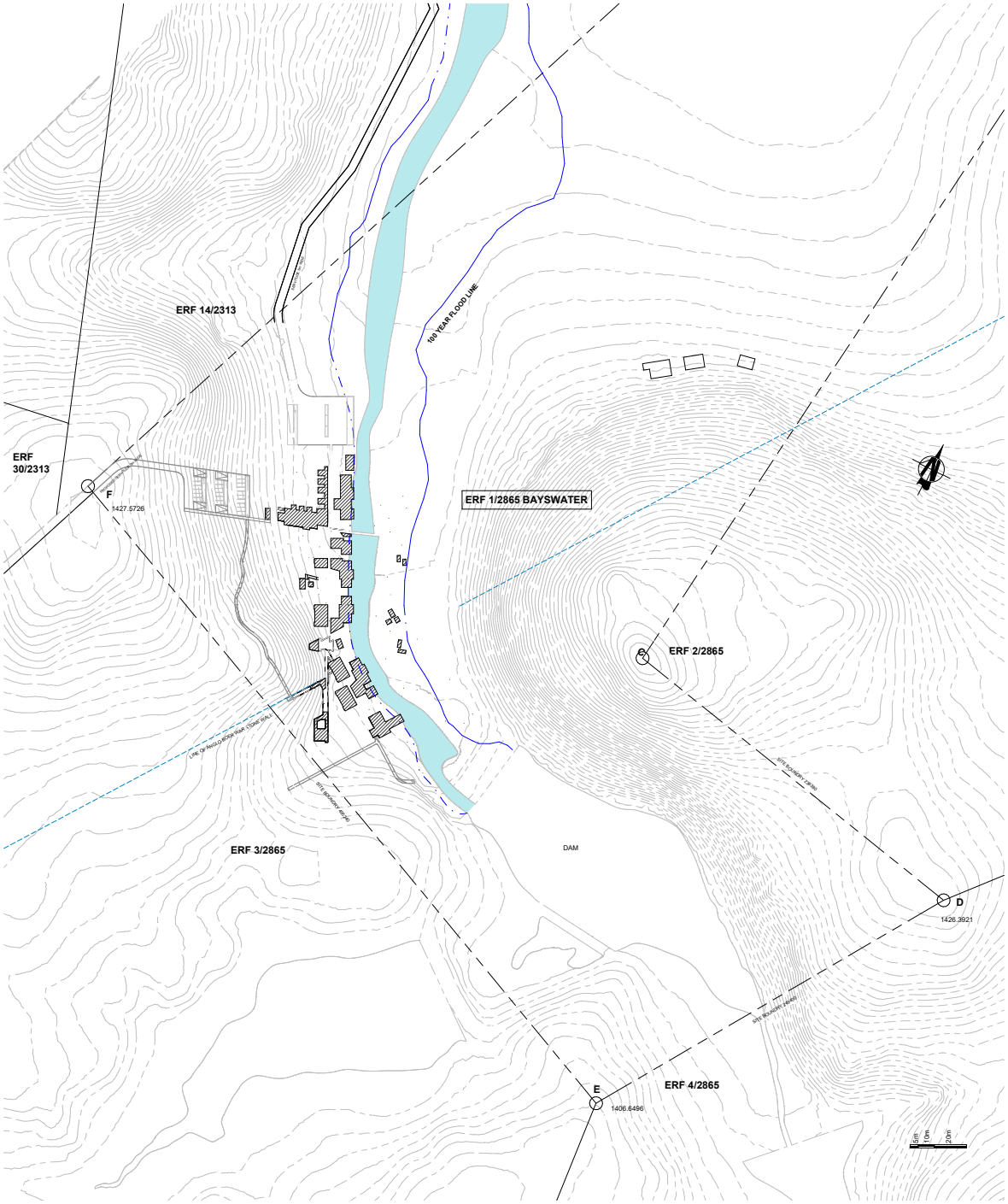
+ Reflection:

Proposing a Water Fasting Center aims to grow the awareness of the natural tools available to humans, not only as healing methods, but as design tools through which architecture can become a space of individual narrative and exploration. I believe architecture should lend itself to become closer to nature, rather than dominate it, and this dissertation explored this.

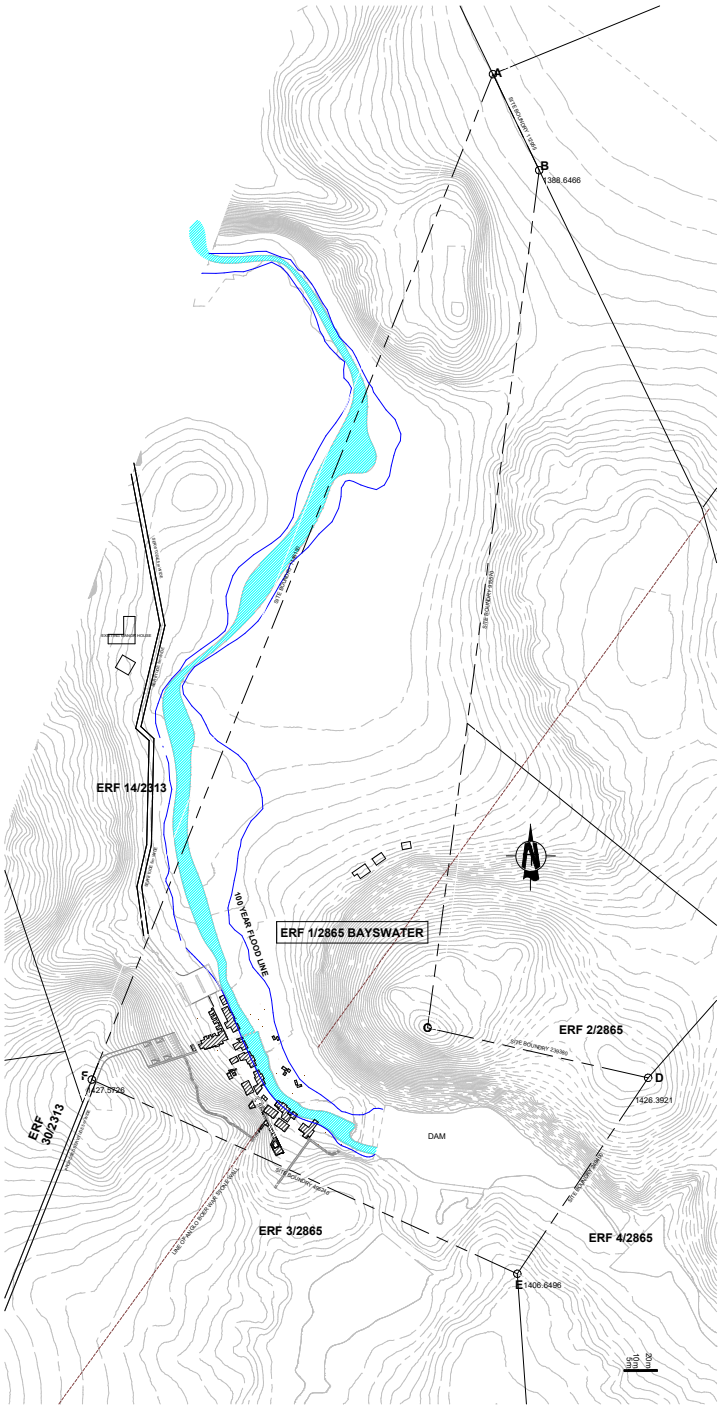
+ Personal statement:

The proposal aims to show the potential of the liminal as a tool of learning and discovery, using nature as a guiding tool. The liminal phase of the design process proved difficult as a designer. Many exploration into site selection proved the importance of locality when designing a space in which people step out of their comfort zone in order to discover a better self. The ritualization of the design process grew my understanding of the importance of knowledge in order to achieve a greater design and self.


Reflection
+ Success and Shortcomings
Reference list
+ Reference list



2 Site Plan
1 : 1000



1 Locality Plan
1 : 2000

NOTES

Coverage and FAR

Site	28.52ha
Ground floor	m²
Garage	m²
Total Ground Floor	m²
First floor	m²
Total First Floor	m²
Total area	m²
Coverage (max 40%)	%
FAR (max 0.40)	0.00

Revisions

No.	Description	Date	By
1	Client Approval	10 - 2019	PV

PROPOSED WATER ONLY FASTING CENTRE

Erf 1/2865
BAYSWATER,
BLOEMFONTEIN

Penny Vorster
Student

Student Signature

Date

Student No: 2013021544

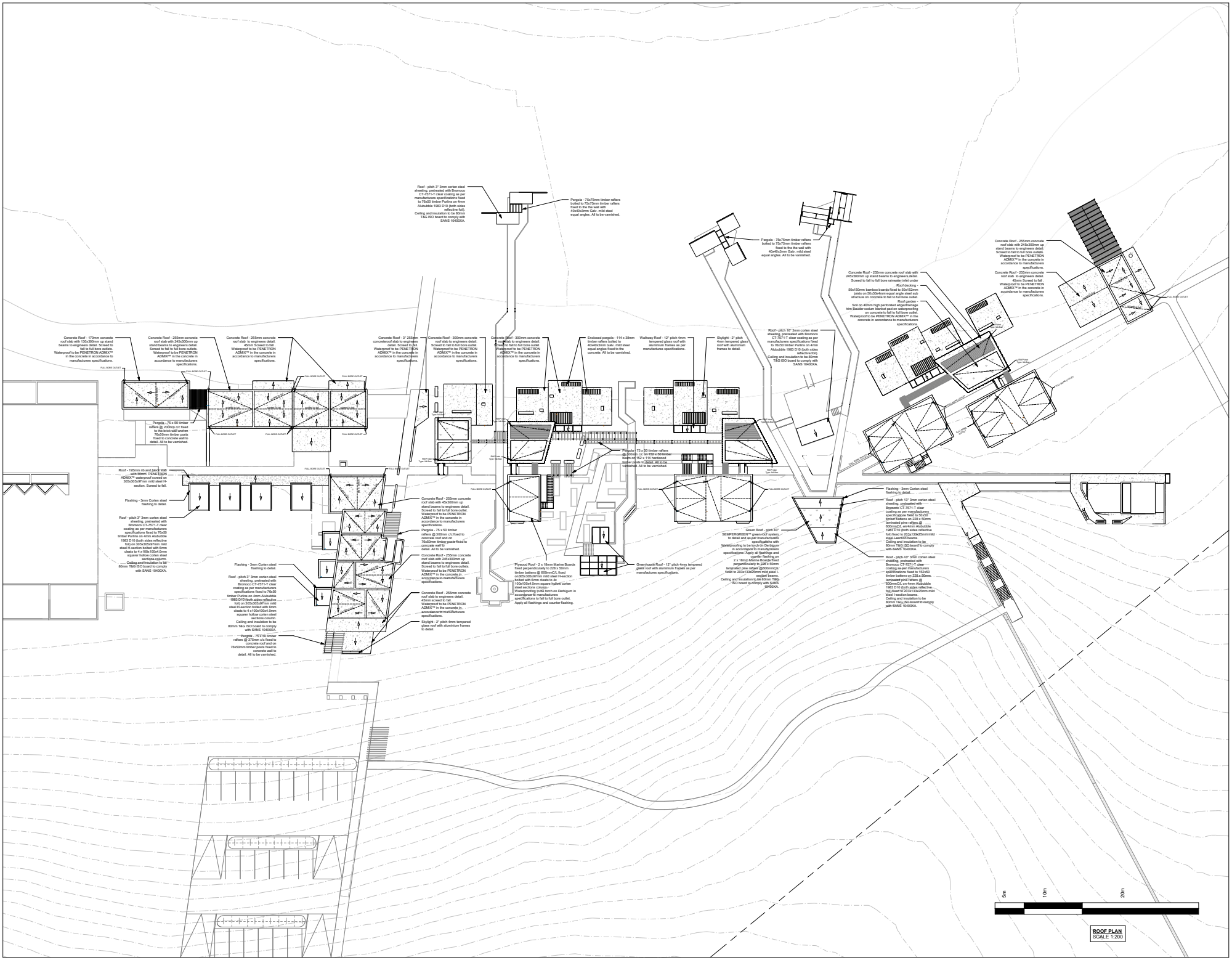
Description

Site Plan

Occupation Classification: H3

Scales : As Indicated

ARCH - A101



NOTES

Coverage and FAR	
Site	28.52ha
Ground floor	m²
Garage	m²
Total Ground Floor	m²
First floor	m²
Total First Floor	m²
Total area	m²
Coverage (max 40%)	%
FAR (max 0.40)	0.00

Revisions

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PROPOSED WATER ONLY FASTING CENTRE

Erf 1/2865
BAYSWATER,
BLOEMFONTEIN

Penny Vorster
Student
Student Signature
Date
Student No: 2013021544

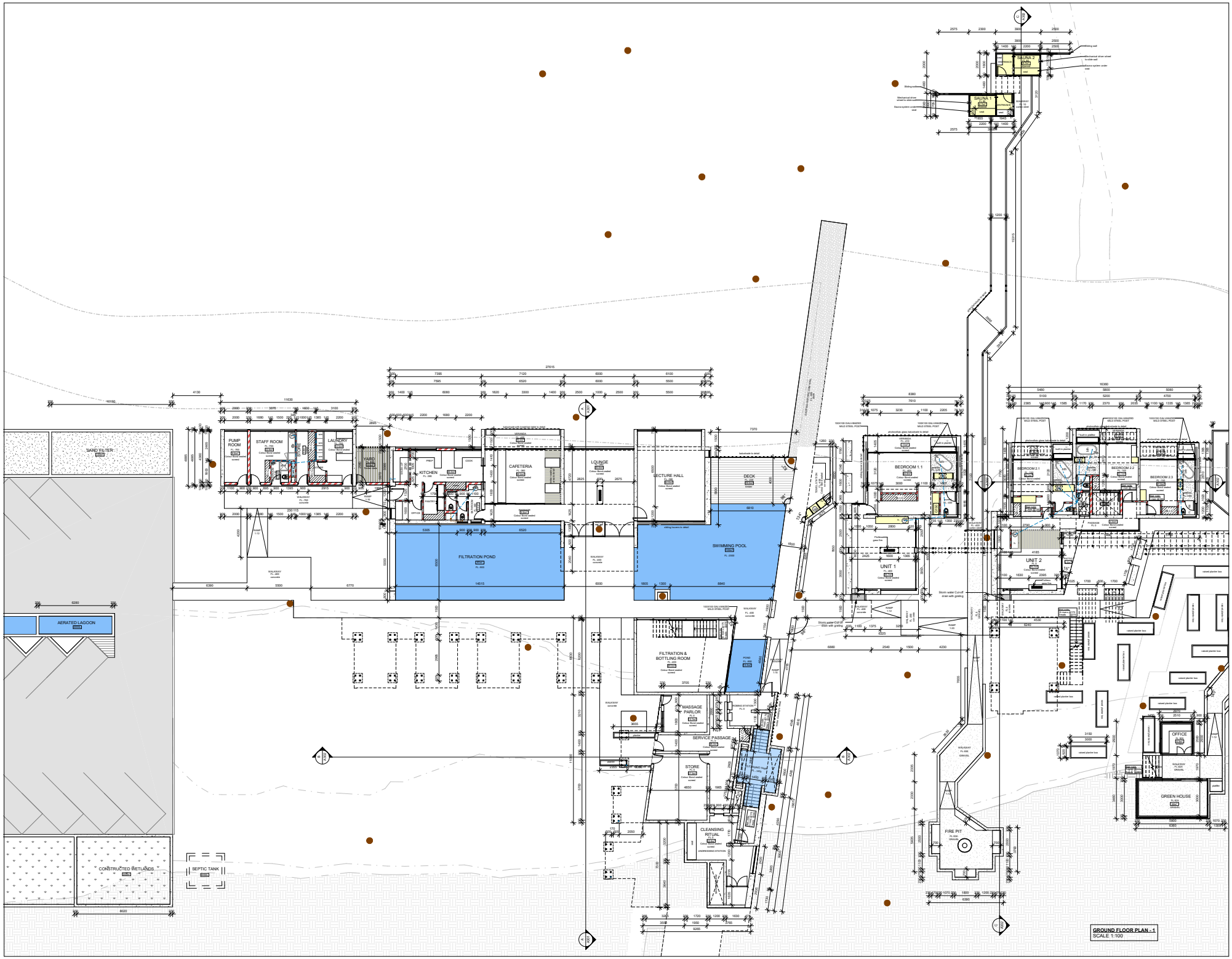
Description

Roof & Landscaping Plan

Occupation Classification: H3

Scales : As Indicated

ARCH - A102



NOTES

Coverage and FAR	
Site	28.52ha
Ground floor	m²
Garage	m²
Total Ground Floor	m²
First floor	m²
Total First Floor	m²
Total area	m²
Coverage (max 40%)	%
FAR (max 0.40)	0.00

Revisions

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PROPOSED WATER ONLY FASTING CENTRE

Erf 1/2865
BAYSWATER,
BLOEMFONTEIN

Penny Vorster
Student

Student Signature

Date

Student No: 2013021544

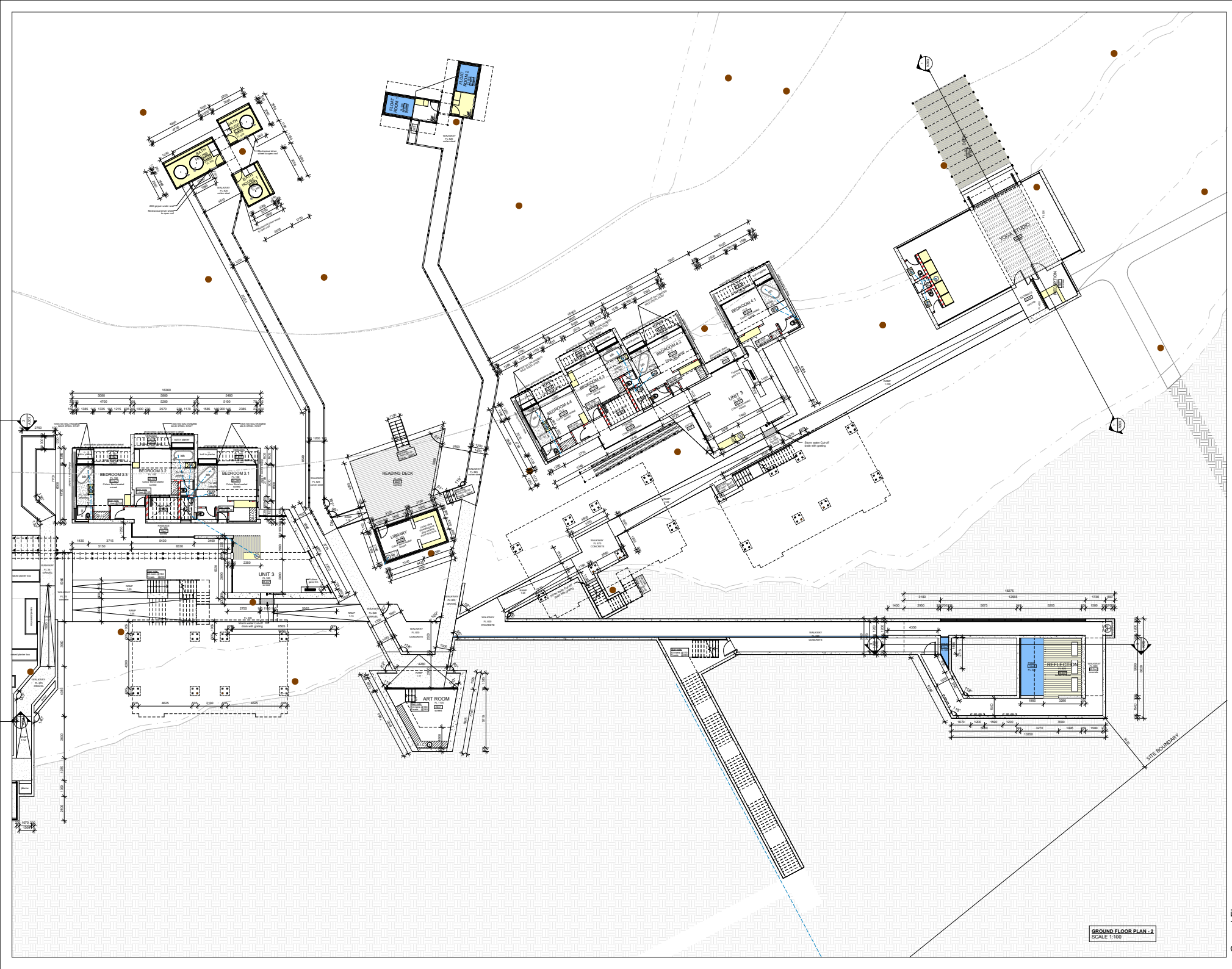
Description

Ground Floor 1

Occupation Classification: H3

Scales : As Indicated

ARCH - A103



GROUND FLOOR PLAN - 2
SCALE 1:100

NOTES

Coverage and FAR

Site		28.52ha
Ground floor	m²	
Garage	m²	
Total Ground Floor	m²	
First floor	m²	
Total First Floor	m²	
Total area	m²	
Coverage (max 40%)	%	
FAR (max 0.40)	0.00	

Revisions

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PROPOSED WATER ONLY FASTING CENTRE

Erf 1/2865
BAYSWATER,
BLOEMFONTEIN

Penny Vorster
Student

Student Signature

Date

Student No: 2013021544

Description
Ground floor 2

Occupation Classification: H3

Scales : As Indicated

ARCH - A 104

Ground Floor
1

UPPER GROUND FLOOR PLAN - 1
SCALE 1:100

NOTES

Coverage and FAR

Site		28.52ha
Ground floor		m²
Garage		m²
Total Ground Floor		m²
First floor		m²
Total First Floor		m²
Total area		m²
Coverage (max 40%)		%
FAR (max 0.40)		0.00

Revisions

No	Description	Date	By
1	Client Approval	10 - 2019	PV

PROPOSED WATER ONLY FASTING CENTRE

Erf 1/2865
BAYSWATER,
BLOEMFONTEIN

Penny Vorster
Student

Student Signature

Date

Student No: 201302 1544

Description

First floor 1

Occupation Classification: H3

Scales : As Indicated

ARCH - A105

UPPER GROUND FLOOR PLAN - 2
SCALE 1:100

NOTES

Coverage and FAR

Site		28.52ha
Ground floor	m²	
Garage	m²	
Total Ground Floor	m²	
First floor	m²	
Total First Floor	m²	
Total area	m²	
Coverage (max 40%)	%	
FAR (max 0.40)	0.00	

Revisions

No.	Description	Date	By
1	Client Approval	10 - 2019	PV

PROPOSED WATER ONLY FASTING CENTRE

Erf 1/2865
BAYSWATER,
BLOEMFONTEIN

Penny Vorster
Student

Student Signature

Date

Student No: 2013021544

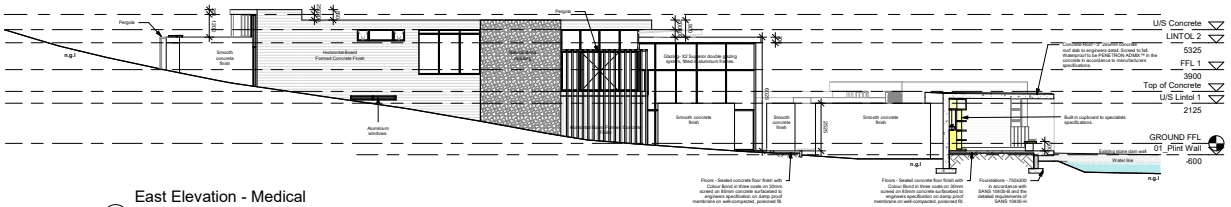
Description

First floor 2

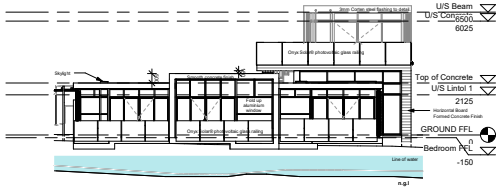
Occupation Classification: H3

Scales : As Indicated

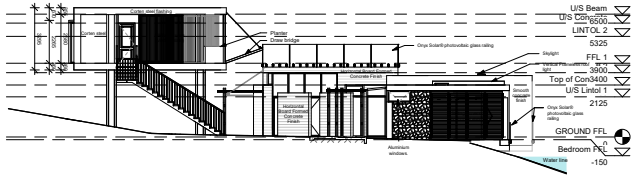
ARCH - A 106



1 East Elevation - Medical Centre
1 : 100

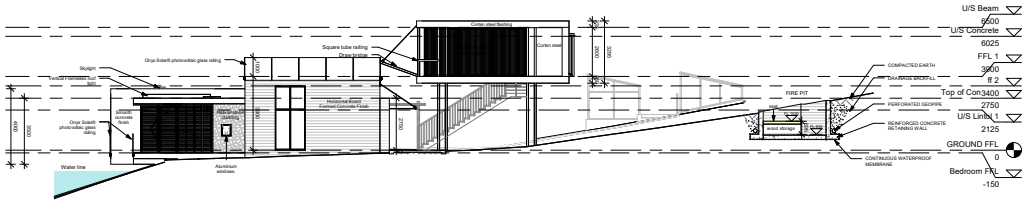


2 Typical North Elevation
1 : 100

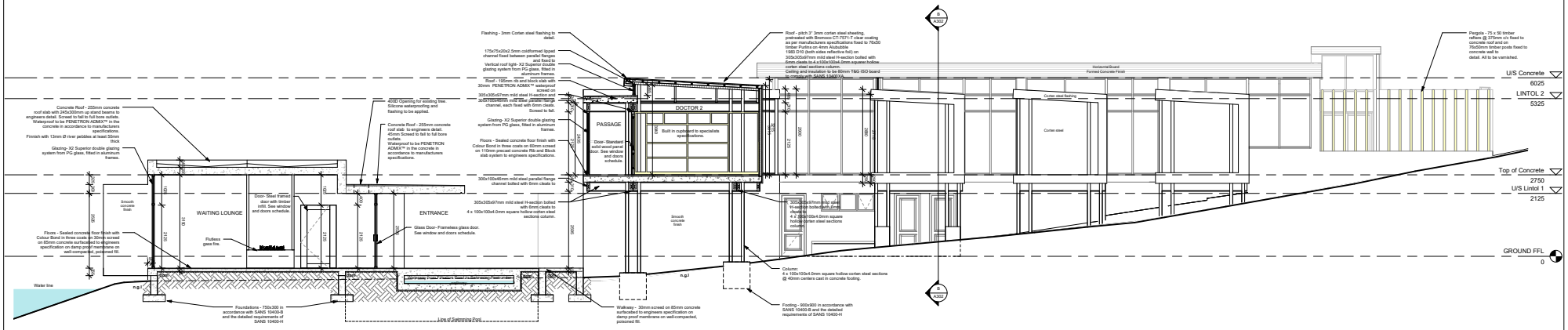


3 Typical East Elevation
1 : 100

4 Typical South Elevation
1 : 100



5 Typical West Elevation
1 : 100



A Section 1
1 : 50

NOTES

Coverage and FAR		
Site		28.52ha
Ground floor	m²	
Garage	m²	
Total Ground Floor	m²	
First floor	m²	
Total First Floor	m²	
Total area	m²	
Coverage (max 40%)	%	
FAR (max 0.40)	0.00	

Revisions

No.	Description	Date	By
1	Client Approval	10 - 2019	PV

PROPOSED WATER ONLY FASTING CENTRE

Erf 1/2865
BAYSWATER,
BLOEMFONTEIN

Penny Vorster
Student

Student Signature

Date

Student No: 2013021544

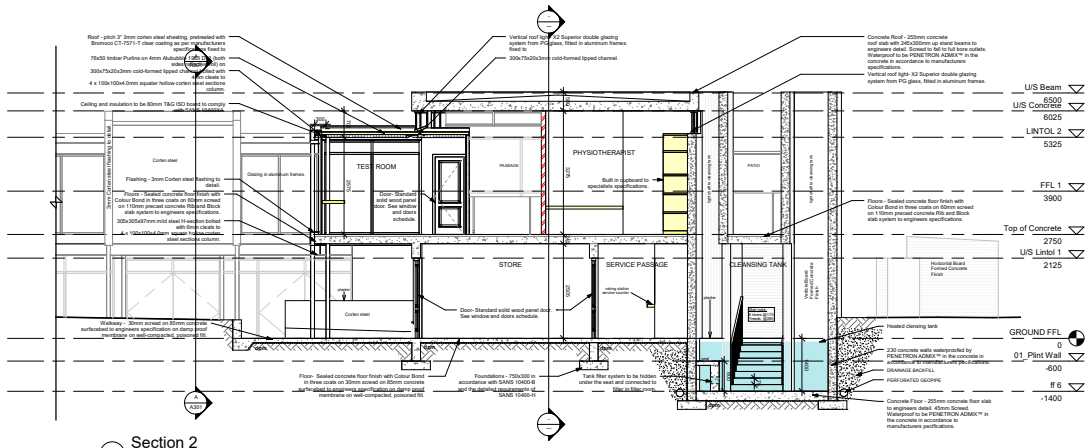
Description

Elevations & Sections

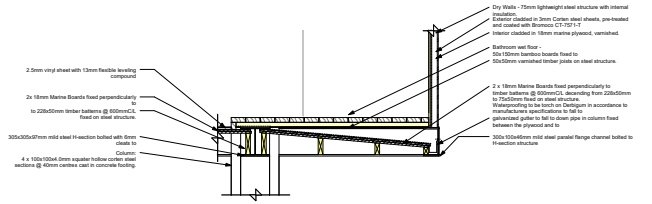
Occupation Classification: H3

Scales : As Indicated

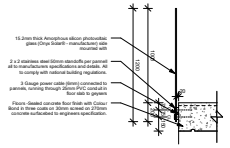
ARCH - A301



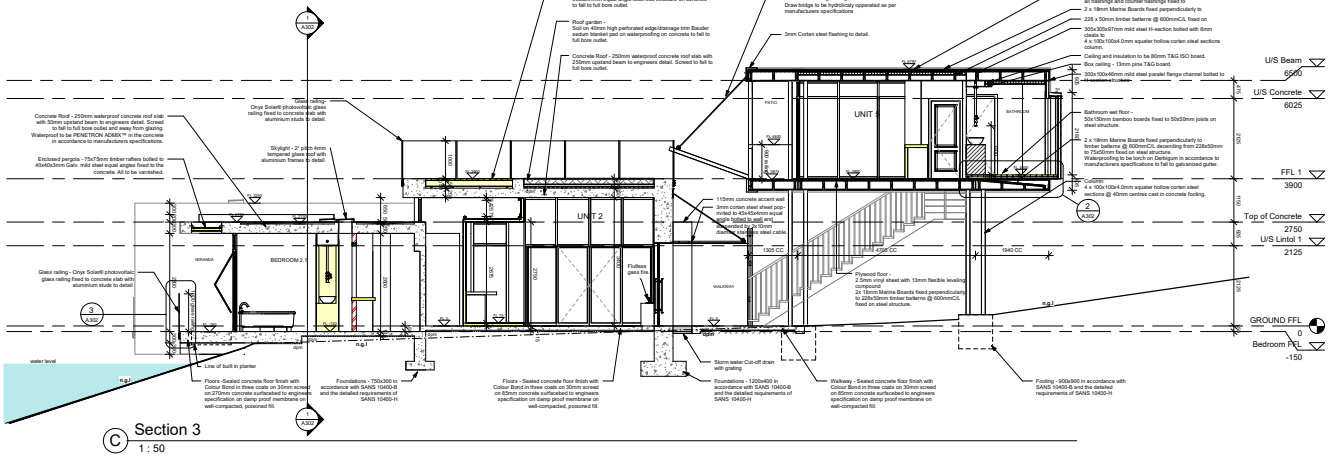
B Section 2
1 : 50



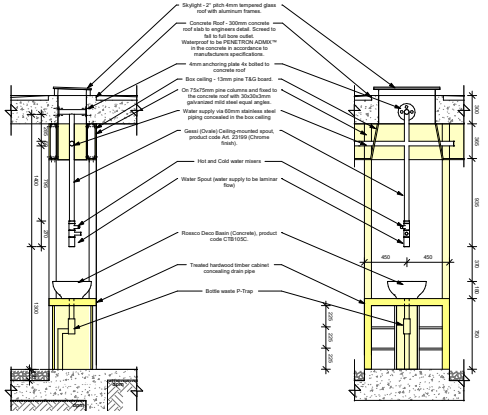
2 Section 3 - Callout 1
1 : 20



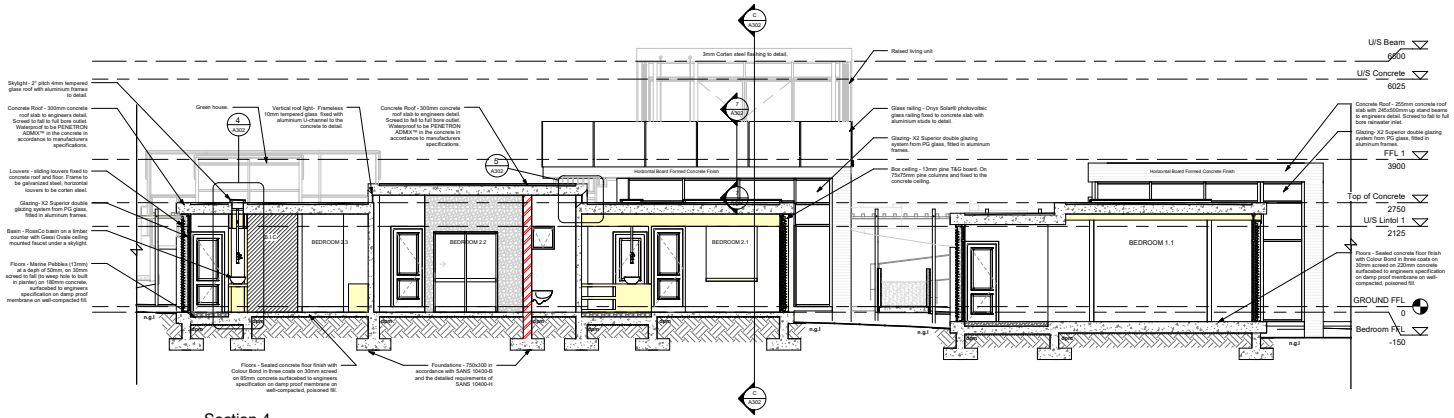
3 Section 3 - Callout 2
1 : 20



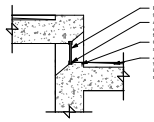
C Section 3
1 : 50



4 Section 4 - Callout 1
1 : 20



1 Section 4
1 : 50



5 Section 4 - Callout 2
1 : 20

NOTES

Coverage and FAR	
Site	28.52ha
Ground floor	m²
Garage	m²
Total Ground Floor	m²
First floor	m²
Total First Floor	m²
Total area	m²
Coverage (max 40%)	%
FAR (max 0.40)	0.00

Revisions

No	Description	Date	By
1	Client Approval	10 - 2019	PV

PROPOSED WATER ONLY FASTING CENTRE

Erf 1/2865
BAYSWATER,
BLOEMFONTEIN

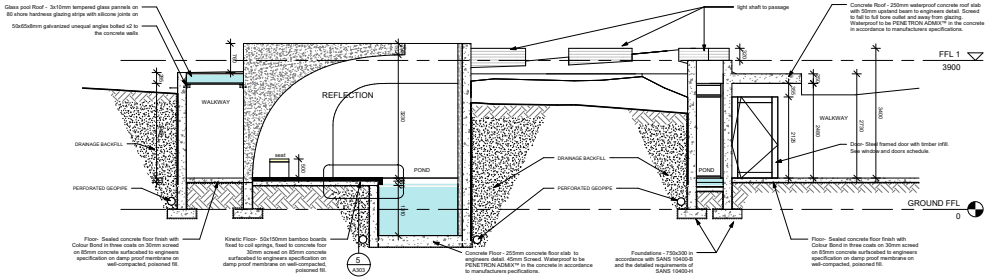
Penny Vorster
Student — Student Signature

Date — Student No: 201321544

Description
Sections

Occupation Classification: H3

Scales : As Indicated | ARCH - A302



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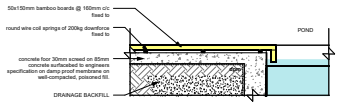
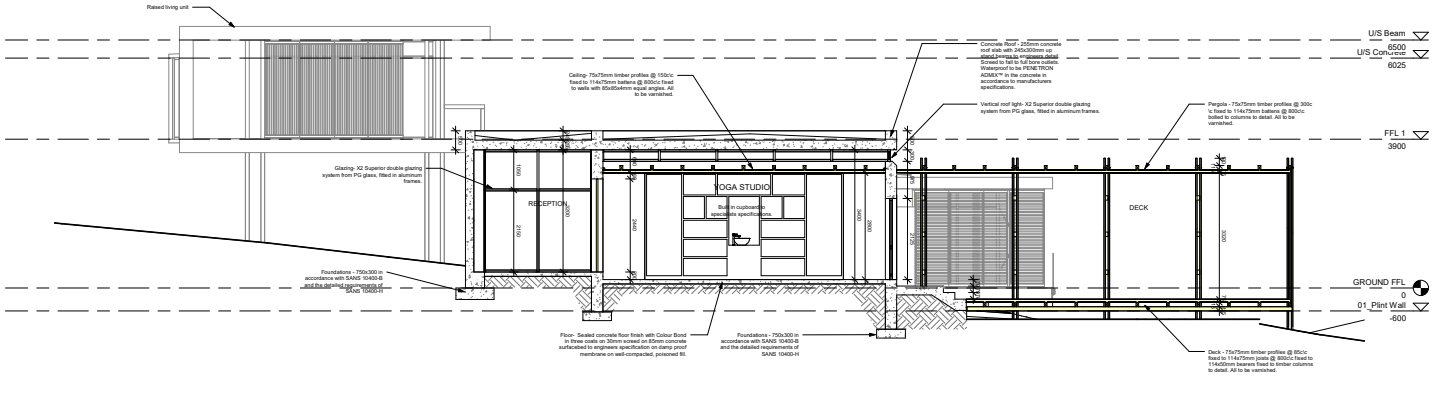
1 : 50



5 Section 6 - Callout 1
1 : 20



1 Section 7
1 : 50

NOTES

Coverage and FAR

Site	28.52ha
Ground floor	m²
Garage	m²
Total Ground Floor	m²
First floor	m²
Total First Floor	m²
Total area	m²
Coverage (max 40%)	%
FAR (max 0.40)	0.00

Revisions

No	Description	Date	By
1	Client Approval	10 - 2019	PV

PROPOSED WATER ONLY FASTING CENTRE

Erf 1/2865
BAYSWATER,
BLOEMFONTEIN

Penny Vorster
Student

Student Signature

Date

Student No: 2013021544

Description

Sections and Details

Occupation Classification: H3

Scales : As Indicated

ARCH - A303

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