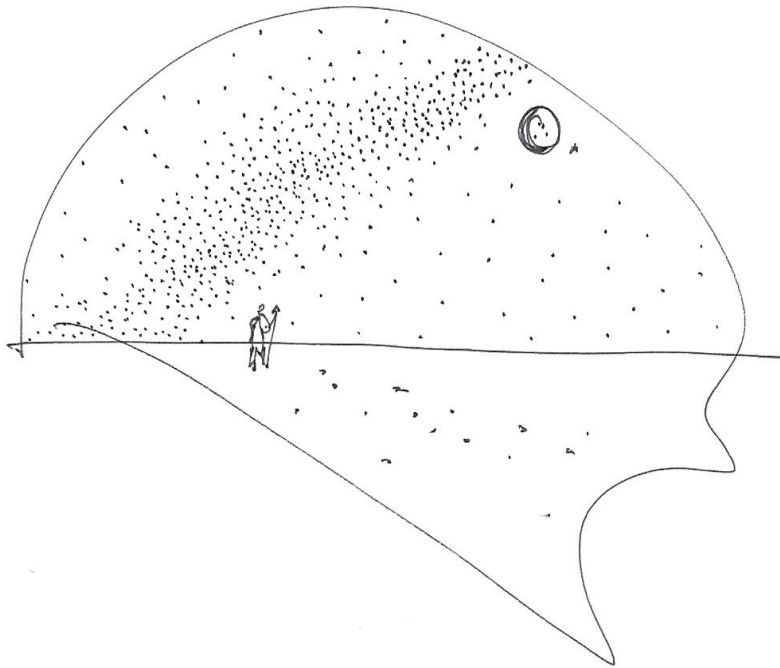


COVER

BACK OF COVER

READING ROOM LABEL

Fig.01. Mankinds relationship with the sky and sands



# RESIDUAL TERRITORY

*Genius of democratic public space*

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

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

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

*Ali Khalid Sadiq Sadiq*

# RESIDUAL TERRITORY

---

*Architecture in dramatic  
landscapes*

---

Volume 3 of 3.

Number: 06  
Street: Thindisa St.  
Town: Atteridgeville  
City: Pretoria  
Province: Gauteng  
Country: South Africa  
Client: University of Pretoria  
Program: Planetarium and Park  
Research Field: HSU | HCL  
Co-ordinates: 25°46'04.7"S  
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Submitted in partial fulfilment of the requirements for the degree  
MArch(Prof)

Faculty of Engineering, Built Environment and Information  
Technology.

Department of Architecture,  
University of Pretoria (UP).

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YEAR : 2016



UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA



# ACKNOWLEDGEMENTS

---

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

---

A sincere thank you to everyone who helped motivate, encourage and guide me through the course of the year. It has been astonishing to see everyone's assistance to make easy the personal journey of growth that 2016 was for me.

To my parents who have continuously supported me through the journey, watching intently from a distance. Your teachings, words of encouragement and love will resonate in the field that I now Master.

To my siblings, Roua and Hendrik, thank you for always helping me back to my feet and teaching me to concentrate my efforts through moments of doubt.

To my mentor, Mathebe Aphane, your dedication to the scheme was nothing less than inspirational, you have set me off on my journey with conviction that Architecture can contribute.

Finally to Boukunde, and the staff of the Department of Architecture 2011-2016, Thank you for allowing me to discover the answers to my questions, especially Dr. Barker for challenging the way we create Architecture in the South African context.

To Mpho Petlele, Johan Swart. and Johan N. Prinsloo, Your guidance goes beyond the masters year, thank you for always welcoming a conversation.

# MANIFESTO

---

## *The 'archs'*

---

*These two archs - architecture and archaeology - are Janus-headed, not identical twins but very much related. Both have to do with matter, space, time. But while architecture looks to projecting into the future, archaeology searches for the face of mankind in the past. Like Walter Benjamin's angel of history, archaeology is condemned to look into the past; architecture is the angel who builds jetties into the future. And the architect knows that the sands of time will eventually destroy the monument, whose only hope of resurrection will be through the knowledge and the tenacity of the archaeologist.*

*(Baker, 2002:37)*

# PREFACE

---

## *Building and drawing*

---

The significance of drawing -

In his book *Experiencing Architecture*, Rasmussen (1964) describes the process of drawing as the architect's collection of personal documentation - a visual diary to the insight of the architect's mind. The diagram can then be seen as the language of the architect. (Delaporte, 2016). Not constrained to any dimension or scale, the diagram originates as the core of an idea. Manipulated and refined, the diagram could become anything he chooses: an arbitrary section, a single point perspective or even a detail.

The function of the Building -

The selection of an appropriate programme as described by Barnard Tschumi (2004) in an interview with the *Architectural review*, makes the designer aware of two fundamental assets: firstly, the ability to define the margins of society and secondly identifying the events which contribute to the shaping of current times. To the Department of Architecture at the University of Pretoria, I am fortunate to have been made aware of these assets through the constant interrogation of building programmes. I am grateful to the process which has enabled me to read the landscape in which I exist - my reading of the skies and sands.

October 2016

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# ABSTRACT

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# ABSTRACT

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## *Spirit of place*

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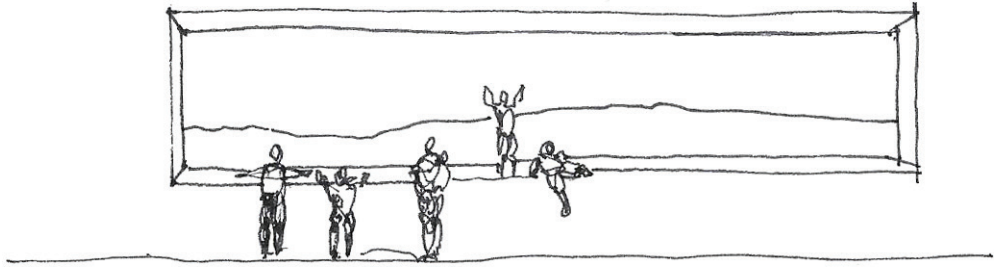
Traditionally, the essence and spirit of place dictated its use. Harmoniously intertwined, physical and mythical attributes were looked to in order to preserve the spirit of place (Genius loci). Today, such a place is the Atteridgeville fresh water reservoirs. Providing an opportune site to **reclaim the spirit of place** for the contemporary resident.

Understanding that the shack typology is not of place but of circumstances - this dissertation searches for an architecture of place in the scene of a democratic South Africa.

This study focuses on the provision of cultural, public spaces, based on an approach that recognises established townships as aspiring suburbs rather than dormitory towns.

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# 01

## INTRODUCTION

---

*The fade of the public sphere in township cores*

---

Volume I identifies the typical architectural response to township conditions as the 'multi-purpose hall'. To challenge this notion and demonstrate that a new approach could inspire successful space for social cohesion, this study investigates a site identified as a borderland to test this hypothesis. The investigation begins with the greater Atteridgeville as a means to develop an appropriate response.

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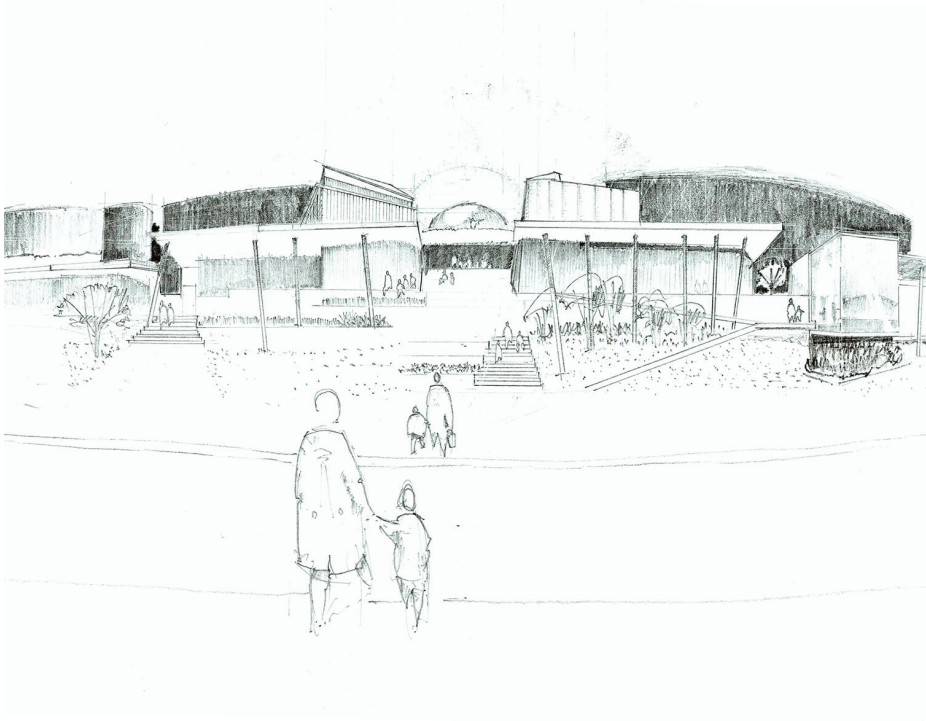


Fig.02. In search of a new typology. Untrue to the intentions of this dissertation, the June design was reconsidered to address the shortcomings of the architectural language.

## AGAINST ROMANTICISED POVERTY

Understanding that the shack typology is not of place but of circumstances - the dissertation searches for an Architecture of place in the scene of a democratic South Africa.

## 1.1 PROBLEM STATEMENT

### *Negotiating the RDP*

*The Tshwane Vision 2055* highlights that as a part of the *2012 National Development Plan*, action will be taken to reverse the spatial effects of apartheid (City of Tshwane, 2013:26). However, with the predominant efforts of the *Reconstruction and Development Program* (RDP) aimed at low density housing located on the periphery of the city, the spatial legacy of apartheid is still felt within the monotonous

townships. Post-apartheid South African town planning strategies undermine the importance of diversity of typology and land use. As these mono-functional dormitory towns develop economically, they transform into suburbs, refer to volume I. With no civic amenities or public destinations to cater to the needs of the contemporary citizen, residents are forced to retreat within their private abodes.

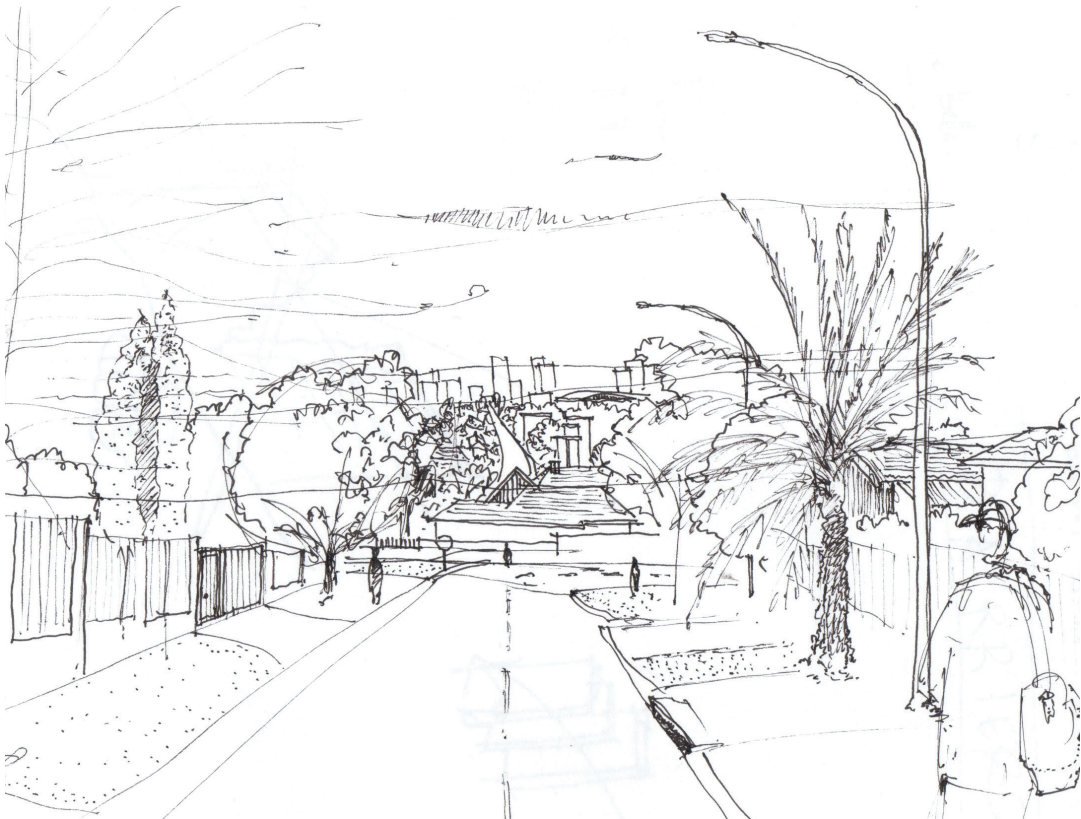


Fig.03. View eastward on Thindisa Street towards Pretoria CBD. The suburban condition.

## 1.2 GENERAL ISSUE

### *Incoherent environments*

Cities rely on a complex interaction between a series of parts to function coherently. Urban environments provide a diversity of scales and layers to accommodate the activities of the user.

Despite displaying higher densities than their white counterpart suburbs, South African townships remain crippled by the spatial legacy of apartheid. The exclusion of amenities and focus on NE51/9 housing has created a monotonous typology which defines the sleeping town identity of townships surrounding Pretoria and throughout South Africa. As a consequence of the said planning, public space has lost its value within South African townships (Jordaan, 1989: 26).

As shown in Figure 04, a block study in Atteridgeville reveals how the (green) public space is absorbed by the need to develop new homes closer to Pretoria.

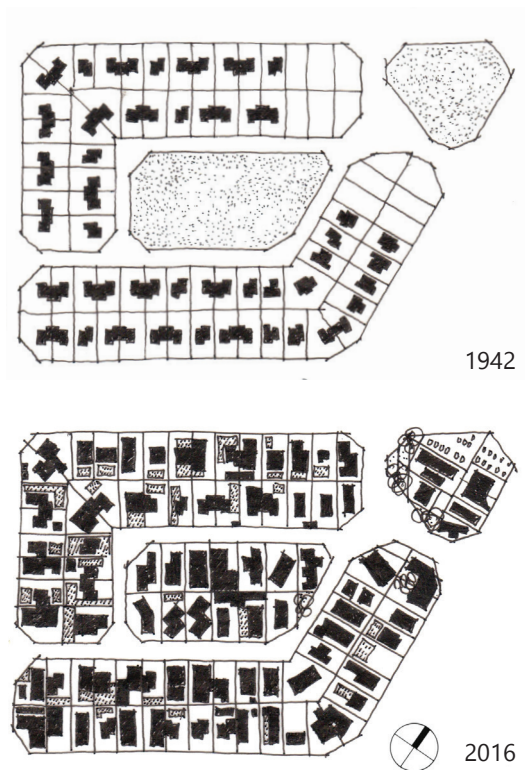


Fig.04. Block Study Nel & Sadiq 2016. Densification and disappearance of open space adapted from Stals (1998;80.)

## 1.3 URBAN ISSUE

### *The need for a civic destination*

The proposed investigation is derived from the identified lack of civic spaces in townships surrounding Pretoria. With extreme pressure placed on government to meet the housing demand, town planning strategies have placed civic spaces secondary to housing. Originally conceived as an experimental black-labour township, Atteridgeville's current urban fabric resembles that of a suburb, however, the combination of the topography and the adopted Garden City model have resulted in a tranquil setting for the sleeping town. Public space is constantly lost, as neighbourhood parks are being sacrificed to accommodate new housing (see Figure 04).

In a post-colonial era, municipalities have invited the private sector to develop housing. These developments are saturated with small units inspired by the NE51/9 house and provide no supporting open space. This perpetuates the lack of complexity and diversity of architectural typology within the fabric resulting in a region of low density, stand-alone-units with no amenities situated on the periphery of the city. As the need for a civic destination is not met by current RDPs, the apartheid legacy resonates in current day township development. These locations can no longer be treated as disconnected suburbs but rather as developing urban environments with city-like qualities (Dewar & Utyenbogaardt, 1991:18).

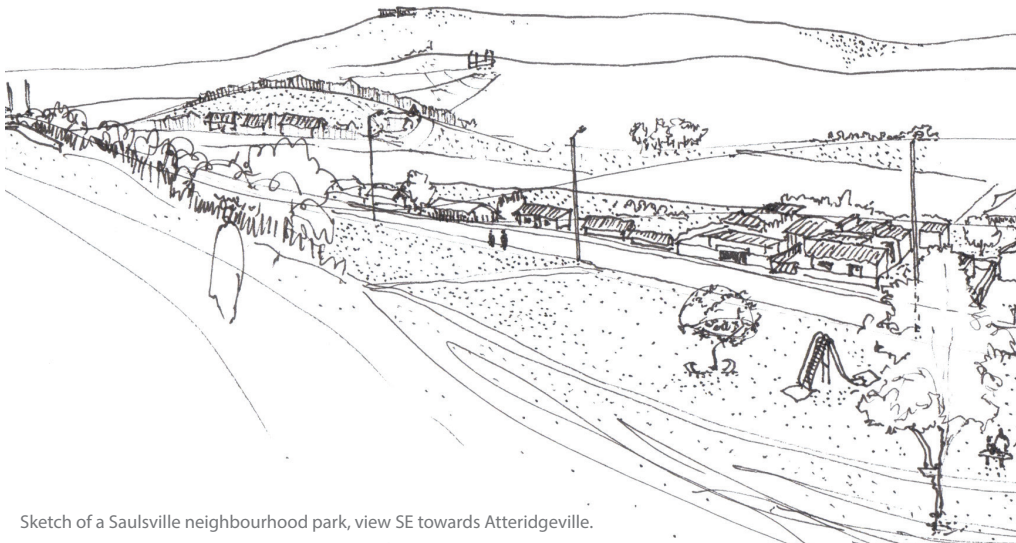


Fig.05. Sketch of a Saulsville neighbourhood park, view SE towards Atteridgeville.

## 1.4 DISSERTATION INTENTIONS

*Against romanticised poverty*



Fig.06. An inspiring institute for the contemporary citizen

The aim of this proposal is to address the conditions described and highlight the possibilities of developing townships to become self-sustaining towns. This exploration attempts to create a space of civic pride and dignity manifested through the innate properties of architecture and to promote safety and diversity in the public sphere. Doshi in Ramachandran's documentary (2009) suggests that an architecture that is celebrated by the activities of the everyday develops into

an inspiring institute, one which has the ability to emancipate the contemporary dweller.

This approach comes as a response to the current way of thinking about public buildings in South African townships. Implementing a school of thought where the product of space making is derived from the spirit of place and enhance the social condition rather than exasperate it.

## 1.5 RESEARCH DISCUSSION

### *Architecture and the working class*

Historically, architecture has played a significant civic role in the urban fabric. Public buildings were commissioned by affluent and prominent figures, yet these buildings accommodated the working class citizen. Public spaces were celebrated while the conditions of the user were considered without being patronising.

A more recent example of this notion is the Madrid Atocha Station. This structure shows great consideration for the everyday activity despite being a transport interchange. In the last few decades, the museum has provided the necessary leisure and escape from the mundane for the working class.

In the new millennium however, the idea of public space has morphed into a conglomerate of commerce - the shopping mall. Today, South African town planners indiscriminately allow the erection of these occidental examples of privately owned public space.

The problem however, is that these private centres attract consortium which compete with the local small-business owner. In addition to the disruption of micro-economies, these occidental models have a profound impact on the value of the true public sphere and the ability of architecture to contribute to the everyday.

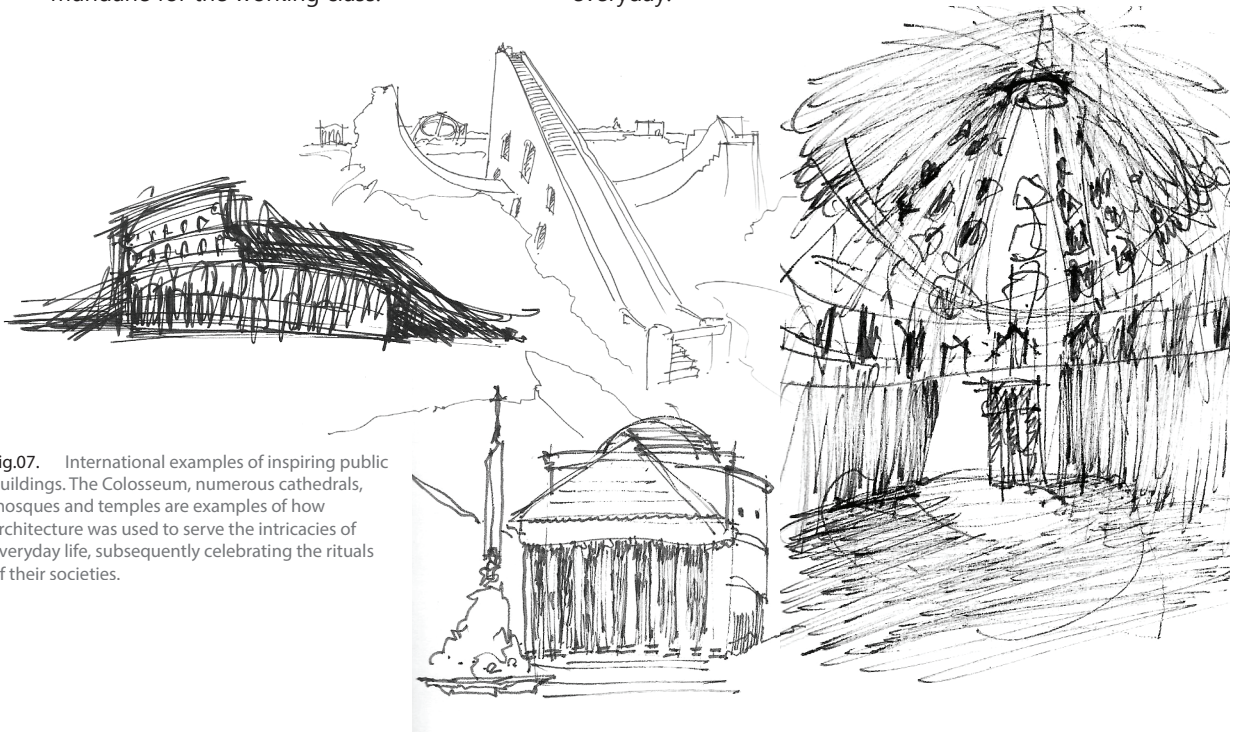


Fig.07. International examples of inspiring public buildings. The Colosseum, numerous cathedrals, mosques and temples are examples of how architecture was used to serve the intricacies of everyday life, subsequently celebrating the rituals of their societies.

---

## 1.6 RESEARCH METHODOLOGY

---

*First, second, third place. [Ray Oldenburg]*

---



Fig.08. View towards Pretoria CBD, eastwards on Mabothe Street. Tranquil residential neighbourhoods make up the fabric of Atteridgeville.

The study begins with Part I, investigating the spatial legacy of Atteridgeville. The events prior to democracy are examined to identify the ideological remnants of the spatial legacy of apartheid.

A transect walk through the town aids in confirming or denouncing the prejudices of the studies, providing a thorough investigation leading to the first objective, *the mapping exercise*.

The second objective deduces an urban strategy for approaching Atteridgeville as a totality. This strategy will manifest as an *Urban Vision*, in which the programme and architecture can be situated, and tested against.

The third objective is the development and iteration of the conceptual explorations into contextual form. This process is highlighted in order to make the designer cognisant of the implications of an imported model, asking the question

*“What is a **mall** in Atteridgeville?”.*

This final objective aims to produce an architecture of the *“third place”* - a place on the corner (Oldenburg, 1989). This programme will manifest as a derivative of the needs of a post-colonial South African township.

## 1.7 DELIMITATIONS

### *Asymptotic suburbia*



*Like an island emerging out of suburbia, the site of Atteridgeville's water reservoir dominates the ridge as if placed on a podium. The process of reclaiming this leftover green-space attempts to integrate this peripheral site back into the urban fabric.*



This dissertation focuses on the provision of cultural public spaces, based on an approach that recognises established townships as aspiring suburbs rather than dormitory towns.

Supported by the Urban Vision, which identifies twenty-one sites of possible intervention (refer to Volume I), the selected site aims to create an anchor for the social character and living heritage of Atteridgeville.



Fig.09. Oudstad no. 21: The site of the Atteridgeville Water Reservoir is identified as a *Green Island*

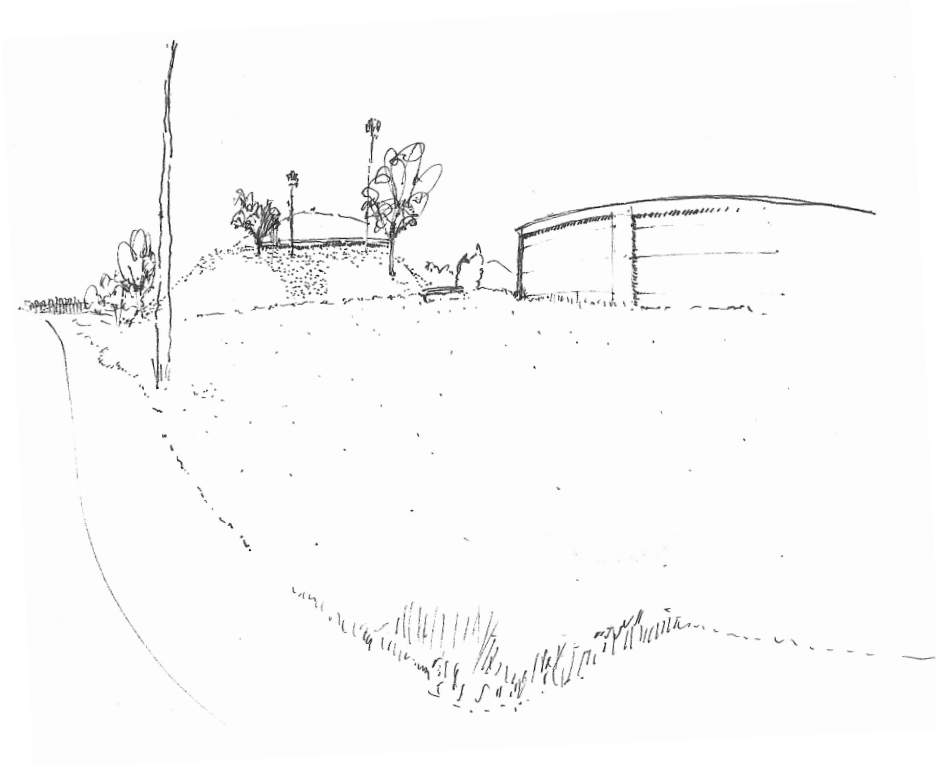


Fig.10. Discovery. First engagement with the water reservoirs. Author, site visit 2016.

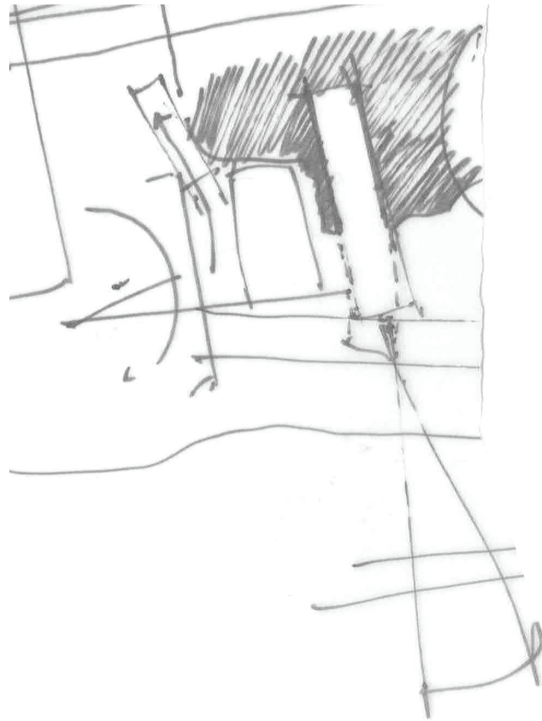


Fig.11. Levels. Attempting to understand the three dimensional in-between space. Author, 2016.

## PERMEABILITY OF THE FENCE

---

*Author's notes*

---

Expression in building still holds value in Atteridgeville. Building materials are used to exemplify status and highlight identity, and where possible, they permit connection to the street. Boundary walls are not used as defence mechanisms, but rather function as an ornament. Gates too are decorative, as they remain open throughout the day allowing the garage to form a semi-public living room, while the car is parked on the sidewalk.

These thresholds and the progression through space are demarcated architecturally, and universally understood in Atteridgeville. A natural flow is carved from the public realm to the intimate private space.

# INVERSION OF THE SECURITY SUBURB

---

## *Author's notes*

---

By responding to these conditions, the intention is to challenge the status quo of modern township developments, the dissertation aims to explore the possibility of reinvigorating the public/social realm.

Creating an enticing public anchor that draws people against the current, i.e. out from the isolation of suburbia and back into the public sphere. This is done to prevent the development of the security suburb model discussed in Volume I.

The provision of civic space of leisure aims to highlight the extraordinary in the mundane and invite daily activity.

Like the security suburb, recent large scale developments have provided exclusive public space centred around commerce. With the exception of window shopping, Atlyn Mall provides no other free of charge service.

# 02 CONTEXT

---

## *Accessing the peripherals*

---

Having identified the site as a peripheral lot in terms of its elevation, this chapter aims to explain the conditions of the site in it's context.

---



## DIVULGE

*Scribing the story of place*

Fig.12. The tight knit fabric of Atteridgeville. Showing a combination of an affluent neighbourhood, a cluster of NE-51/6 homes and the Atteridgeville cemetery.

## 2.1 LOCALITY

### *External influences and internal conditions*

Located in the western most portion of the city, Atteridgeville is Pretoria's first black-labour township. Approximately 14km west of Church Square, the overpopulated suburb is directly connected to the city centre via W.F. Nkomo Street (previously Church Street). Alternatively, three train stations provide a link to the city for residents in Atteridgeville who do not have access to private vehicles or taxis (illustrated in the quantitative analysis in Volume I.)

In the broader context and in terms of location, Atteridgeville is a part of the North-South urban Development Corridor, (MCDC) aimed at connecting Pretoria's northern most settlement, Mabopane, to the southern most settlement, Centurion. Approaching from the east, Atteridgeville is the termination point of a string of formal settlements latching on to

the N4 road within the confines of Tshwane. On an urban scale, these conditions provide for interesting opportunities that can aid in connecting Atteridgeville back to the city in a east west direction. Additionally, cultural destinations can reinforce the *Mabopane to Centurion Development Corridor* in the north south direction.

The Garden City radial plan of Atteridgeville converges at the administrative heart of the township where the Police Station, Magistrates Court, Stadium, Town Hall and Municipal offices are located. These high streets provide energy and activity throughout Atteridgeville, taking advantage of high density, foot traffic and passive surveillance. These high streets are especially animated on weekends or after working hours due to work migrations.

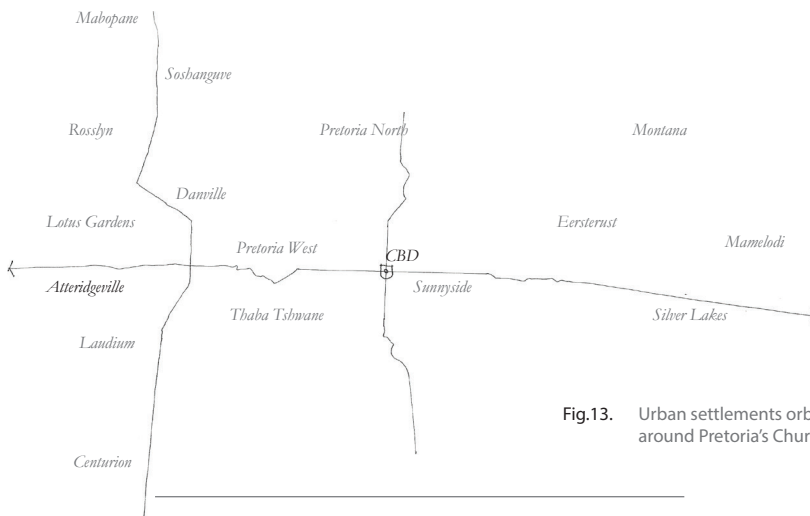


Fig.13. Urban settlements orbiting around Pretoria's Church Square.



## 2.2 NATURAL FEATURES

### *Overcoming physical barriers*

The incorporation of natural features into the urban zoning strategies under the apartheid regime meant that rivers, mountain ranges and other prominent topographical features could be used as buffer zones (Stals, 1998:15). Turok's (1993:4) illustration below shows how these natural features were used to separate white and non-white urban settlements.

Ouzman (2009) proposes that the essence of public space in a South African context relies heavily on the spirit of place. Ouzman expands on the value of natural features as assets of the community, highlighting that ordinary life and extraordinary rituals were exercised in the dramatic South African landscapes between the sky and earth.

Atteridgeville's conception relied on these natural features to create a separation between Pretoria's

white central business district and the black labour town (refer to Volume I for Atteridgeville's history).

The dawn of democracy creates an opportunity to reclaim our natural assets and integrate them into South Africa's Post-colonial culture-scape.

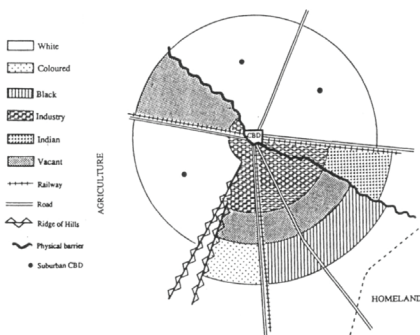


Fig.14. Crude Urban Zoning, the Apartheid City way (Turok,1993:4)

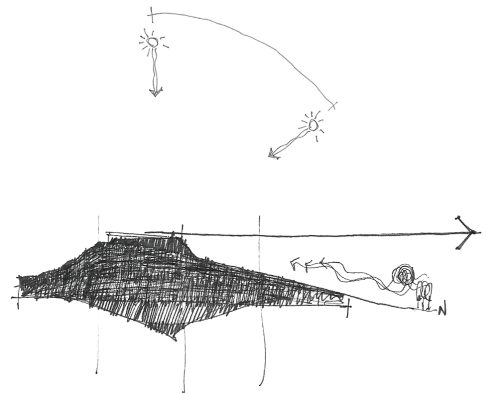


Fig.15. Approach to Natural Features. Urban Balcony. May,2016.

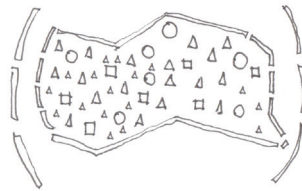
## 2.3 URBAN CONDITION

### *Dependency and Sprawl*



**Fig.16.** Current condition:  
Monotonous residential  
environments spread across the  
landscape (Nel & Sadiq, 20016).

**Fig.17.** Proposed condition:  
Diversify the urban fabric and  
create social anchors to contain  
lost energy (Nel & Sadiq, 2016).



Dependency on employment in urban cores means that the working class often leave their homes early in the morning and return in the late afternoons. Due to this work exodus, the residents who remain in the suburbs on the periphery of Pretoria, are those with no disposable income.

With an urban fabric unable to support this influx, and fuelled by the lack of diversity of activities, the conditions of these marginal suburbs are perpetuated as working class residences are obliged to return to urban cores for entertainment or evening activities.

Youth unemployment is prevalent in these residential suburbs due to the lack of opportunity, and neglected zoning for industrial or commercial centres. Home businesses and entrepreneurship are the predominant means of self-support and often require large capital expenditure, coupled with high risk investments.

The studies conducted in Volume I attempt to understand the influence of the apartheid spatial planning on democratic South African suburbs in order to propose a method for appropriate intervention.

## 2.4 URBAN VISION

*Developing a response for the Apartheid  
Spatial Legacy*

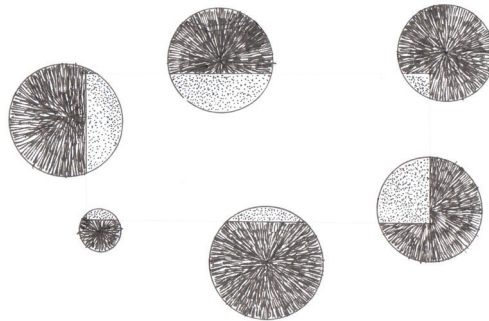


Fig.18. Conceptual Methodology: Activity to define boundary. Psychological city walls (Nel & Sadiq, 2016).

Volume I identifies the character of monotonous suburbia within the confines of Atteridgeville. In order to remedy this situation, twenty one sites are identified and discussed as possible sites of intervention to diversify the fabric of Atteridgeville.

1. Connect :  
To other civic nodes
2. Interface:  
To the street and immediate surrounding
3. Activate:  
Draw energy back into the public realm

These interventions vary in scale and function and can be explored further in Volume I of the research. The overarching principles that guides the diversification process of the urban fabric can be dissected into the following:

## 2.5 OUDSTAD No. 21

### *Infrastructure predominates*

Site twenty one was selected from the list of sites discussed in Volume I due to the dramatic natural setting and internal forces that give this site its unique character.

Its elevation makes it the highest point in its surroundings. At 1480m above mean sea level, the site is completely visible from all corners and valleys of Atteridgeville and beyond. Vistas are provided back towards Pretoria CBD [East], the Quagga Mountain range [South], Lucas Moripe Stadium and larger Atteridgeville suburbia [West], finally Lotus Gardens across the N4 road [North].

Due to its elevation and lack of access, the site has become a peripheral lot in the third dimension. In conjunction with this island effect, the boundary fence further separates the site from the urban fabric, which prevents opportunities for thoroughfares.

Situated at the physical summit of Atteridgeville, the site is home to a discontinued and submerged four mega-litre reservoir, two eight mega-litre tanks located above ground and a twenty mega-litre semi-submerged fresh water reservoir which supply water to Atteridgeville and Saulsville residences.

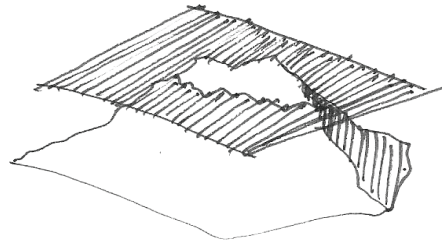


Fig.19. Abstraction of the island effect

These reservoirs dominate the site and the south-east skyline of Atteridgeville. The platonic cylinders protrude from the natural ridge creating a contrast, not only between the natural and man-made, but between the privately owned residential typologies and the overpowering municipal infrastructure.

The surrounding homes form part of an affluent neighbourhood, nestled between them, west of the site a Mosque and a Zion Christian Church meet one another on Thindisa Street.

The commercial hub, Atlyn Mall - is situated four-hundred meters to the east, and towards the south Atteridgeville Cemetery fronts the neighbourhood at the base of the hill (Figure 21).

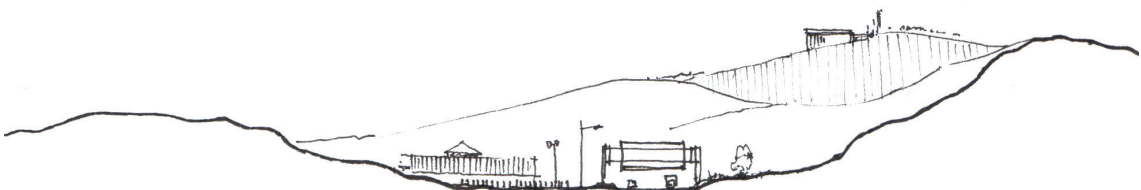


Fig.20. Section through Maunde Street. Illustrating the peaks of the Quagga Mountains. Laudium Water Reservoir can be seen in elevation.

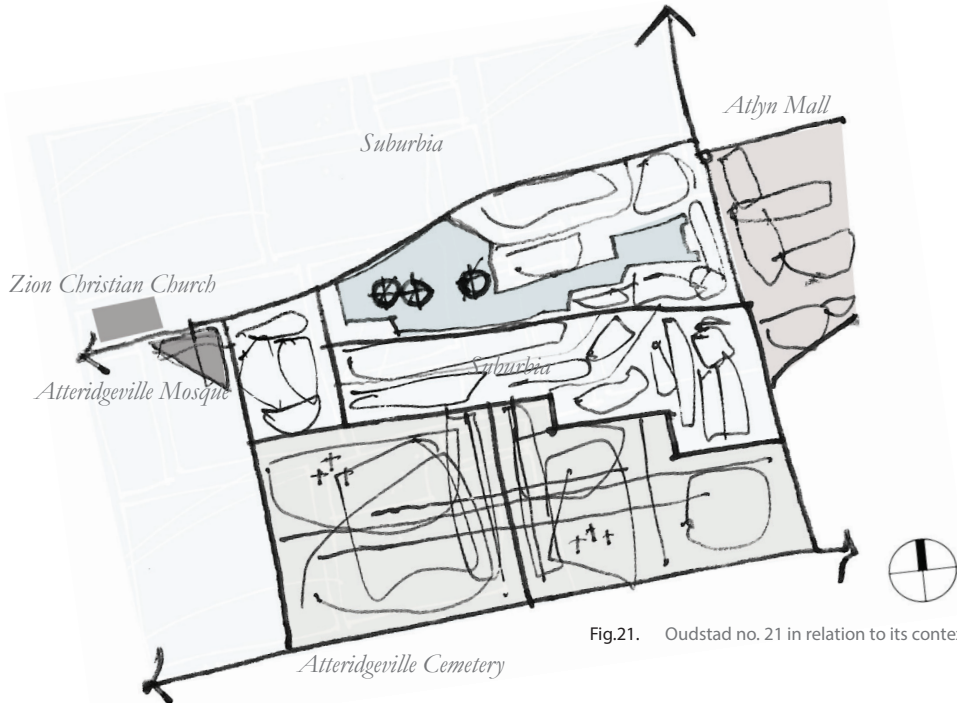


Fig.21. Oudstad no. 21 in relation to its context NTS.

Integral to the planning of Atteridgeville, provision for private vehicular access to individual homes has created leftover space. Due to inaccessibility this abandoned space creates a tail-piece that meanders behind the homes on the peak of the ridge (Figure 21). This linear green strip provides an opportunity to reinvigorate the area, making it possible for homes that once faced a neglected planning error to face a reclaimed green space.

From Atteridgeville's southern entrance, via Maundestreet, the largest of the three reservoirs can be seen floating above a sea of tile-roofed homes. These scattered infrastructural elements can be found along the skyline (Figure 22), drawing attention to high-voltage electrical carriers, telecommunications towers, water reservoirs and double-lane vehicular roads - all seen westbound on Maunde street.

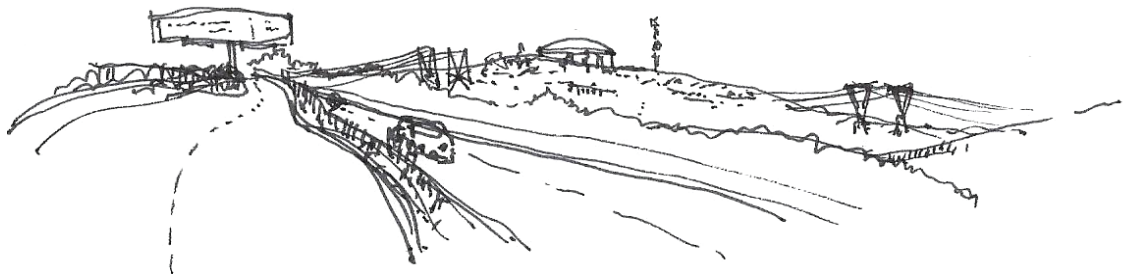


Fig.22. Sketch of approach to site, highlighting the domination of municipal infrastructure on the surrounding landscape.

## 2.6 OUDSTAD No. 21

### *Infrastructure predominates*

The demand for housing nearby Pretoria's CBD has forced residential lots to emerge in hostile environments within Atteridgeville's fabric. There is an opportunity to reclaim the spirit of place on the summit of this ridge while sensitising the overpowering municipal water reservoir site. Changing the way people view and access their environments.

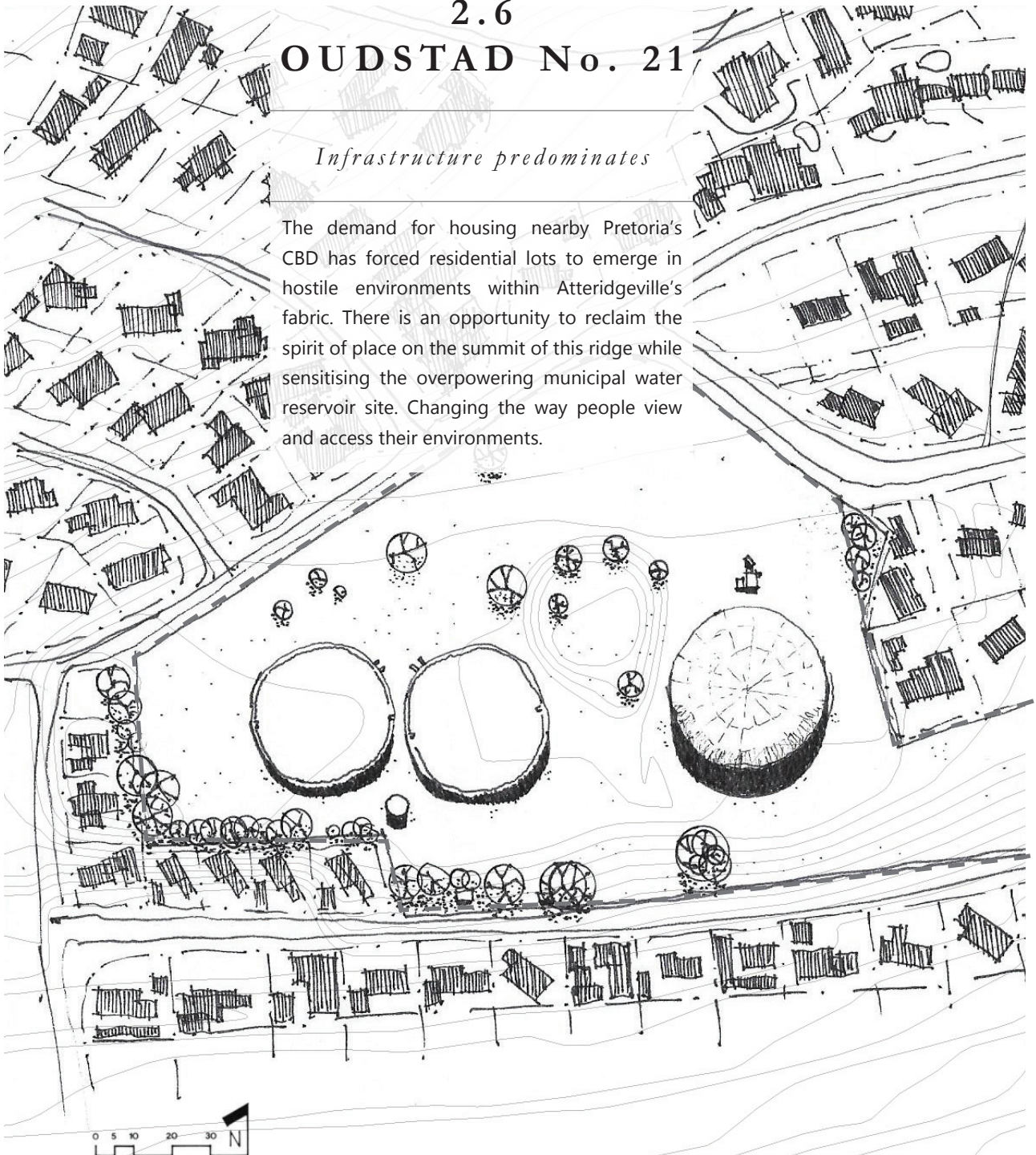




Fig.23. Site Plan of the Atteridgeville water reservoirs including the space left over after planning, creating a tail-piece stretching east.

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## 2.6.1 DEALING WITH BOUNDARIES

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### *Incoherent Environments*

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Fig.24. Isolated. October, 2016.

Isolated on the hilltop, the site is disconnected from its surroundings due to the suburban condition. With the exception of the service crew, access to the site is prohibited. The necessity for water provision has undermined the significance of the hill, disconnecting the resident from appreciating a prominent feature in their local environment.



Fig.25. Inverted. October, 2016.

Seeing this as an opportunity, the site welcomes the daily user, attracting the residents of the suburb to visit the park. Inverting the current model of privatisation, the site aims to draw attention to Atteridgeville from the larger Tshwane region. Connecting this space with a larger green network challenges current township developments which exasperates the condition of suburbia.



## 2.6.2 CREATING PATTERNS

### *Palimpsest*

The points of energy on site include directed views, activity nodes around the water tanks and a central space of collection. On the south, after the bottleneck, the site reveals a view over Atteridgeville. These energy nodes can be used to determine the sequencing of spaces, allowing the natural movement on site to determine the unfolding of programme.

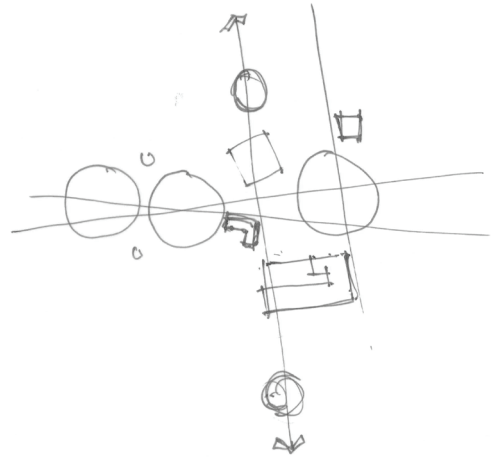


Fig.27. Energy axis. July, 2016.

For the daily user and the passer-by, the main movement route is identified as a diagonal line that intercepts the main gathering space. This provides an opportunity to engage with friends or bump into a relative, and spark a conversation. For the visitor, this glimpse into the sense of community present in Atteridgeville aids in changing perceptions about the stigma associated with townships.

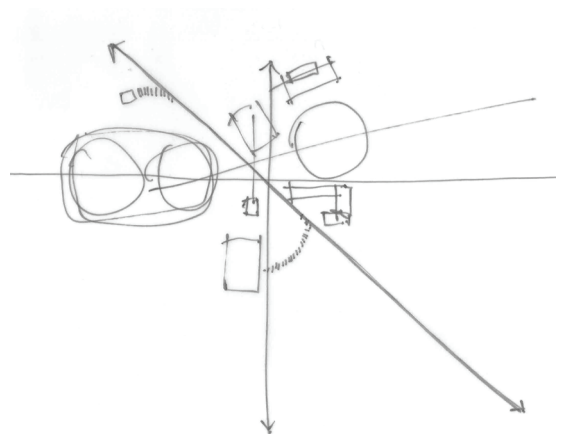


Fig.26. Movement axis. July, 2016.

## 2.6.3 3<sup>RD</sup> NATURE

### *Ecological significance of the ridge*

The site, measuring 1.8 hectares, is situated on a plateau of the Quagga Ridge. With the addition of the water reservoirs, much of the site was altered and flattened for ease of maintenance. The ecological integrity and value of the site has been disturbed as trees were planted to conceal the gigantic reservoirs.

To prevent further deterioration of the natural ecology, it is proposed that a master plan be devised for the landscape to successfully treat and preserve the ecological integrity of the ridge. The artistry of landscape architecture according to Dixon Hunt (1992:13) has the ability to remedy such a disturbed site.

A strategy for runoff water will be devised, including the design of terraces. The terraces will capture, retain and up-cycle runoff rainwater. Conceptually, these terraces also will act as the table-cloth for the activities happening on site.

This integration of function with the landscape design will predominantly focus on restoring the ecological significance of the ridge. Creating a podium that acts as an urban balcony - a place where local residents can meet in late afternoons to enjoy a current of cool air and reconnect with the environment as envisioned in Figure 15.



Fig.28. Glimpses of the neighbouring rooftops can be spotted from the peak of the site. Photograph looking NE from the roof of the submerged reservoir. March, 2016.

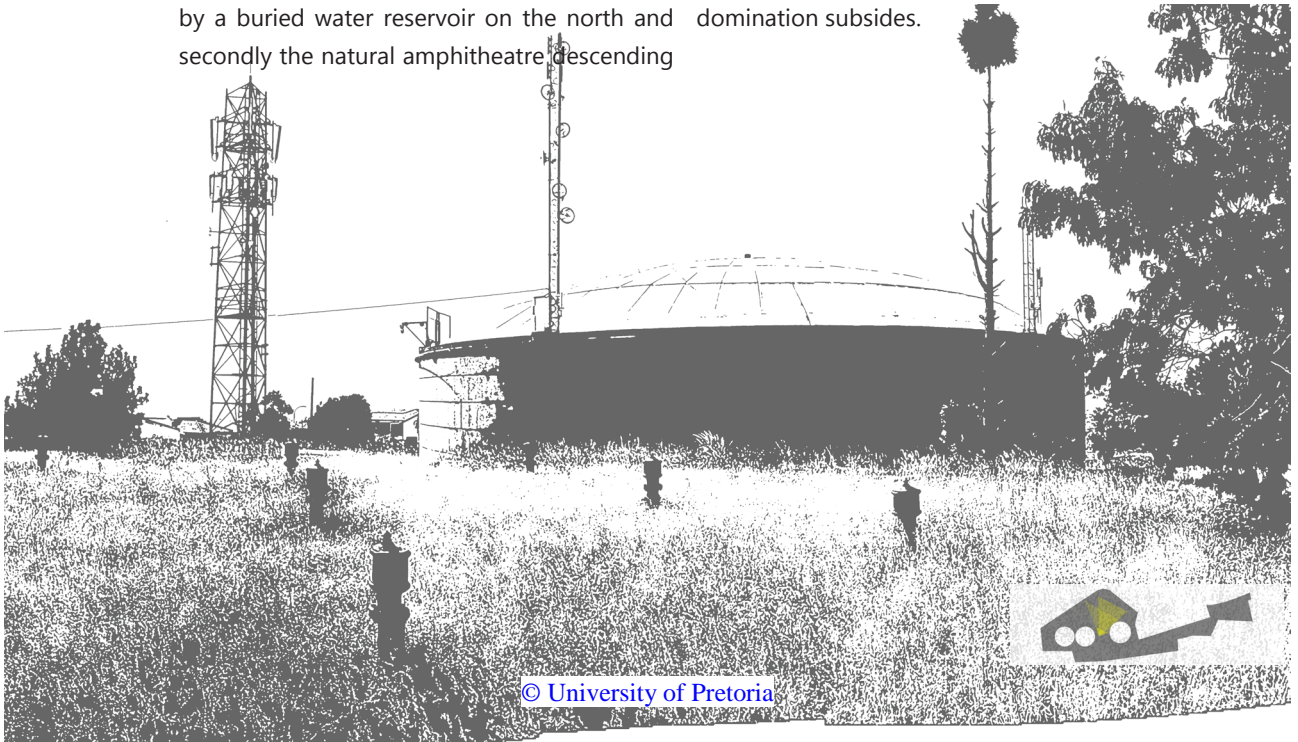
## 2.6.4 FORTUITY

*An instance of chance or occurrence*

The chosen site offers the curious visitor many opportunities and experiences. The undulating topography and swells of the distant mountains invite contemplation. This passage of time creates a fluid landscape, accentuated by dynamic shadows and orange skies at dusk and dawn. At 1480 meters above mean sea level and almost one hundred meters higher in elevation than its immediate surroundings, lies a spectacular mediation between the sky and ground. As clouds slowly move over the landscape, shadows they cast can be tracked as they glide over the topography.

The site can be distinguished by two immediately evident conditions: First: the podium created by a buried water reservoir on the north and secondly the natural amphitheatre descending

toward the south. Both conditions deliver views over Atteridgeville and beyond. While the sheltered southern-end calls for a more intimate resolution of programme, the north is less demanding and accommodates for larger gatherings. These qualities, in combination with the placement of the cylindrical giants, create a natural transition through space directed by the curves of the reservoirs. Approaching from the northern edge, the site bottlenecks between the *big friendly giants* accentuating their gravitas. However, the experience of approach from the south is completely different. Although this appears tiresome on plan, the steepness of the topography shifts the focus towards the physical action of ascending the hill, and the domination subsides.



## 2.6.5 DIVULGE

### *Revealing the story of place*

By studying the noli-map (Figure 23) the three platonic circles animate the context with their gigantic scale and deep shadows on the sloped topography. Their difference is only noticeable in elevation i.e. the way they are capped. The two reservoirs on the west have a flat concrete roof whilst the larger of the three situated on the east is domed.

With the exception of the largest of the three reservoirs, the site is hidden behind the foliage and the severe plateau created on the hill-top. This podium provides a tranquil, protected depression on the southern portion of the topography. This natural amphitheatre provides views across the undisturbed ridges of the Quagga mountain (Figure 20).

The reserved site stretches towards the east through the linear tail-piece. Obstructed by two residential lots, this tail-piece would otherwise make direct connection with Khoza Street, the high street linking W. F. Nkomo on the north and Maunde Street on the south. Establishing this connection will assist drawing energy from the adjacent shopping complex and active street. These movement routes and possibilities for newly formed connections are highlighted below in Figure 29, but discussed in detail in 2.7. These thoroughfares will act as receptions for the site, welcoming visitors as well as guiding the daily user and resident to take an alternative route home, refer to Part I for major transport nodes.

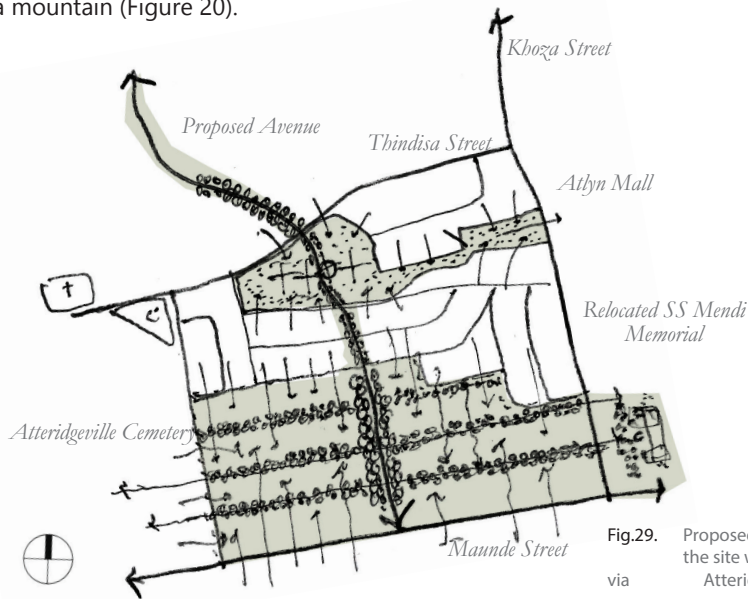


Fig.29. Proposed avenue to connect the site with Maunde Street via Atteridgeville Cemetery.

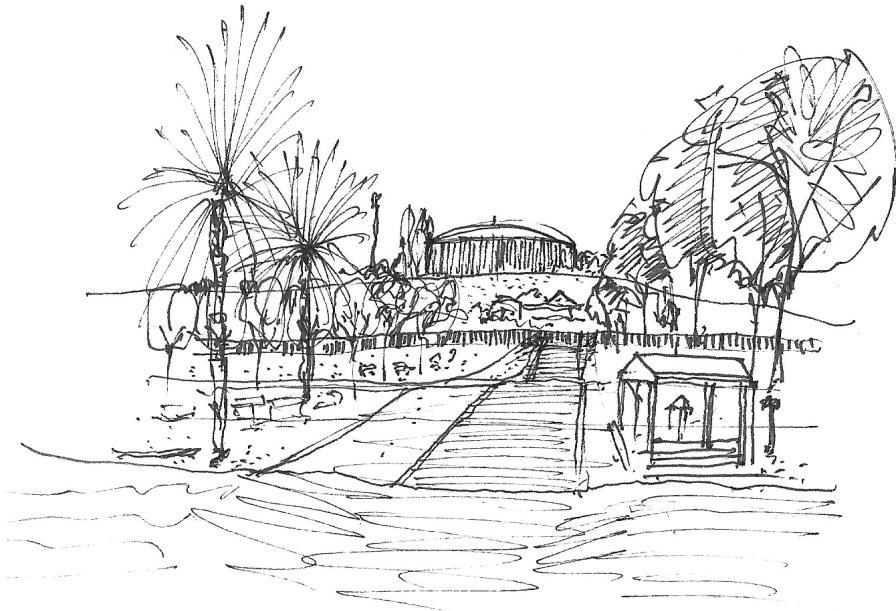


Fig.30. Approach from Atteridgeville Cemetery, south of the site. The 20MI tank dominates the surrounding scale.

The large vehicular artery, Maunde street provides the only point of entry to Atteridgeville from the south. With the cemetery lining Maunde street towards the northern edge, an opportunity exists to connect the cemetery with site 21, as a series of green public spaces that encourage outdoor civic activities (Volume I - urban vision).

As discussed in Volume I, Atteridgeville Cemetery provides an opportune moment to reclaim the lost green spaces that once populated the township. This is predominantly due to its location in the urban fabric and lack of space for new burials. Reintroducing the cemetery as a green space will require a change in perception of burial sites once they are full. The cemetery is currently underutilised with the exception of a few repeat visitors.

The first intervention will be in the form of establishing a southern entrance to site 21 (see Figure 29 and 30). This thoroughfare will allow residents who rely on public transport to descend the hill-top through a newly created 'short-cut'. This new activity will become a catalyst for residents to review how they make use of mono-functional municipal spaces.

This mono-functionality can be noticed in both the cemetery and water reservoir site. In the case of the water reservoirs, the removal of the boundary fence will aid in creating curiosity on the site as a point of surveillance. With time, the site will be infiltrated with activity, appropriated by the immediate residents, school children and passers-by. These proposals do however raise concerns with regard to health and safety as the public will have access to the suburb's fresh water supply.

## 2.7 FRAMEWORK *Layering the site*

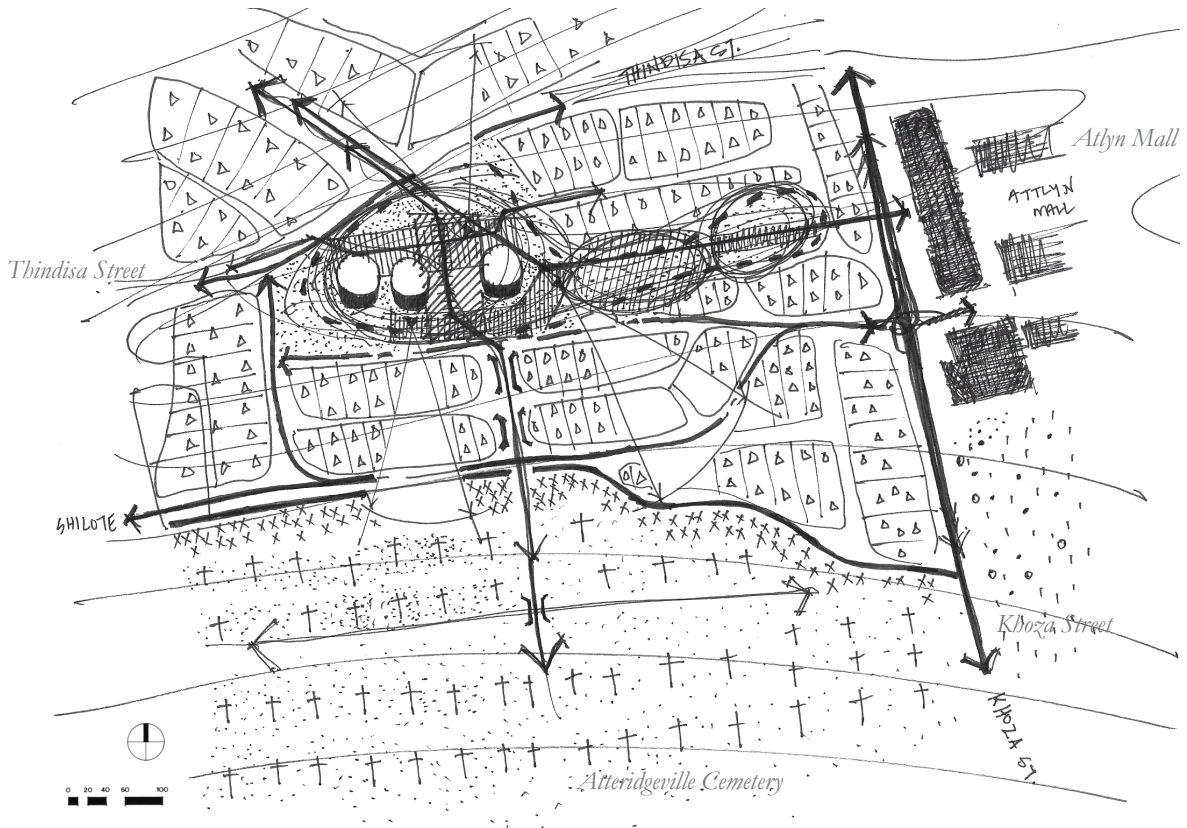
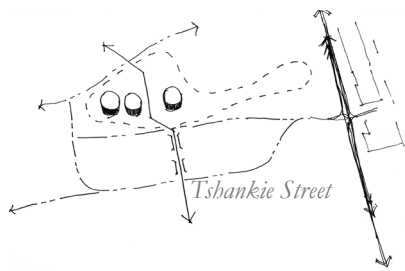


Fig.31. Establishing connections to the surrounding context. Inviting 'the everyday'. April, 2016.

### *The everyday*

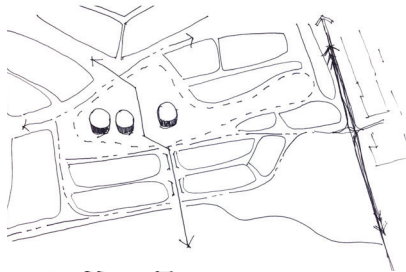
*“There are two versions of the everyday that exist today, though the two seem contradictory. In one, the everyday is understood as an aesthetic experience tied to democratic values. In the other, the everyday becomes a signifier for the identity of a powerful class.”*

*(Halley, 1997:191)*



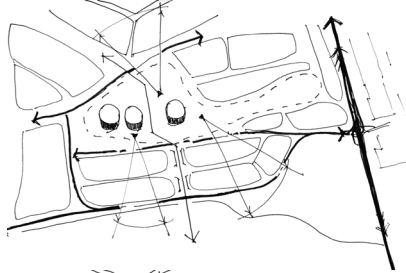
**A** » *Establishing a connection to Atteridgeville Cemetery*

As discussed previously, the success of these thoroughfares is dependent on the energy provided by the daily user. Establishing north-south access to Maunde street will activate the cemetery and draw energy through the site. Challenges include negotiating the topography, and the extension of Tshankie Street which entails the relocation of four family homes.



**B** » *Inviting surrounding context to infiltrate the site*

This is not exclusive to the homes and retail activities in the immediate context, but rather focuses on providing safety and ease of mobility across the site without jeopardising the quality of water housed on site by ensuring that the new activities do not affect the maintenance of the reservoirs and location of servitudes.



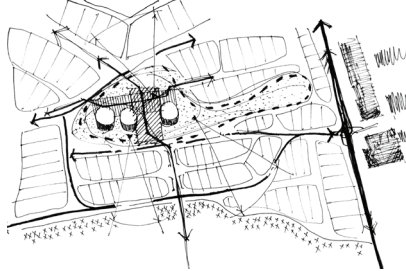
**C** » *Defining platforms for viewing. Highlighting the genius loci*

The site has marvellous lookout points which include the topics inspired in Chapter 2. These lookout points will attract different users dependant on the time of day, weather and nature of the view point. This creates an additional layer that the site offers to the user, providing opportunities to respond programmatically.



**D** » *Defining a programme to anchor the site in its context*

Generating a programme fit for the site and context involves examining a broader study of the region. As determined by volume I, Atteridgeville displays a unique attitude to the nature of public facilities in townships. Cross-pollination of programmes and public interaction are major influences on the choice of programmes.



**E** » *Activating edges to contain activity on site*

The manageability of a 1.8 hectare site in such a tight-knit fabric such as Atteridgeville is dependant on the success of its linkages with its surroundings, and interaction with neighbouring residences. Ownership and infiltration of local activities must be harnessed and encouraged.

Fig.32. Activating the site. Exploration. April, 2016

## 2.8 INFERENCES

*Understanding context to forecast development*

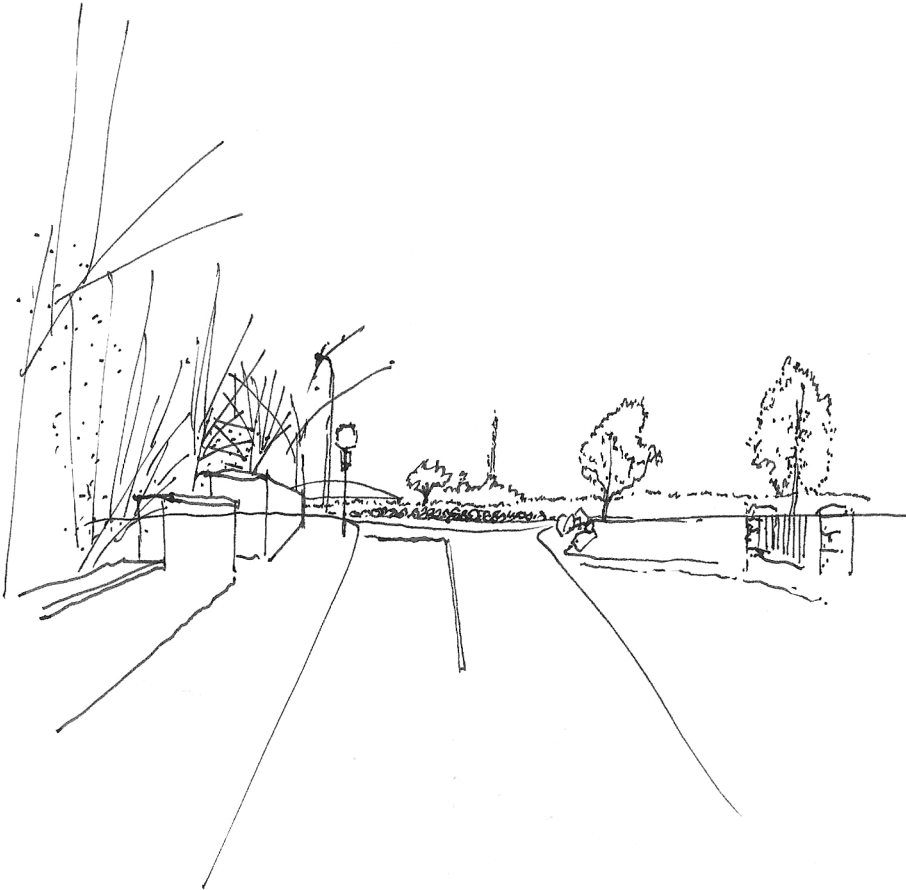


Fig.33. Approach from Tlale Street. With the exception of the domed concrete roof, the tanks are hidden behind the topography.



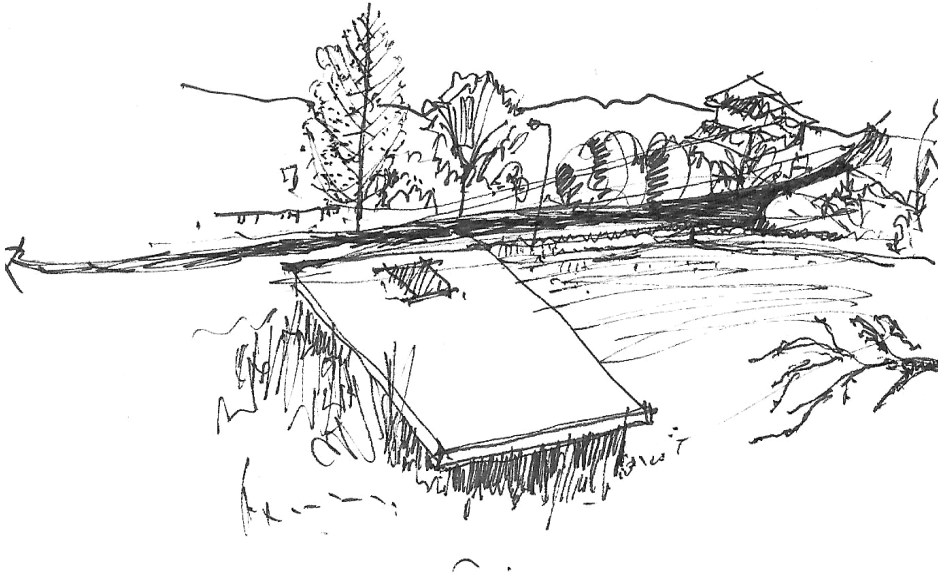


Fig.34. On site sketch, highlighting the tranquillity of the hill and the serenity of the surrounding neighbourhood.

Ten primary schools and seven high schools make up the original planning of Oudstad. Children are a large part of the success of the *3rd place* in Atteridgeville due to their prominence in the public realm.

After-school activities range from the organised sport training and competitive leagues to the less formal street games and socialising. The wide streets provide the children with a place for recreation as they wait for their parents or working relatives to return home (see Volume I).

The presence and safety of children become an integral part of the

framework. It is vital to provide a place for them to congregate safely, share and communicate ideas and skills. Finally, to experiment and be encouraged to remain curious.

The proposed framework attempts to create an inclusive site to act as a stimulant for the *urban receptors* (described in 4.4.1). The micro-scale intricacies should be respected and built upon to ensure the safety and well being of the predominant user. Furthermore, the site should express the value of water in all aspects of life, from the household scale to the planet at large.

# 03

## SITE ANALYSIS

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*Uncover the spirit of place*

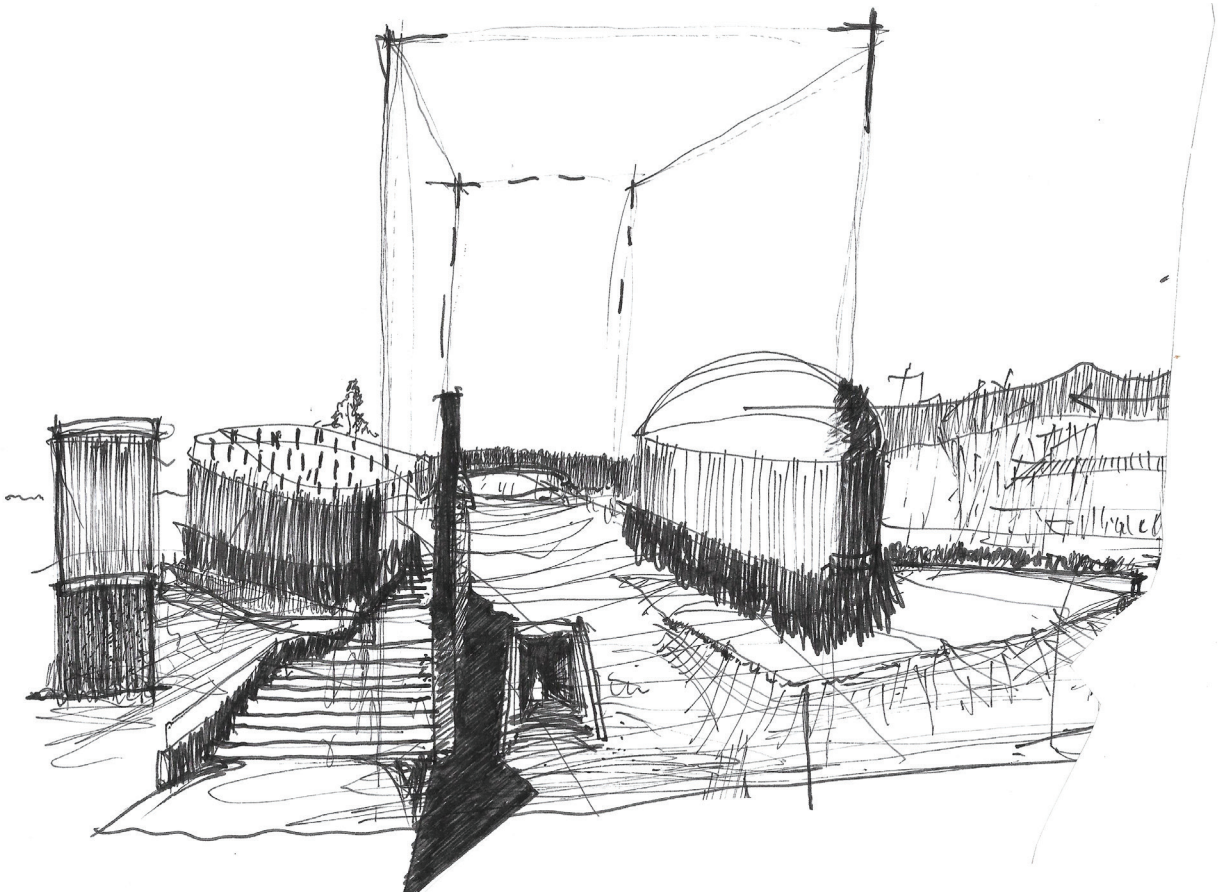
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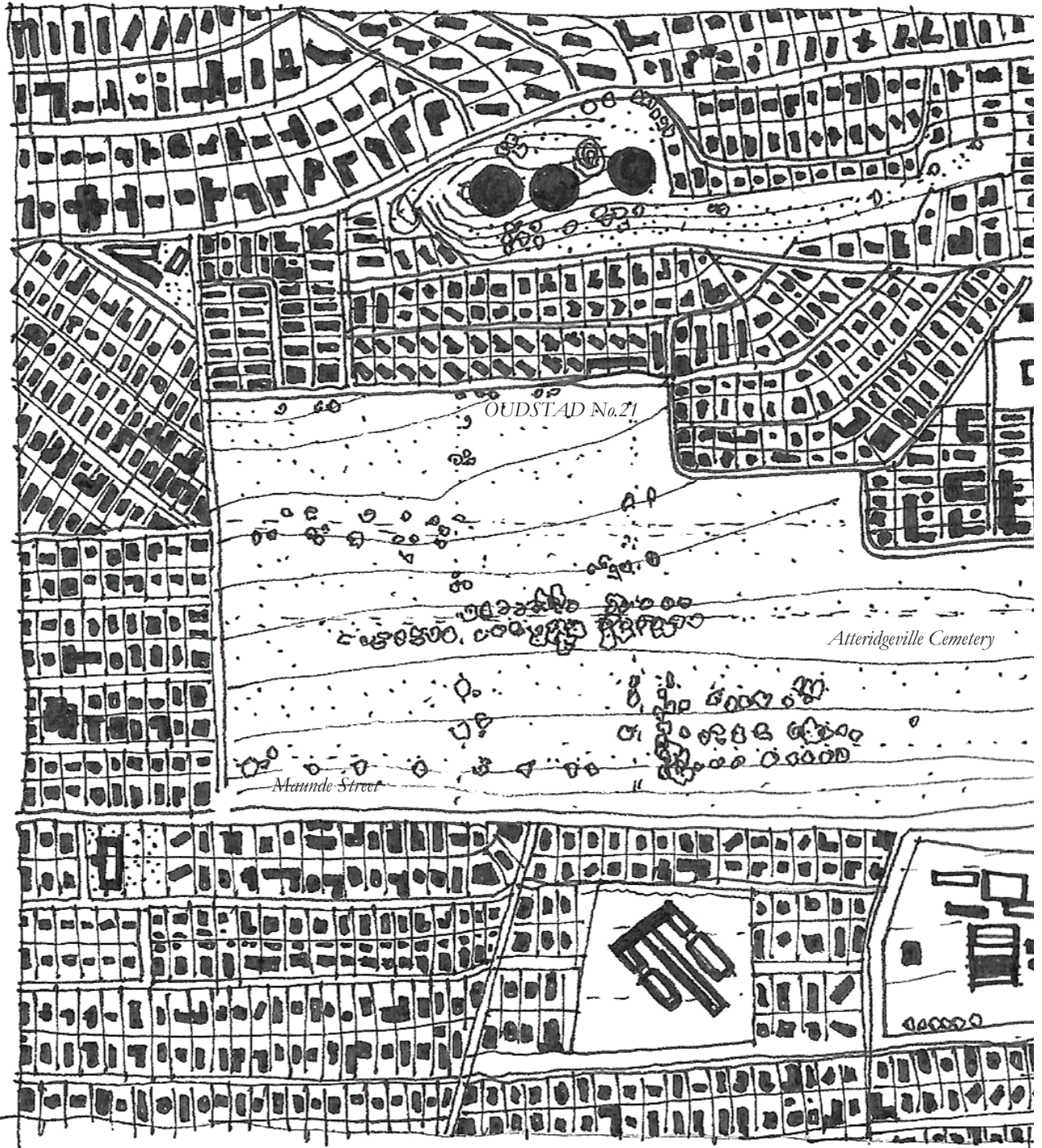
Identifying the internal forces and external conditions that give the site its unique character, highlighting possibilities and understanding the qualities of space and the opportunities they provide. Sketches, history, photographs and precedents aim to uncover the spirit of the site.

Fig.35. Conceptually activating the vertical plane on site. Connection with sky. March, 2016.

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## OUDSTAD No. 21





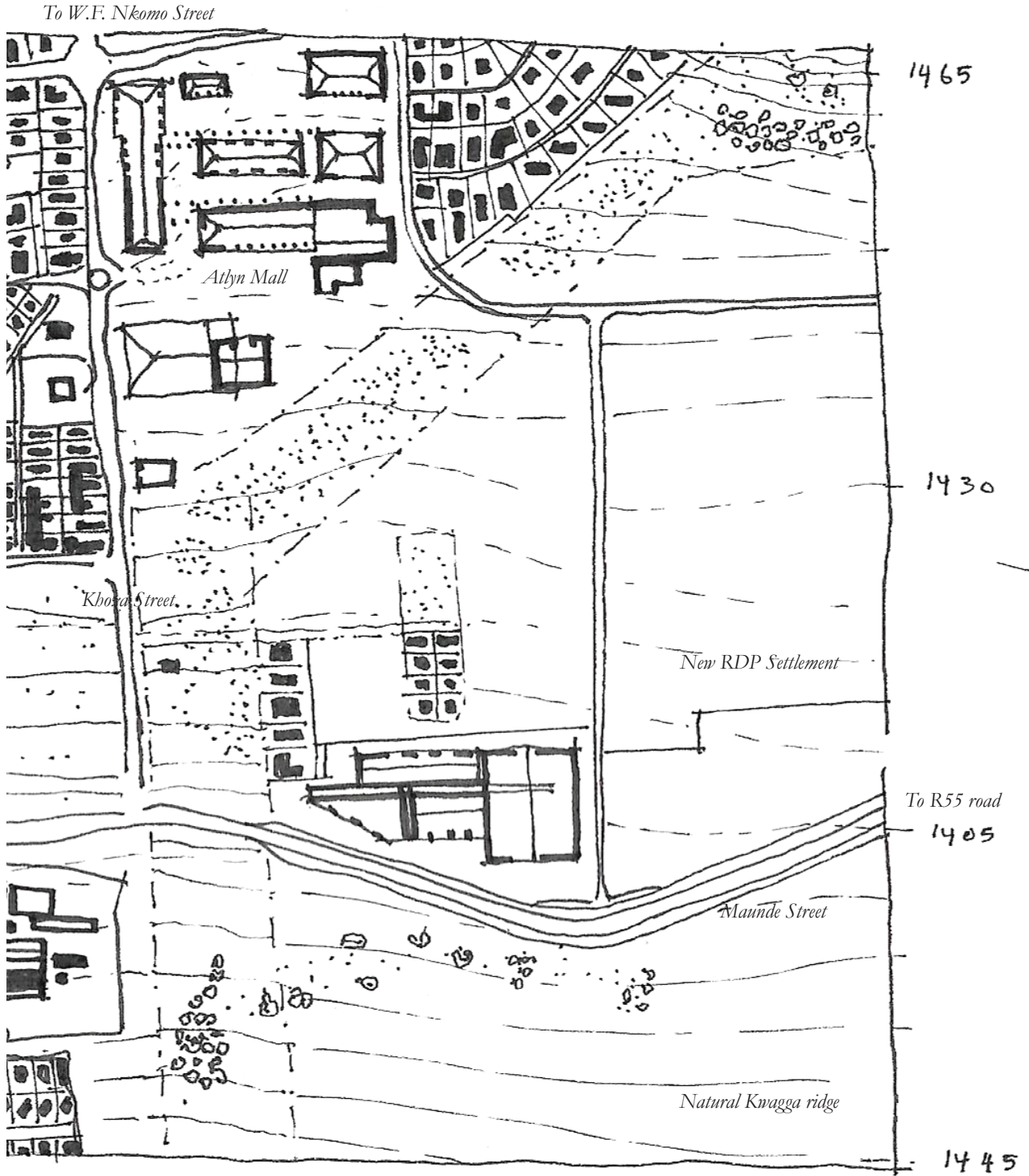


Fig.36. Noli map of site in the larger context highlighting Maunde Street, Atteridgeville Cemetery and Atlyn Mall. August, 2016.

## 3.1 AWARENESS OF PLACE

*Defining the Genius loci*

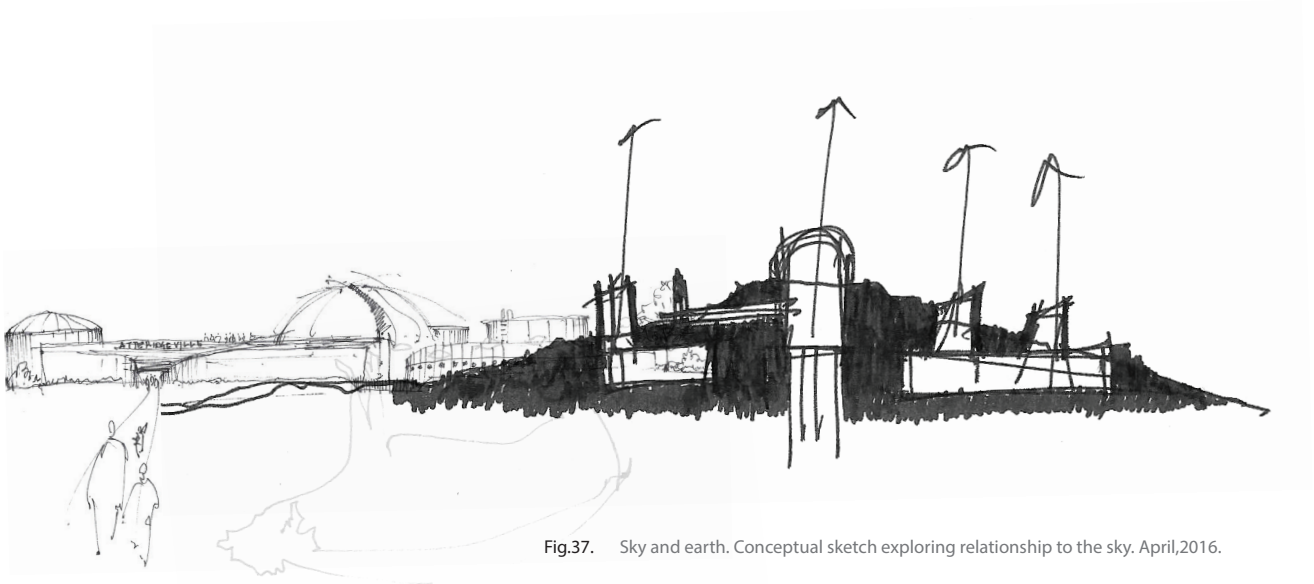


Fig.37. Sky and earth. Conceptual sketch exploring relationship to the sky. April,2016.

*“Greater awareness of the negative space may help us to better respect our surroundings by realising its unevenness and how difficult it can be to architecturally frame and integrate a spirit that is far older than anything within our usual realm of reference.” Ozuzman, (2002:13)*

1 » *The neighbourhood park*

Due to the gradual slope of the site, only certain activities can be accommodated. Running, jumping, hiding and child's play are encouraged. Whilst sports and picnics might prove difficult due to the constant fall. This encourages visitors to explore better options on site.

2 » *Damaged landscape*

The embankment creates two severed conditions, the first is the street condition and the second the plateau. This embankment, like a boundary wall, keeps energy out. Overcoming this barrier allows the site to be better connected to Mankopane Street.

3 » *Natural landscape*

This segment of the site is currently overgrown with grass and bushes. There is opportunity here to restore the ridge to its natural state. Introducing a demarcated movement route allows visitors to meander without destroying the restored ridge.

4 » *Visual Route*

The colloquial term for a thoroughfare is "double-up", this route allows the daily user to double-up around the apex of this hill while giving the passer-by the opportunity to appreciate the surrounding natural landscape and homes of Atteridgeville.

5 » *Barriers*

Two residential lots block the tail-piece from reaching the high street, Khoza. This barrier creates a desolate left over space on the hill. Renegotiating these barriers might aid in creating a well connected park. Drawing energy from Atlyn mall.

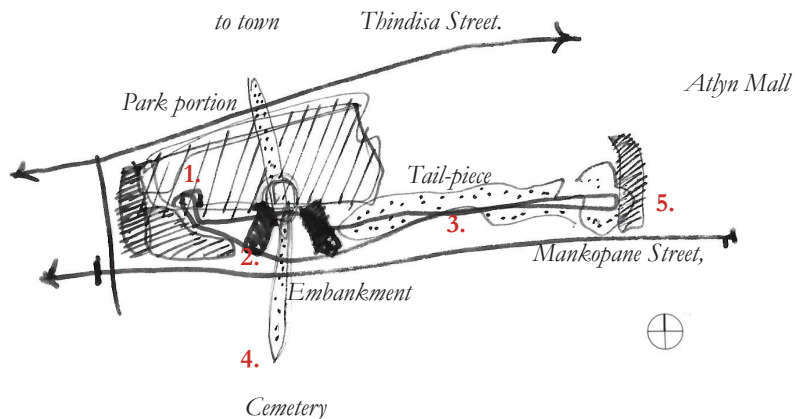


Fig.38. Zoning diagram illustrating areas of common spatial qualities. May, 2016.

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## 3.2 CHRONOLOGICAL PROFILE

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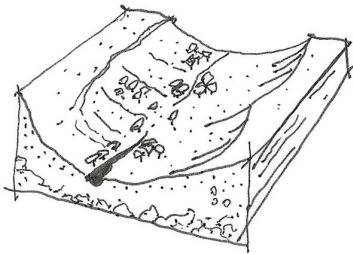
*Development of site*

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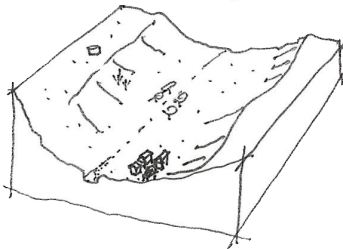
Fig.39. The 8Ml tank up-close. May, 2016.





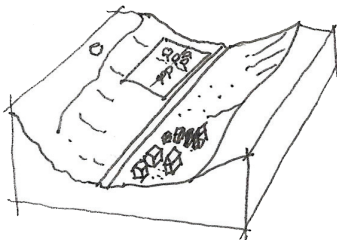
1 » *First Nature - Pre 1936*

The hilltop was part of a larger whole - belonging to the highveld region, forming a unit in the network of articulated ridges and savannah grasslands. This is characteristic of the geographic region in which Pretoria was established (Stals 1998:42).



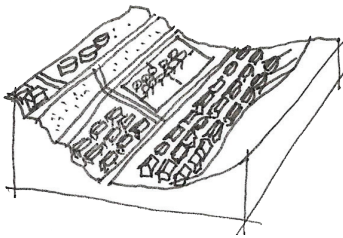
2 » *Mrs. Atteridge - 1936*

406ha are set aside to provide 3000 new homes for the relocation of African residents out of Marabastad and into Atteridgeville. A four Mega litre tank is amongst the first amenities to be provided (Stals, 1998:47). This is the first intervention on the hilltop.



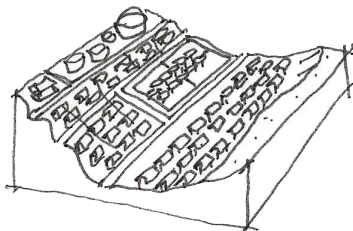
3 » *Original layout - 1939*

Atteridgeville's initial planning of 3000 plots was revised to a total of 5800 new plots. The cemetery was demarcated and laid out at the base of the hill. Water supply would not be met by the original four mega litre tank.



4 » *Reconfiguration of allocated plots - 1951 - 1953*

The plot allocation of the first 406ha had to be reconfigured to accommodate 6278 new plots (Stals, 1989:50). Two new eight mega litre tanks are erected to supply the new demand. The sum of the supply of the reservoirs now amounts to twenty mega litres.



5 » *Saulsville - Post 1953*

Having undergone numerous revisions in the planning process, the Pretoria City Council decided to introduce a 40 meter diameter tank. This tank had the capacity of all three tanks combined. The original tank was decommissioned after the completion of the twenty mega litre addition.

Fig.40. Imaginative diagram of the development of site in context

### 3.3 SITE STUDY

#### *Topographical analysis*

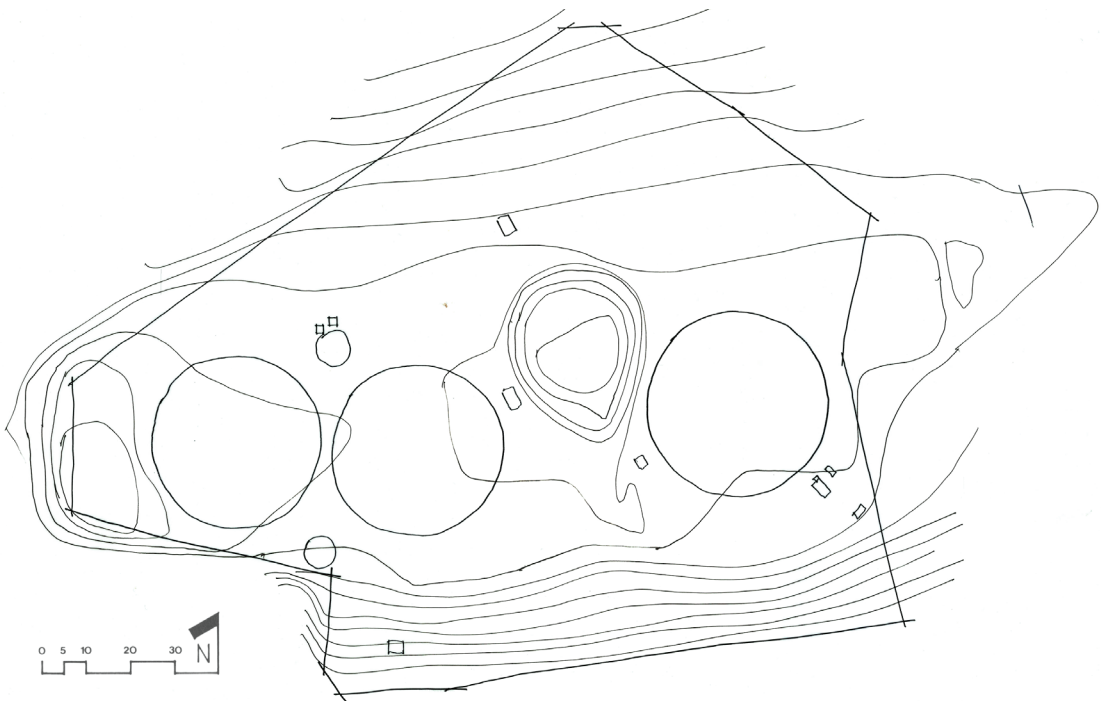
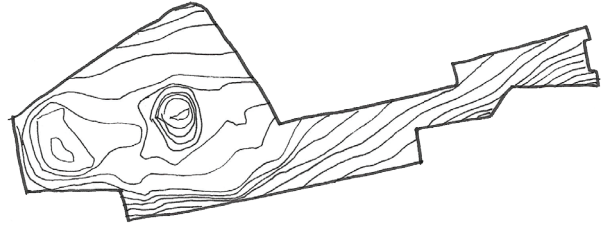


Fig.41. The contour map. The gentle slope on the north can be compared to the embankment on the south.

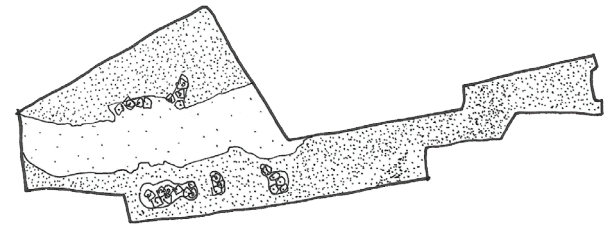
1 » *Topography*

The site has a unique plateau upon which the tanks rest on. Furthermore the submerged tank has been naturally reclaimed by the highveld. Towards the south the harsh slope is noticeable.



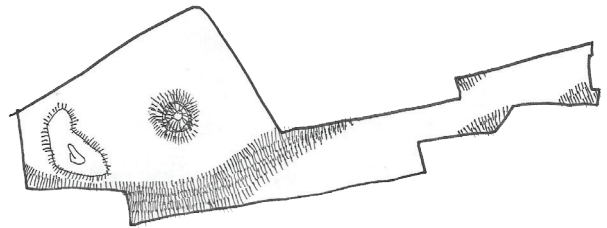
2 » *Vegetation*

With the exception of the trees planted to conceal the water tanks, the site remains in its natural state. Showing resemblance to the undisturbed ridges south of the site.



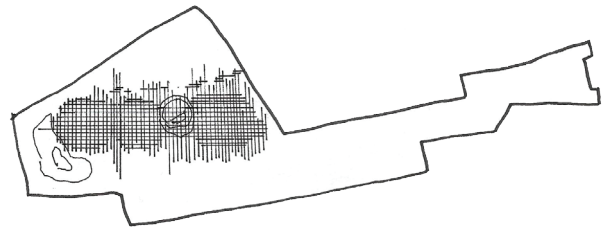
3 » *Embankment*

The large plateau created as the platform for the water reservoirs has resulted in an escarpment on the southern portion of the site. Displaying slopes reaching 1:4.5.



4 » *Ruined*

The placement of the water reservoirs has divided the site into two separate portions, the north, and south. Whilst the north invites larger crowds, the south is nestled between the residences.



5 » *Special features*

The site boasts vistas and routes of discovery. The procession and sequence of events is very much controlled by the topography and moments of rest.

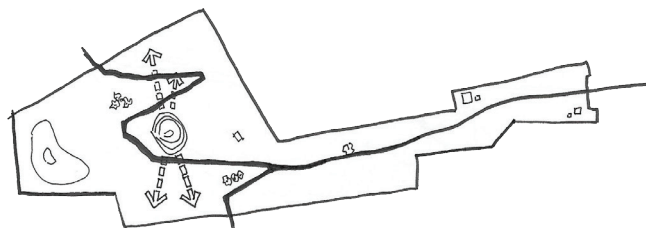


Fig.42. Understanding the conditions of the site. July, 2016. NTS

## 3.4 PHOTO ESSAY

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### *Reclaim*

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The following collection of images serve as the conclusion to the qualitative analysis. Inviting the viewer to experience the domination of the concrete reservoirs on the ridge, and the connection to the sky and beyond, it becomes clear that Oudstad No. 21 can be categorised as a 'green island', due to its disconnection from the urban fabric.

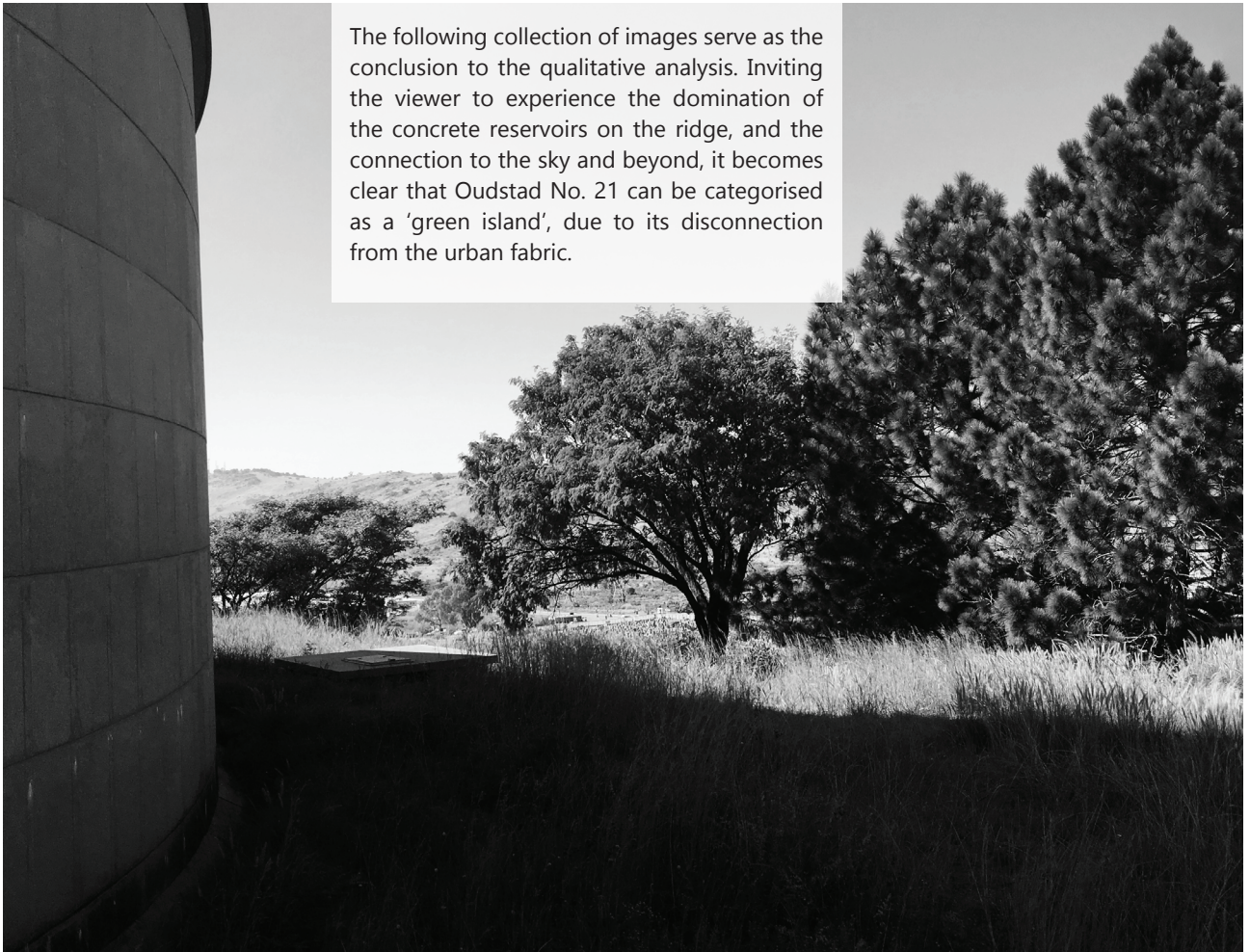




Fig.43. From the Plateau. View south, only the rooftops of the surrounding homes are visible. In the valley, the homes of greater Atteridgeville. Clear winter sky, May, 2016.



Fig.44. Passers-by on Mankopane Street. Nestled between the homes on the hill top, the site is completely hidden from its immediate context. February, 2016.



Fig.45. The hills beyond. View south over-looking the quality control tank. In the distance the Quaaqa Mountain range stretches east separating Laudium from Atteridgeville . April, 2016.



Fig.46. The 20 Mega litre tank





Fig.47. Panorama looking north towards Lotus Gardens.



Fig.48. View of the green island.



Fig.49. View towards disused buried tank.





Fig.50. Formidable. The three platonic circles stand side-by-side fortifying the site, looking east the dome of the 20Ml tank can be seen in the background. April, 2016.



Fig.51. Looking North the disused tank provides another plateau which acts as a lookout point. Figure 24 shows the view north onto Lotus Gardens, dubbed 'silver lakes' due to the tin roof construction seen in recent developments. April, 2016.



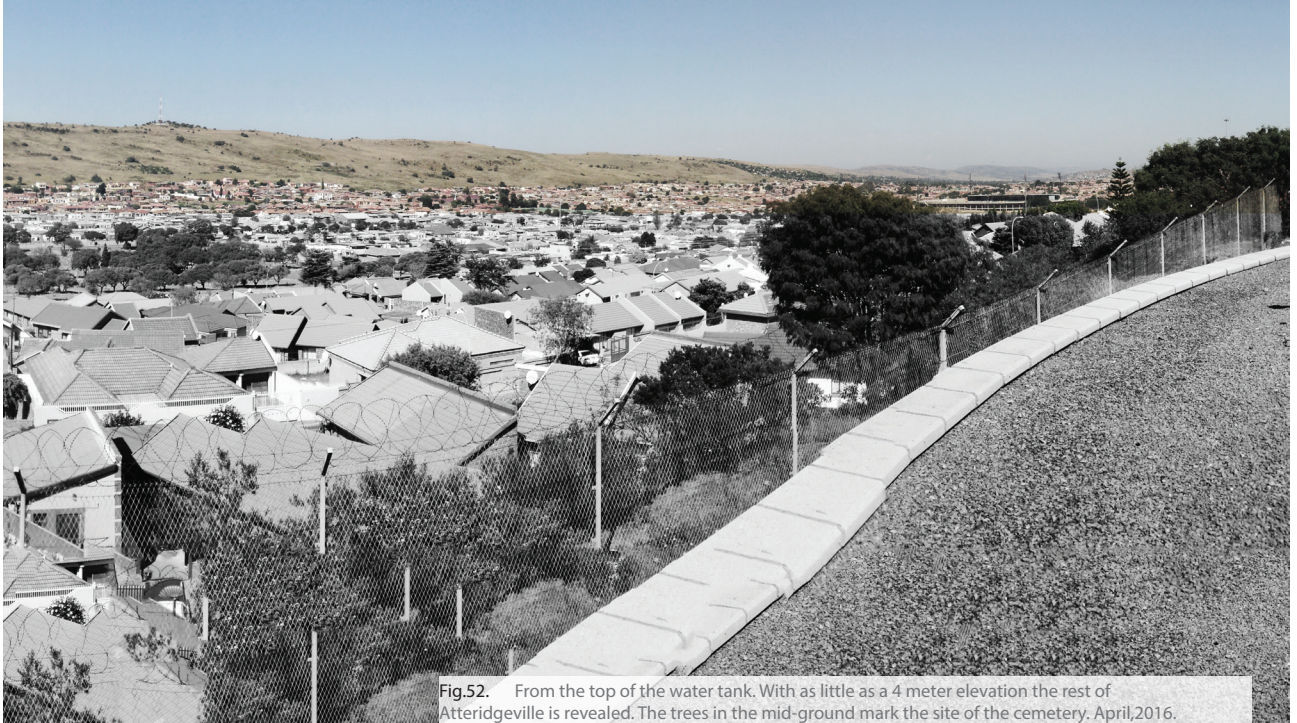


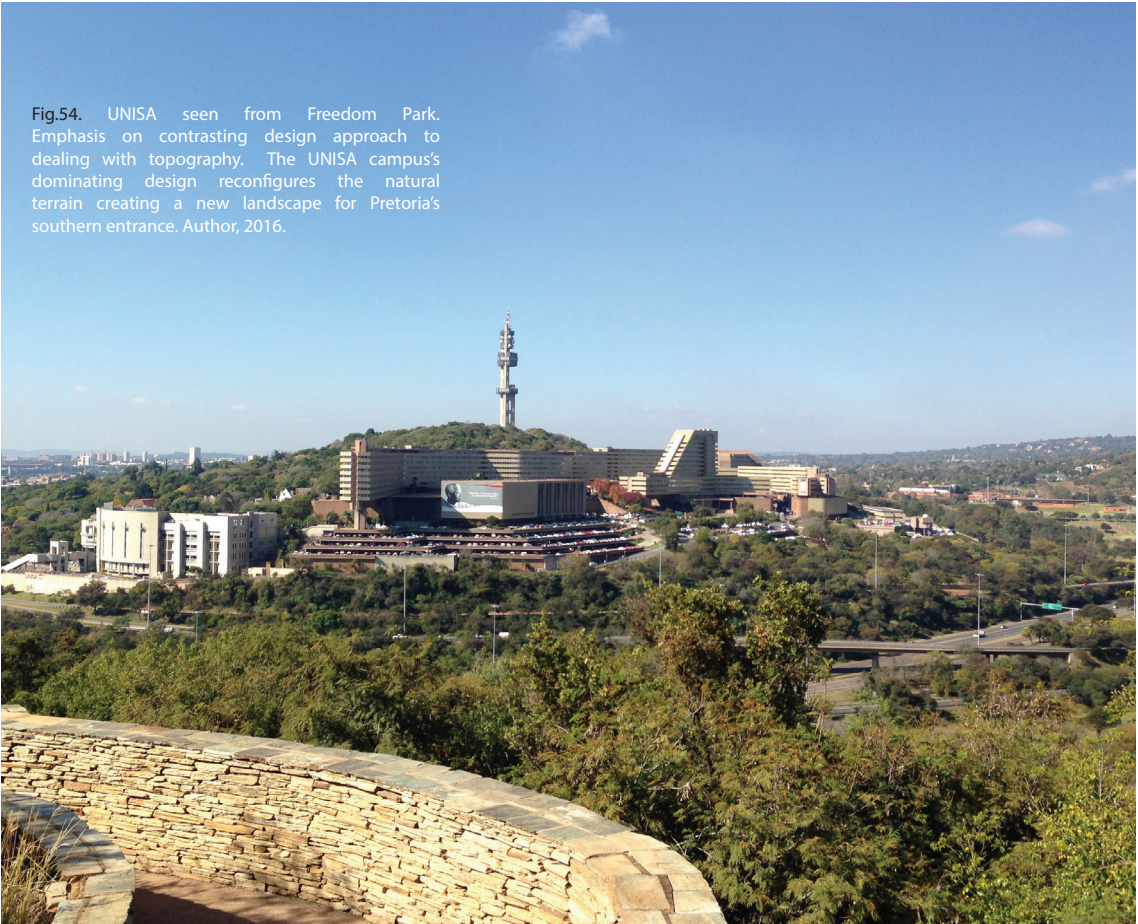
Fig.52. From the top of the water tank. With as little as a 4 meter elevation the rest of Atteridgeville is revealed. The trees in the mid-ground mark the site of the cemetery, April, 2016.



Fig.53. BFG. The gigantic tanks are softened by their round shapes. Direction and movement are guided where they bottle-neck. Foreground and background: 8ML tanks, mid-ground quality control tank, April, 2016.



Fig.54. UNISA seen from Freedom Park. Emphasis on contrasting design approach to dealing with topography. The UNISA campus's dominating design reconfigures the natural terrain creating a new landscape for Pretoria's southern entrance. Author, 2016.



## GAPP, MASHABANE ROSE + MMA, 2000

FREEDOM PARK  
PRETORIA, SOUTH AFRICA

Jonathan Noble's (2016) lecture on *African Identity in Post-Apartheid Public Architecture* questions the notion of commemoration in an African context. Noble argues that the focus is on practices and rituals which are symbolic, rather than emphasising the object. He explains that the focus on form is a Western notion. Noble uses Freedom Park to illustrate an understanding of this notion. The subtle presence of architecture (the reed lights) on the Salvokop hill exemplify a dematerialisation of monumentality, contesting the monolithic structure of the Voortrekker Monument and the University of South Africa Campus seen above.

## AUTHOR'S NOTES

Inspiration drawn from this project includes the approach to a significant ridge. The sensitive layering of the site merges the landscape with the architecture. Pathways meandering in the landscape create individual pockets of space that allow for contemplation while the buildings provide opportunities for collective gathering.



Fig.55. The Freedom Park. Southern Elevation, Architecture is noticeable in the Reed lights at dusk. Graham A. Young, 2012.



Fig.56. Pretoria CBD from Freedom Park. The relationship of Natural features with urban cores. Author, 2016.



Fig.57. Provision of safe environment for children. Image courtesy of Colectivo720

## COLECTIVE720, 2014

ARTICULATED SITE

WATER RESERVOIR AS A PUBLIC PARK, MEDELIN, COLOMBIA

The site comprises of four municipal fresh water tanks. The project makes use of two disused tanks and maintains the function of the other two. The intervention aims to create an inclusive environment which serves the surrounding neighbourhoods while maintaining functionality of the tanks. As described by the architects, the scheme combines leisure and function in unused spaces in the city, providing relief to a dense portion of the city with a quality park environment. (Lafarge Holcim Foundation, 2016).

The scheme successfully intertwines Architecture, Landscape, Infrastructure and Urban Design, to create a civic space aimed at the local resident. This complexity is achieved by bringing energy to an otherwise overlooked site, giving back to the surrounding neighbourhoods.



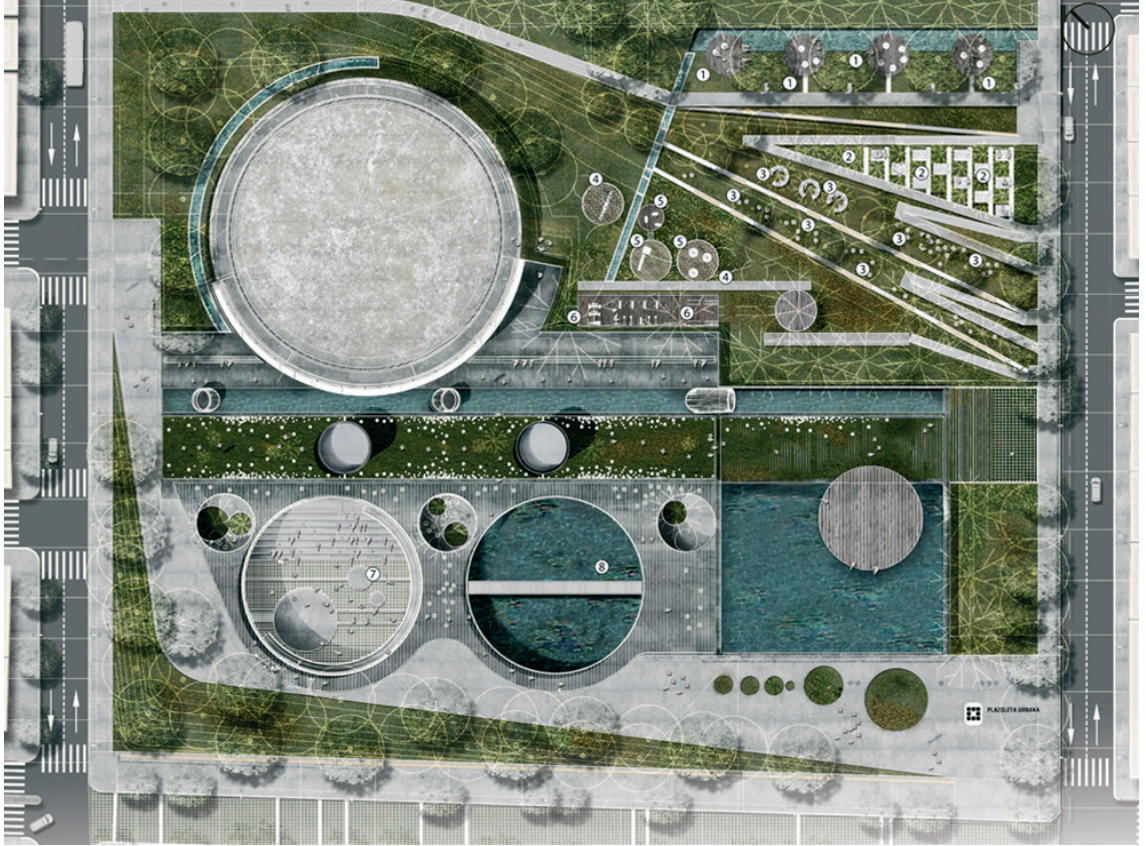


Fig.59. Maintaining functionality of the site while proposing new functions for the disused tanks. Image courtesy of Colectivo720



Fig.58. Reintegration of unused site into urban fabric. Image courtesy of Colectivo720

# 04 PROGRAMME

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## *Navigating born-free South Africa*

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The programme looks to encourage children to remain curious, and provide a platform for them to gather and meet. Establishing a place where they can explore, play and collaborate with other children from the Tshwane region.

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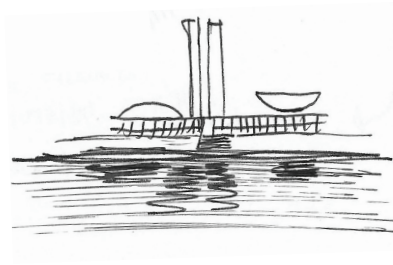


Fig.60. Brasilia National Museum, from a distance. Oscar Niemeyer. Imagine the excitement of a five year old child approaching this building... "What is it?"

## INVITATION TO WONDER

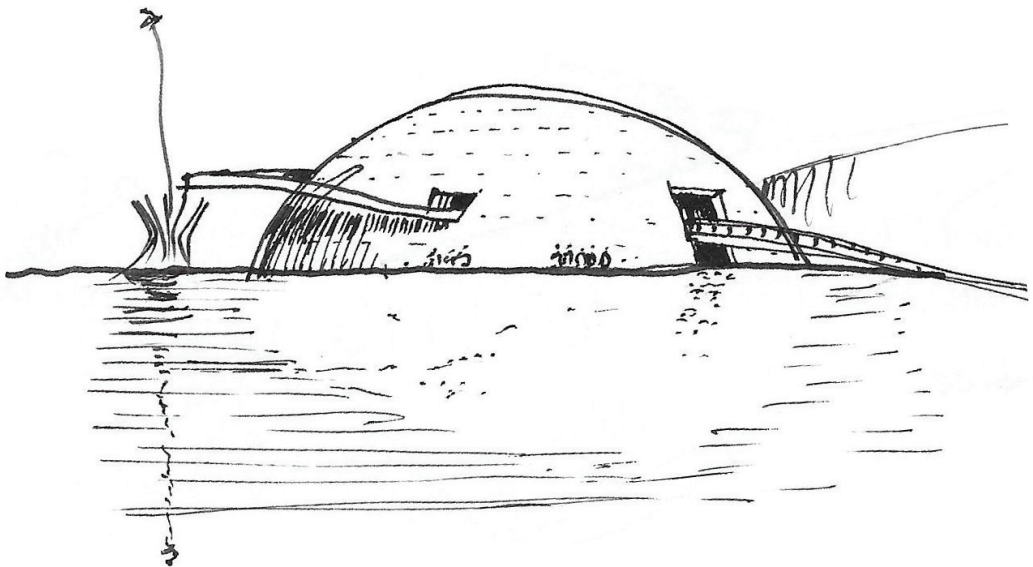


Fig.61. Brasilia National Museum, close up. Oscar Niemeyer.

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## 4.1 AFRICAN SPACE

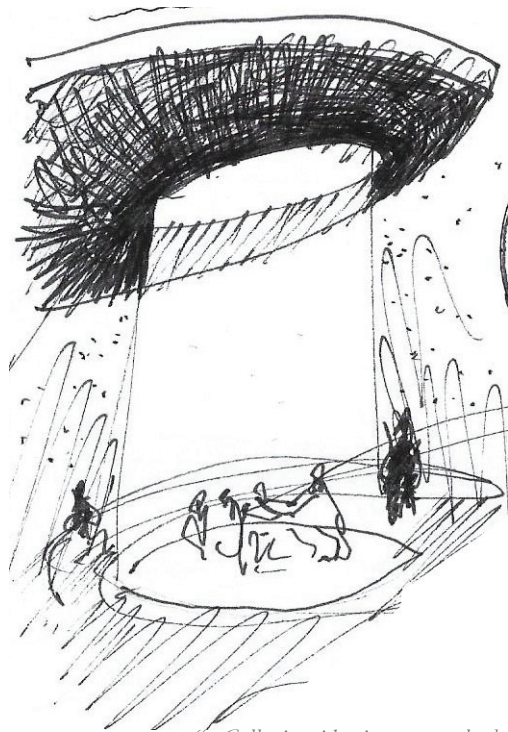
*Collective expression, individual experiences.*

Supporting Jonathan Noble's discussion on African space, Dr. Emmanuel Nkambule (2016), argues that the theory of the South African Collective Space is anchored in landscape and activity. He elaborates on this by explaining that the success of African collective space can be attributed to understanding two fundamental concepts. First, the notion of the boundary in traditional terms, and second, the significance of events and rituals.

He describes the boundary as a demarcated space to contain livestock. This underlying definition suggests that boundaries are functional in nature, and limited to domesticated animals. Their purpose is to contain as opposed to the suburban notion of the boundary fence: to keep out. Furthermore, the significance of event stems from its ability to strengthen relationships and establish new ties. When these practices are conducted in collective spaces, they help to introduce children to the community's value systems and embraces them as a part of the collective.

The quantitative analysis identifies children as the predominant user of the 3rd place in Atteridgeville, hence the research explores how children interact and communicate to provide a place for them to gather. The study does not

limit itself to the children of Atteridgeville. Instead the site should function as a *honey-pot* drawing visitors from greater Tshwane. Utilising African space making ideals to create a new learning landscape.



*“...Collective identity can only be defined upon respecting the rights of the individual.”*

*Dr. Nkambule (2016).*

## 4.1.1 “THE CAVE GAME”

### *Lively and animated character*

The fascination with space making is intrinsic to human nature. Rasmussen’s (1964) book *Experiencing Architecture* describes the awakening of spatial awareness in a child’s development-process as the progression in the tradition of building. He calls this the “cave game”, the time when children begin to enclose spaces for their own use.

Their imaginations feed a narrative which is reflected in their personalised enclosures. Material choice, positioning of the enclosure in relation to its surroundings and entrances are all considered and manipulated by the young builders.

Public spaces have a fundamental influence on a child’s imagination, It is a break from the ordinary or mundane, and provides an opportunity to learn (Marmor,2009). A child can be found exploring patterns on the

floor, textures on walls, flex in balustrades and friction on tiles, all providing hours of experiential learning.

Marmor (2009) describes how a trip to the zoo might have a completely different educational outcome to a child. Her lecture on the *Insights into the Mind of a Child* reveals that children will continue to explore their environments empirically until the age of 11-12, at which point all their experiences will be explored through reason, including play.

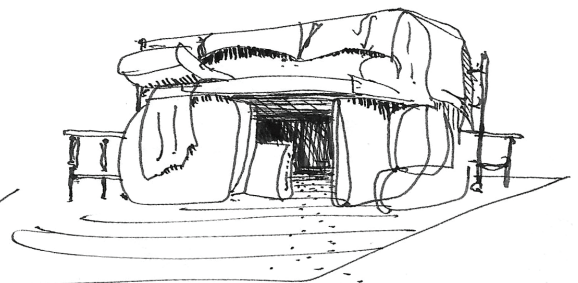
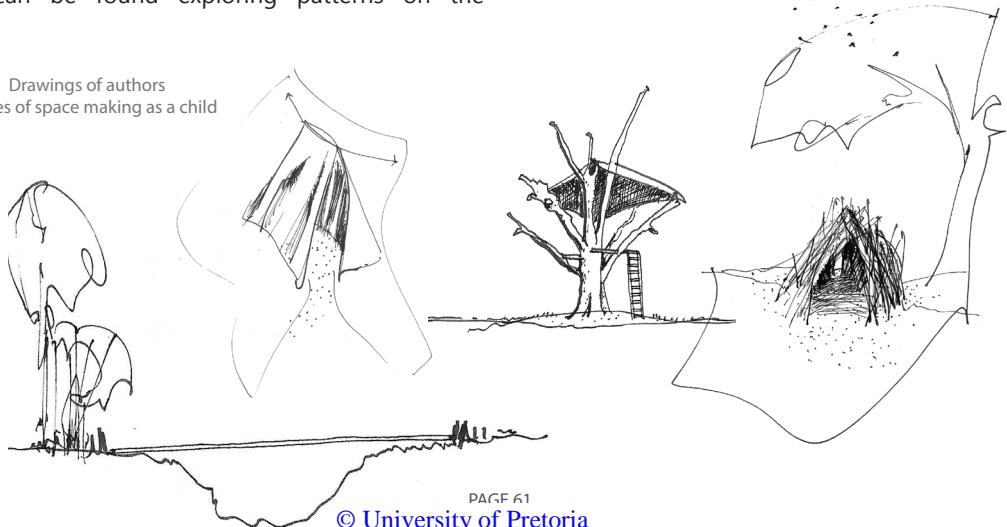


Fig.62. Drawings of authors memories of space making as a child



## 4.2 PARTITIONING

### *Quality of place*

The site analysis recommends that the site is partitioned into three segments, each to highlighting the quality of activity supported by the terrain. Shown in Figure 63, the site displays a clear north, south and a lateral segment. These segments culminate where the decommissioned tank is located.

The north portion is identified as the neighbourhood park. A place supporting larger gathering due to the forgiving nature of the slope. Here passive surveillance is achieved through considered placement of the proposed architecture.

The southern portion is reserved and quiet. The deteriorated landscape and escarpment is the result of levelling the site for the construction of the reservoirs. To rehabilitate this eroded segment of the ridge the proposed architecture shall respond to this deteriorated topography to remedy the natural features of the ridge.

Finally, the lateral segment provides a movement axis opportunity which connects the site to Khoza St. & Atlyn Mall, Figure 31.

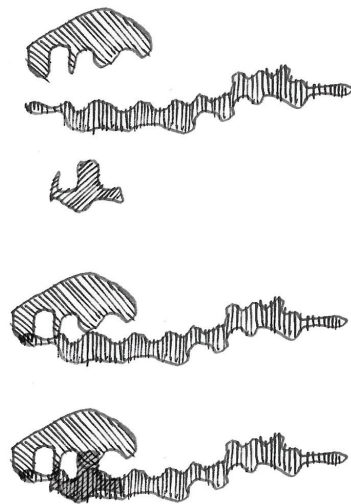


Fig.63. Spatial zoning. April, 2016.

*There is value in making use of the intrinsic qualities of natural features to synthesise programme and site.*

*Overcoming apartheid planning strategies, natural features such as prominent hills are no longer used as racial separating elements (buffers) rather they have the potential to become places of recollection.*

## 4.3 PROGRAMME

### *Children and the 3rd place*

Adapted from Jean Piaget's (1972) stages of cognitive development, the programme unfolds to highlight the evolution of children's understanding of their environment. Relative to the spaces created, Piaget describes the four stages of cognitive development to occur in succession of one another. He also describes that although children can and often wander between stages of cognitive development, they can only show full comprehension of a stage once the previous stage is exhausted (Marmor, 2009). The architectural programme seeks inspiration from the theory of Cognitive Development to derive the following sequencing of spaces for children to wander through.

- A. Perception
- B. Exploration
- C. Incubation
- D. Imagination

The first two phases act as spatial anchors relating to the outdoor functions, the latter are encapsulated in the built forms.

The programme requires a sequence of

spaces that would entice the children to remain curious. Children are encouraged to explore and interpret the site as they please. The wandering process is dictated by the child's attention span.

The architectural response to the requirements of the programme manifest in a series of storytelling enclosures, linear organisation of movement, outdoor rooms and regroup spaces.



Fig.64. Third Place 03 Play. (Nel & Sadiq, 2016)

## 4.4 PATRON

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### *Thebe Medupe*

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Dr. Thebe Medupe highlights the importance of education in the life of young South Africans. Recognising Medupe as a positive contemporary role model, his work can be used to entice young scholars to pursue career choices relative to their line of interest.

Dedicated to the same cause of encouraging children to see their world beyond the current day township circumstance, it is proposed that the planetarium will commemorate the dedication of Dr. Medupe in exposing young South Africans to fields of study beyond what they are accustomed to.

Thebe grew up and completed his education during the apartheid regime. With as little as a cardboard roll and two lenses, he built his first telescope and took to the African sky in his home town outside Mafikeng. Mentioning that if it was not for his crude telescope he would have never imagined the mountains on the Moon (Foster, 2002).

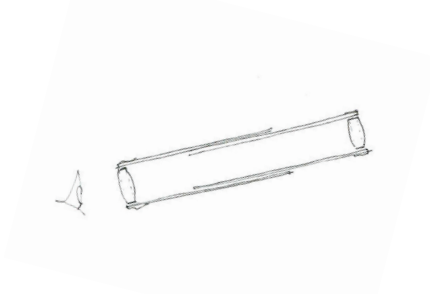


Fig.65. Crude telescope. A sketch of the telescope which ignited Thebe Medupe's curiosity. October, 2016.



## 4.4.1 CLIENT

### *Urban receptors*

As discussed by Oldenburg (1989) in his book *The great good place*, the theory of the 3<sup>rd</sup> place is defined as the place in the city that we like to spend time in. 1<sup>st</sup> and 2<sup>nd</sup> place are defined as home and work respectively.

In order to create an environment of 3<sup>rd</sup> place qualities the study identified the main user of existing 3<sup>rd</sup> places in Atteridgeville. This is done to develop an appropriate response, while considering the planetarium.

Children are described as receptors due to their ability to absorb and engage with external stimulus. The provision of a programme which would harness and encourage children's ability to freely engage and interact with other children from the Tshwane region, is subsequently interrogated. This programme's ability to draw external energy means that it is not confined to children of Atteridgeville, thus providing a 3<sup>rd</sup> place for the *Urban Receptors*.

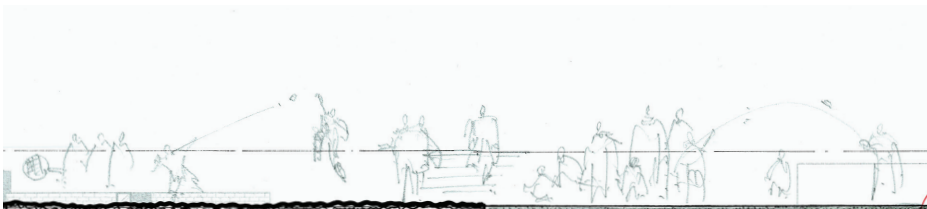


Fig.66. Urban Receptors. The children of Tshwane envisioned playing and engaging in the outdoor rooms. July,2016.

## 4.5 THE PLANETARIUM

*Invitation to wonder*

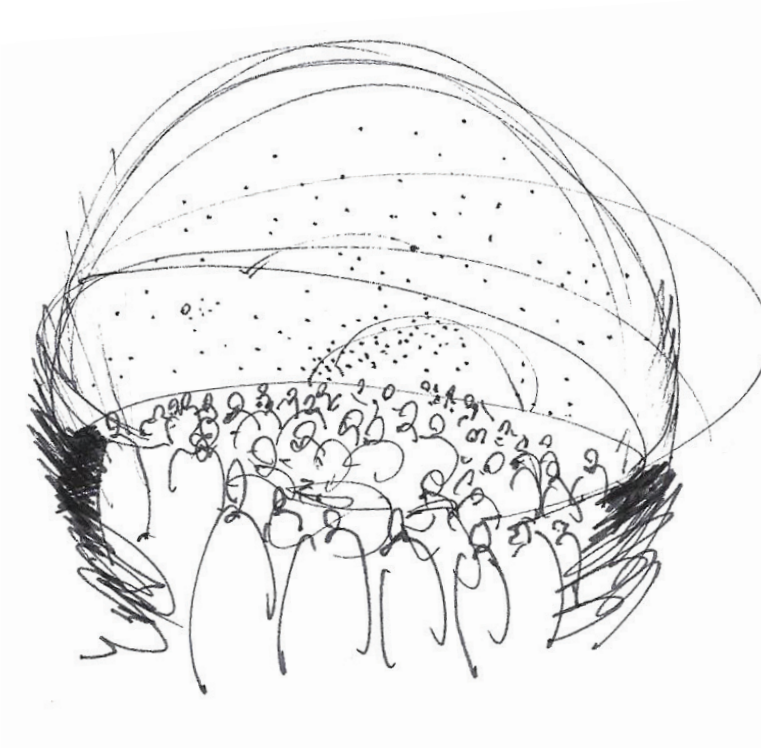


Fig.67. The Thebe Medupe Planetarium. Dedicated to the South African astrophysicist, the planetarium takes inspiration from his work *Cosmic Africa* which attempts to reconcile Myth and Science (Foster, 2003).

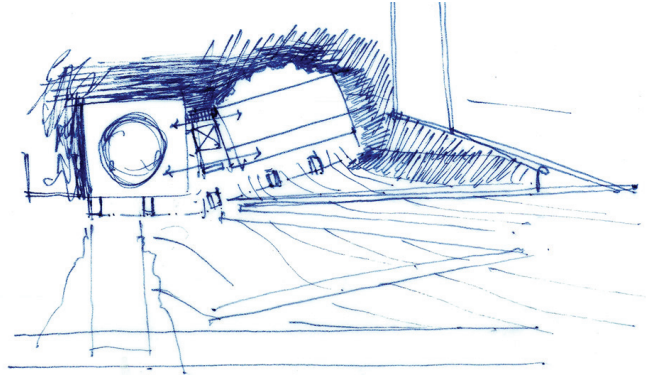


Fig.68. Configuring the planetarium. August exploration.

The combination of duty and entertainment into a single space has led to the success of shopping malls and gymnasiums in the last decade in South Africa. The notion of an affordable, collective-public-destination (such as a museum) has no apparent value in contemporary South Africa. Museums are often affiliated with the elite or society's minority. Such destinations are therefore regarded as educational formalities, and rely on a network of schools to include them in their list of excursions for interested students (refer to Figure 72).

However, the success in merging the of spirit of place and function can create an environment that attracts repeat visitors. Civic anchors can help to settle such public destinations by generating and containing energy. To reinforce the duality of myth and reason, and provide a curiosity bank for children throughout Tshwane, a planetarium is proposed as the civic anchor for the site. In addition to changing the perception of these inaccessible programmes, the planetarium will encourage a vast amount of external energy to penetrate into the once overlooked township. This is in response to the problem statement stipulated about the RDP in the introduction chapter of the dissertation.

## 4.5.1 THE FIRST MODERN PLANETARIUM

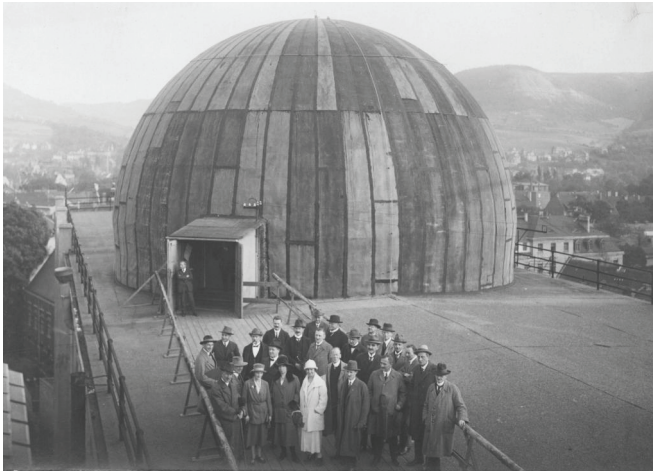
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*The Zeiss Planetarium - 1921*

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The first opto-mechanical projector was housed in a 16m concrete dome and opened to the public in 1924 on the roof of the Carl Zeiss Factory in Jena, Germany (Zeiss Group, 2010).

The success of this rooftop prototype inspired the first modern planetarium, as we know it today. Named after the Zeiss factory, the Zeiss Planetarium was built in 1928 in Jena, Germany.



**Fig.69.** The Zeiss Planetarium. Located on the roof of the Zeiss factory, Jena, Germany, 1924. The 16m diameter planetarium was the first to utilise projection technology to represent the night sky. Carl Zeiss Archive, 2010.

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## 4.5.2 THE ADLER PLANETARIUM

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*An invitation to wonder - 1930*

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The success of the planetarium was unexpected. Planetariums crept up in Europe as quickly as the Zeiss factory could supply the intricate projectors (Zeiss Group, 2010). The first planetarium in the west was commissioned by American businessman Max Adler. Completed in 1930 the planetarium quickly evolved into a civic destination. Seen below, the Adler Planetarium attracted more adults than children, seen queuing in anticipation to gain access.



Fig.70. The Adler Planetarium. Opening day, 12 May 1930. (Unknown, 1930)



Fig.71. The Johannesburg Planetarium. East Elevation captured from parking on Yale street. Author,2016.

## PARKER, PARKER & FINSEN, 1960

THE JOHANNESBURG PLANETARIUM  
UNIVERSITY OF WITWATERSRAND, JOHANNESBURG, SOUTH AFRICA.

The Johannesburg Planetarium opened its doors to the public on the 12<sup>th</sup> of October 1960. Today the Planetarium at the University of Witwatersrand hosts up to 77 000 visitors annually. (City of Johannesburg, 2009). The show is divided into three parts, focusing the content on the age groups of the visitors. Young children are taught about constellations and star signs. More mature age groups are exposed to the movements of the constituents of the solar systems whilst the advanced shows explore the field of astronomy in detail.

In the opinion of the Nationalist Party, it was decided that the planetarium would be erected in the campus of the Witswatersrand University. Although the planetarium would remain accessible to the public, the decision to place it within the campus made the building exclusive. Despite its location, the planetarium receives children from schools as far as KwaZulu-Natal (City of Johannesburg, 2009) but remains disconnected from the city dweller.

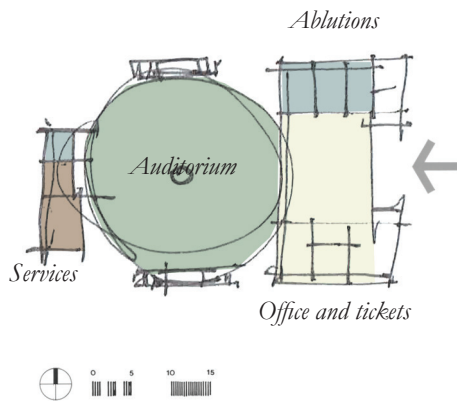


Fig.73. The Johannesburg Planetarium plan. The 400 seater is situated within the borders of the University.

The Johannesburg Planetarium also known as the Wits Planetarium draws a lot of external energy to the University of Witwatersrand campus. National facilities like the Johannesburg Planetarium have an outstanding reach, drawing visitors from all parts of the country. This foreign energy creates opportunities for engagement and collaboration. Unfortunately, the Planetarium is disconnected from the public realm as it sits within the campus boundary.

With recent student protests and university shut-downs, the Wits Planetarium has been non-operational. With up to 1200 visitors during school holidays (City of Johannesburg, 2009) the planetarium has potential to invite visitors to a new context. Photographed on a public holiday, the Wits Planetarium stands empty and fenced off from the neighbouring sports field. There is a missed opportunity to cross pollinate the planetarium with another function in order to maintain interest in these national monuments.



Fig.72. Panorama, Johannesburg Planetarium. North elevation, photographed on a public holiday. June, 2016.

## 4.6 KGALE HILL GABORONE, BOTSWANA

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### *The Pattern Language*

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On the horizon, the swells of the distant green hills divide the sky and earth. Looking below, the city's sparse fabric meanders as if spreading perpendicular to the vehicular artery:

*The Western bypass.*

The journey to the top requires one to climb over the rocks and through the bushes; with a few encounters with the wildlife, perhaps a puff adder or a troop of baboons:

*There were rumours of a leopard living here? No?*

With nature at our doorstep, we are cleansed by our ascension. We are now disconnected from the city. From here we observe the *patterns* of Gaborone: the traffic, the shopping mall parking-lots, the bus rank:

*You can hear it all the way up here if the wind blows right.*

From the peak of the hill, we discuss the location of our homes and our schools:

*Who will spot it first?*

*I didn't know the Western bypass was crescent shaped*



My understanding of Gaborone was shaped by my interaction with the only hill available. It provides the opportunity to ascend, and disconnect, in order to reflect.

In Pretoria, at every chance, I revisit my *'Kgale Hill'* experience on Johann Rissik Drive. Overlooking the inner city bowl, UNISA, the Union Buildings, the greenery stretching to the new east, and all the rooftops dispersed in between, I reflect.

In Atteridgeville I found *Kgale Hill* again at the site of the water reservoirs. By reclaiming a leftover site, a place can be provided for children to engage and be curious about their locales:

a platform to appreciate the intricacies of daily life, from within.

## 4.6.1 THE MODERN PARK

### *Choice in movement*

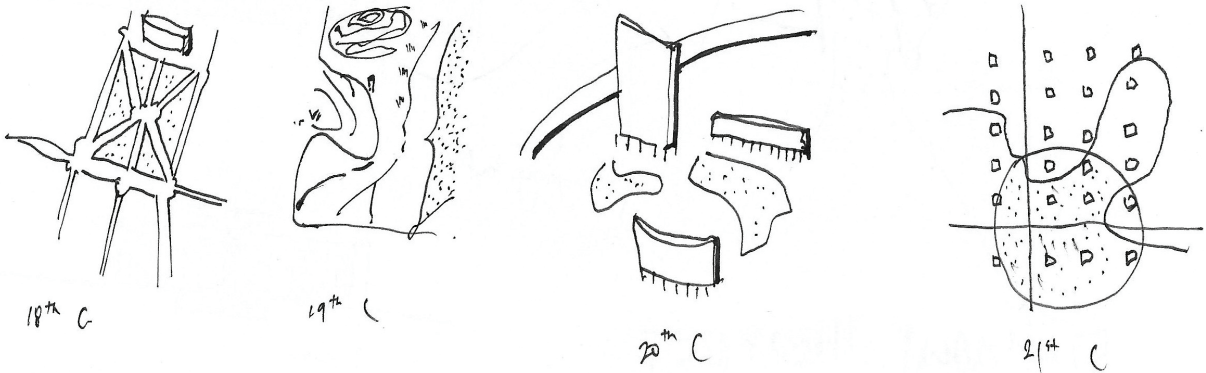


Fig.74. Bernard Tschumi. An urban park for the twenty first century? (1982).

During the 1980s Bernard Tschumi attempted to logically explain the nature of parks in the 21<sup>st</sup> century. His conclusion reveals that unlike previous centuries where nature was, at first dominated, then imitated and later represented. His approach spoke of allowing nature to remain *natural*, while an arbitrary axes and ordering devices were necessary for the human user (Tschumi, 1987).

The diagram above on the far right reveals how approach, speed of journey and sequencing of event is determined by the user. Nature is allowed to remain natural and the man-made follies aid to accentuate the beauty of what is left untouched.

Tschumi's theory is used to create a programme that is fit for the site, producing an institution on the hilltop that aims to inspire and teach people about themselves and their environment - through interaction and exploration. The user is given the liberation to explore the site at will, to wander and observe, finally by choice of the user participation will be encouraged through the functions of the building.

## 4.6.2 THE NEIGHBOURHOOD PARK

### *Approach to left-over space*

The design aims to integrate the left over site back into its context. In the same light, the programme aims to integrate the peripheral township of Atteridgeville back into Tshwane. Creating a place of wonder for children of all ages.

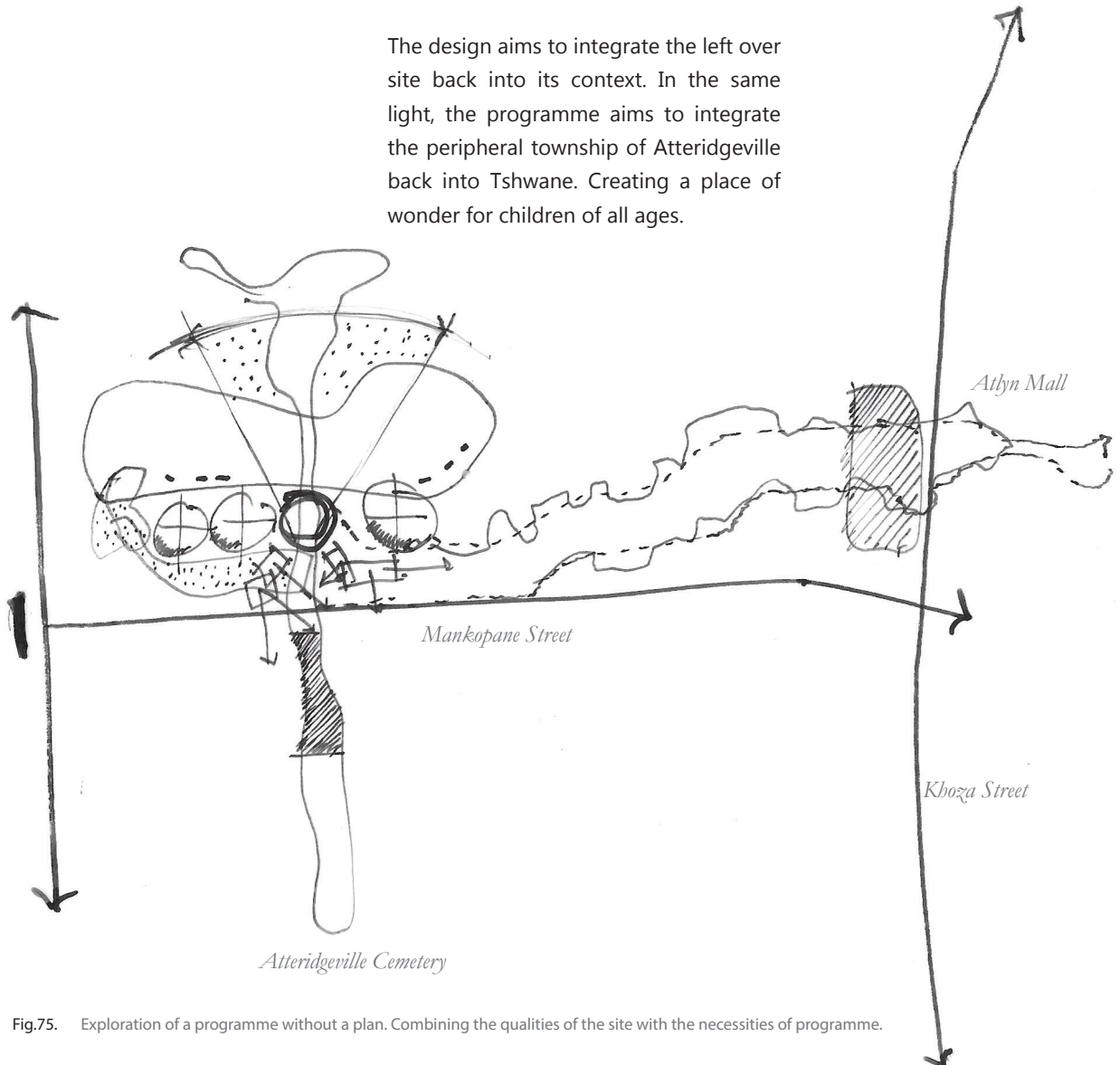


Fig.75. Exploration of a programme without a plan. Combining the qualities of the site with the necessities of programme.

## 4.7 MYTH

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### *The value of storytelling*

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Kumkummi - Bushman oral traditions: myth and history which provide an understanding of the cosmological framework in which the Bushman existed (Herman,2013). These traditions helped children negotiate the landscape, become vigilant and remain curious.

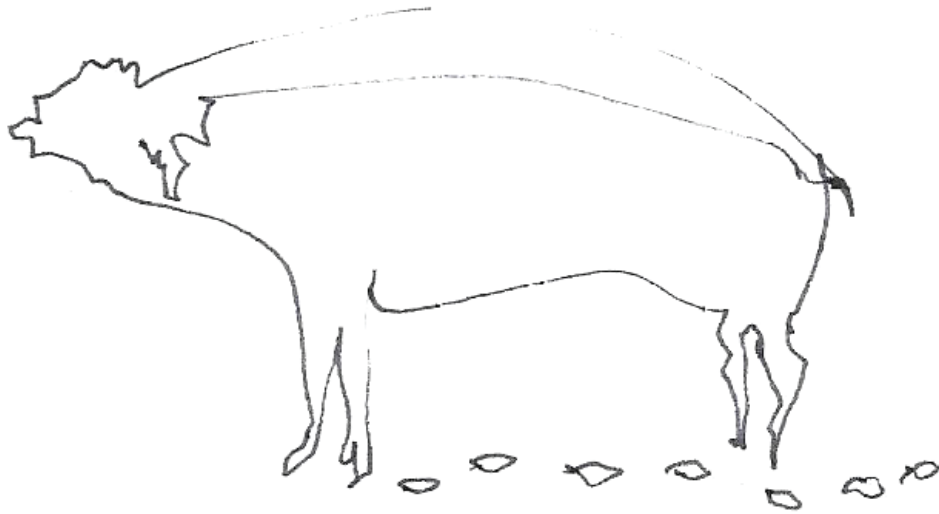


Fig.76. The Rain-Animal. Based on the description of the Rain-Animal given below.

*“...next time you observe a typical late afternoon thunderstorm realise that you are indeed seeing the Rain-Animal as the Bushmen saw it. The bank of clouds is its body and the columns of rain are its legs, as it walked across the land, renewing the plants, attracting the game and enabling people to have a time of plenty. The Rain-Animal’s passage is further ground-truthed in the round impressions raindrops make in the sand and which Bushman believed to be its spoor.” (Ouzman, 2002:11)*

# 05 CONCEPT

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## *Drawing the intention*

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The following chapter is dedicated to the design process which culminates as a building. Presented as a collection of thoughts, this journey is dynamic and does not conform to scale or dimension. Rather it is the refinement of an intention through its conception, development, testing phase and finally numerous iterations. This evolutionary process maintains the concept deep in its DNA and allows the building to grow freely into an architecture of place.

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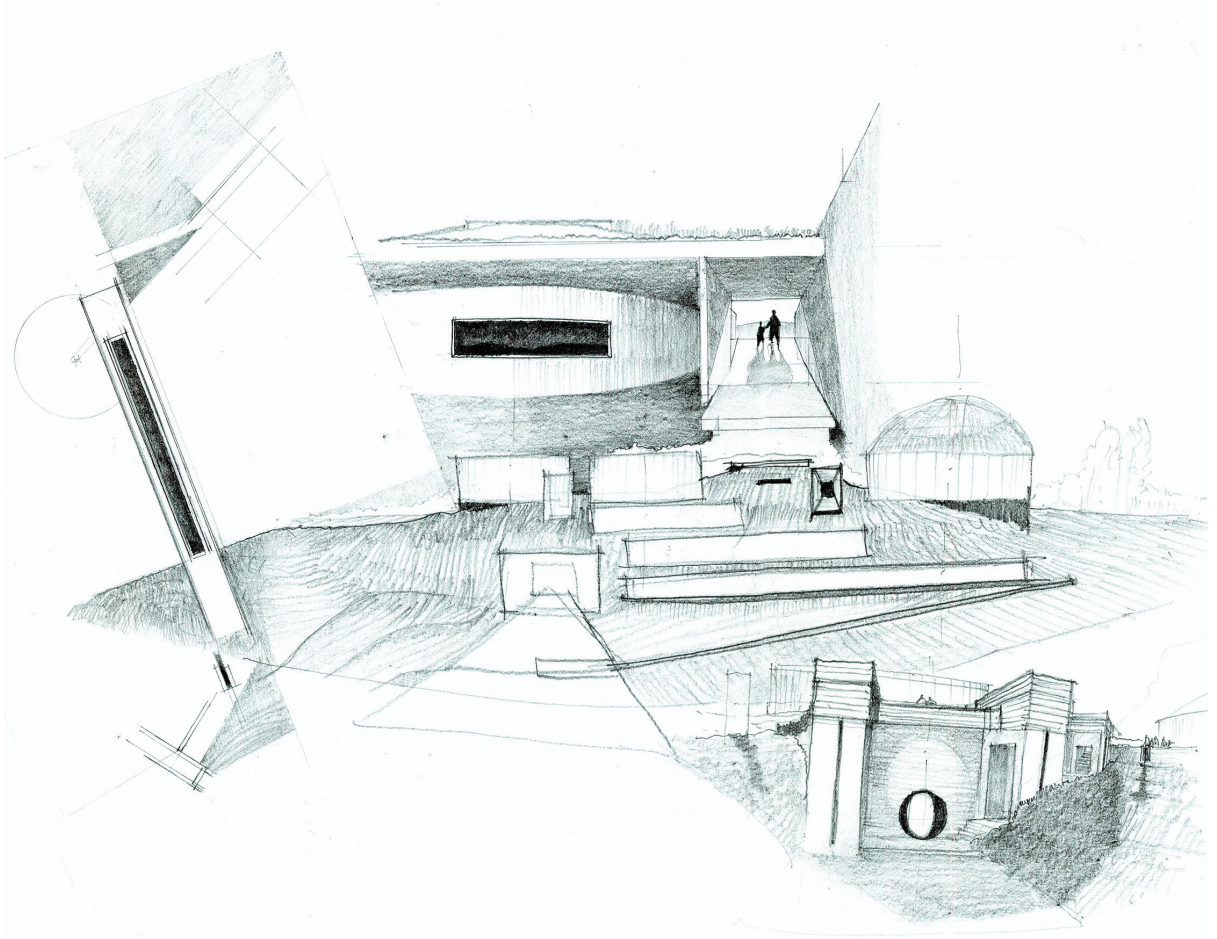
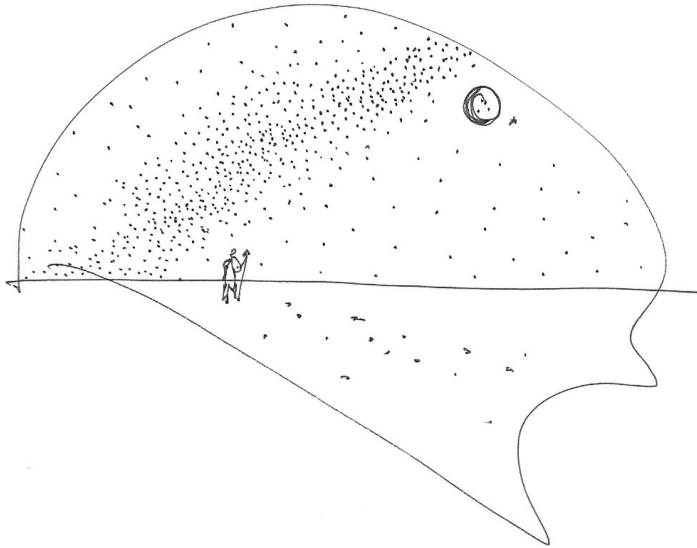


Fig.77. The environment gallery. Dedicated to the landscape, the outdoor rooms inspire curiosity and contemplation between the built forms. August, 2016.

## 5.1.1 PREMISE

*Myth*



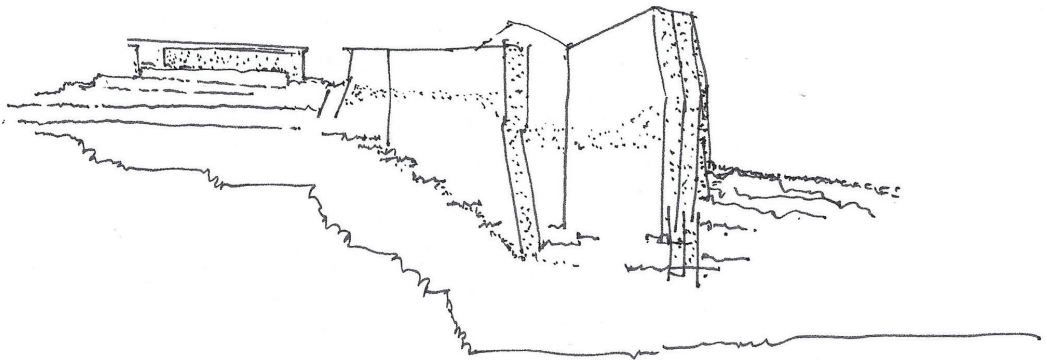
Inspired by Thebe Medupe's *Cosmic Africa*, the concept derives its intentions from an understanding of the relationship between two opposites. His exploration of myth and science reflects the overarching concept, *Borderland*, which ties the three volumes together.

Fig.78. Conceptual sketch. The fascination with the sky and landscape in which I exist. March, 2016.



## 5.1.2 CONCEPT

*Reason*



Attempting to reconcile the building and programme with the surrounding landscape, the architectural concept deals with an upward focused programme in an underground enclosure. Contesting the accepted norm in planetarium construction, the concept attempts to encourage curiosity in children by allowing them to engage with these borderlands.

Fig.79. The architectural translation of concept. Between the sky and landscape, the conceptual sketch imagines the building emerging from the ground like a rocky outcrop. August, 2016.

## 5.1.3 BORDERLANDS

### *Overlap*

A disconnected site cannot be revived with an individual building alone, hence the purpose of this scheme is to facilitate the necessary activity to draw local and foreign energy. In doing so the challenges identified in the form of

social and physical dichotomies can be addressed. The site acts as a platform for overlap between the below mentioned dichotomies; the building becomes the borderland.

Rural and urban  
Township and suburb  
Artificial and natural  
Mundane and extraordinary  
History and narrative  
Reason and myth  
Sky and earth



Fig.80. Definition of the outdoor room, emphasising the visual route. August, 2016.

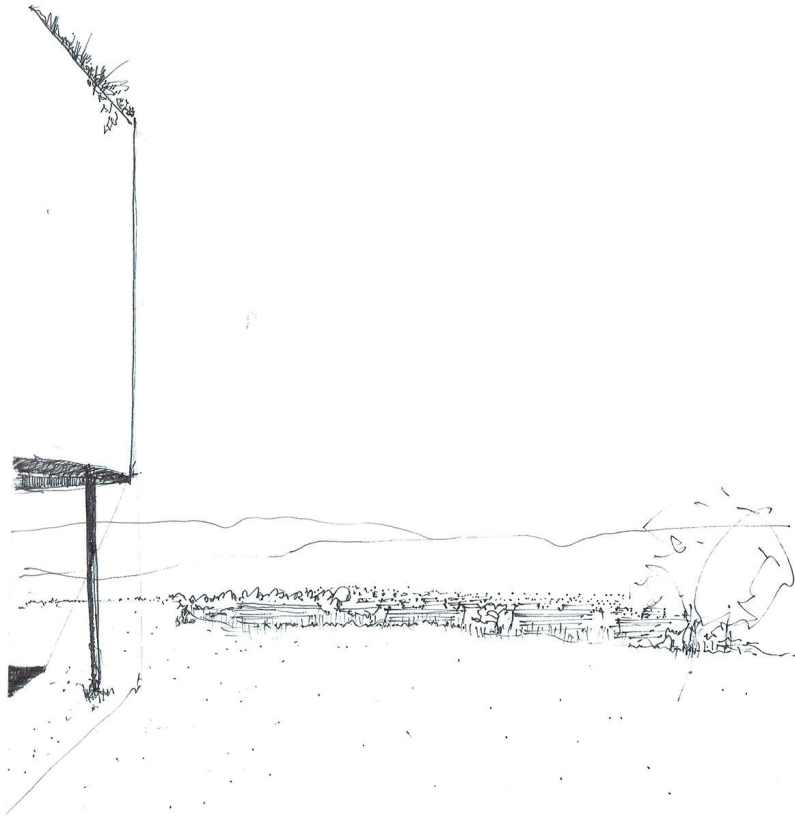


Fig.81. Responding to the landscape. Attempt to sensitise the architecture to not obstruct the view or interrupt the connection to the beyond. July, 2016.

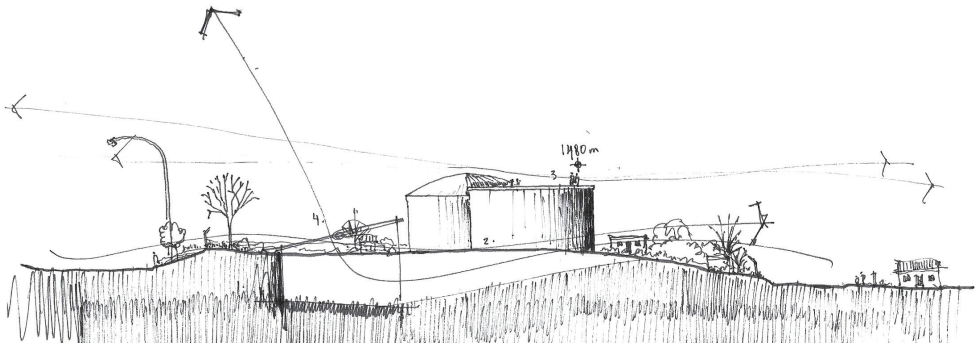


Fig.82. Disconnect. Removing the user from the surroundings in order to purposefully reveal them. April, 2016.

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## 5.2 UNLOCKING THE SITE

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*Uncovering myth*

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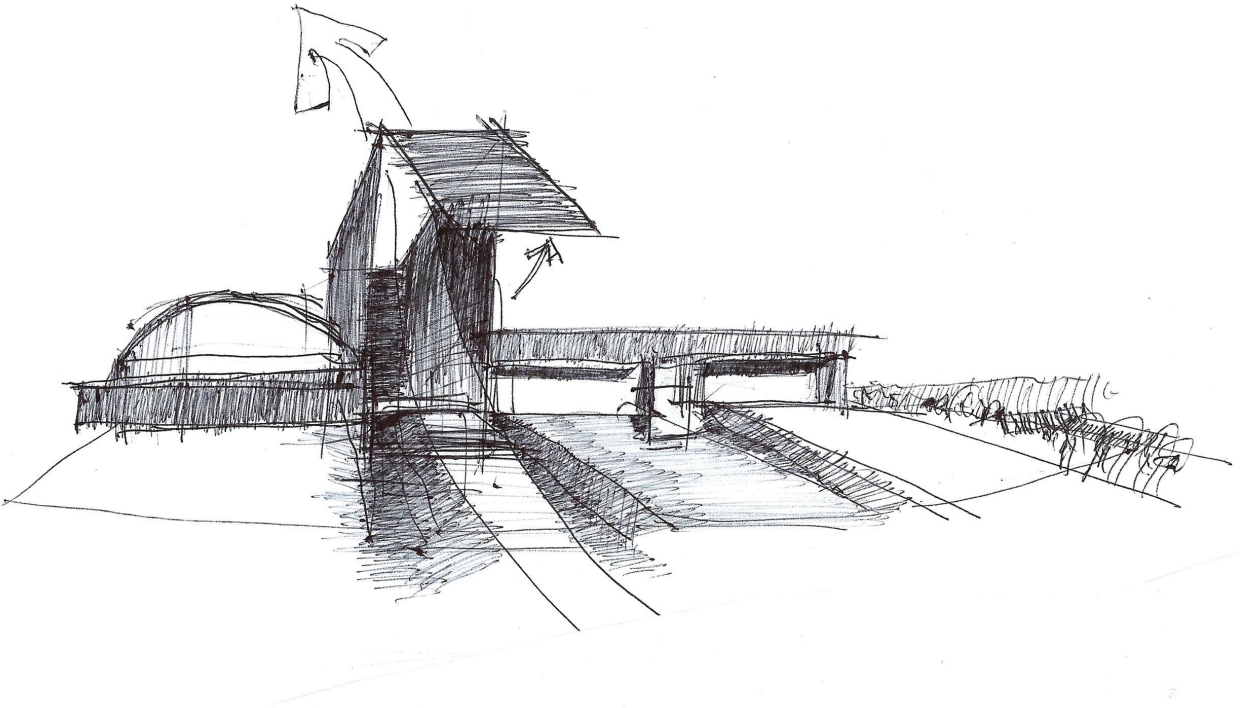


Fig.83. Unlocking the front door. Inviting residents of Tshwane to uncover the spirit of Atteridgeville.

**A** » *Suburban disconnect*

Inspired by *Tschumi's Parc de la Villette*, the idea of follies dispersed in the landscape was explored to complement the nature of surrounding context. This exploration was overlooked because it drew on the negative qualities of the suburban condition and proposes no resolution to the problem.

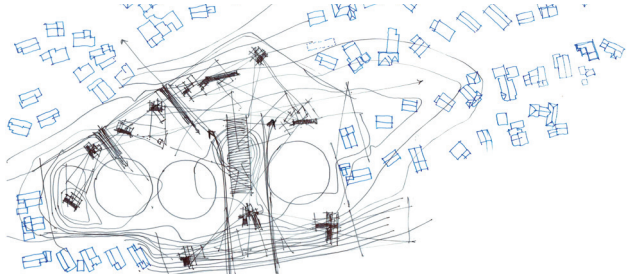


Fig.84. Decentralised follies. NTS. April, 2016.

**B** » *Boundaries + private property*

This exploration drew inspiration from the space contained within private property, using this notion to define space on site that would need to be contained by specific built forms. This configuration becomes problematic as the decentralisation of function requires each building to have its own service space, this would compromise the experiential quality of the site.

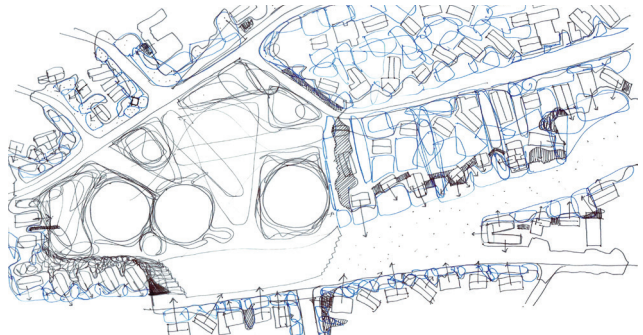


Fig.85. Spatial containers. NTS. April, 2016.

**C** » *First interaction*

A qualitative representation of possible collection areas. The north portion handles larger gatherings while the contemplative south shows useful pockets of space between the tanks and where trees provide shelter. Note how the east-west axis does not support collection due to the slope.

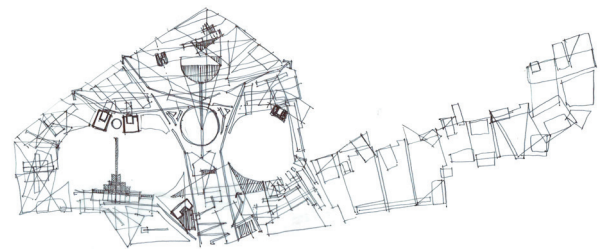


Fig.86. Collection space. NTS. April, 2016.

**D** » *Response to topography*

Drawing on the conclusions above, the final large scale exploration looked at creating an unfolded approach that positions itself around the existing tanks. In a manner to contain the site, welcome the street and provide passive surveillance along the east-west movement route.

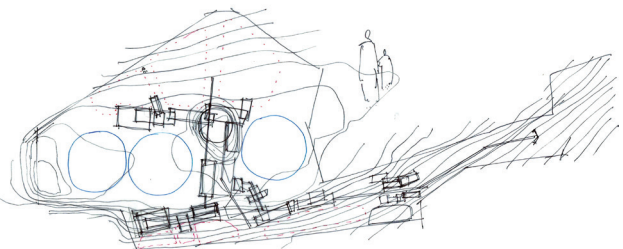


Fig.87. Plan without programme. NTS. April, 2016.

## 5.3 PROSPECT

*Curiosity and observation*



Fig.88. Gravititas. Accentuating the scale of the tanks through landscape manipulation.

The idea of prospect begins with the child spotting the large water tank on the hill upon approaching Atteridgeville. The destination on the hilltop creates anticipation and the child's mind can begin to wonder.

On arrival, the child can wander and explore the landscape, discovering the Lucas Moripe Stadium on the west, Pretoria CBD on the east and contemplate the number of houses in between.

Once the environment has been studied, the child begins to wonder: "*Where is the planetarium?*" The search for the planetarium takes the child down a series of ramps to a secret entrance. The speed and route explored by the child are determined by his/her own choice. The ramps offer another opportunity to interact whilst the stairs offer an alternative route. The reception and lobby provide the child with a chance to settle down before entering the planetarium.

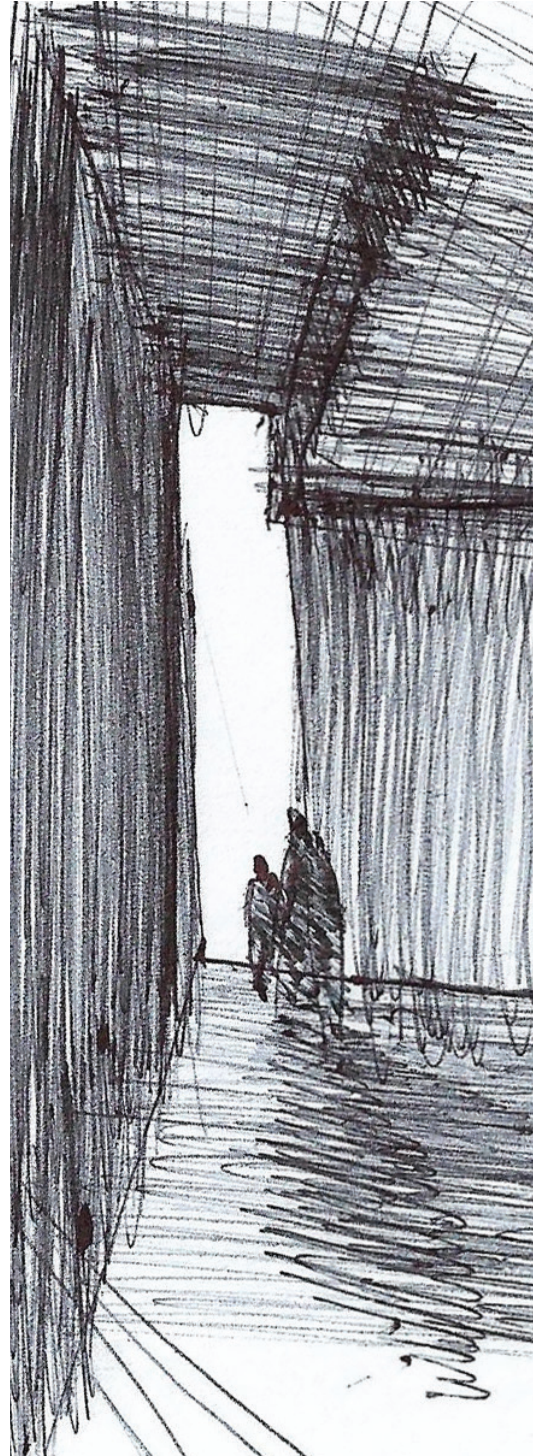
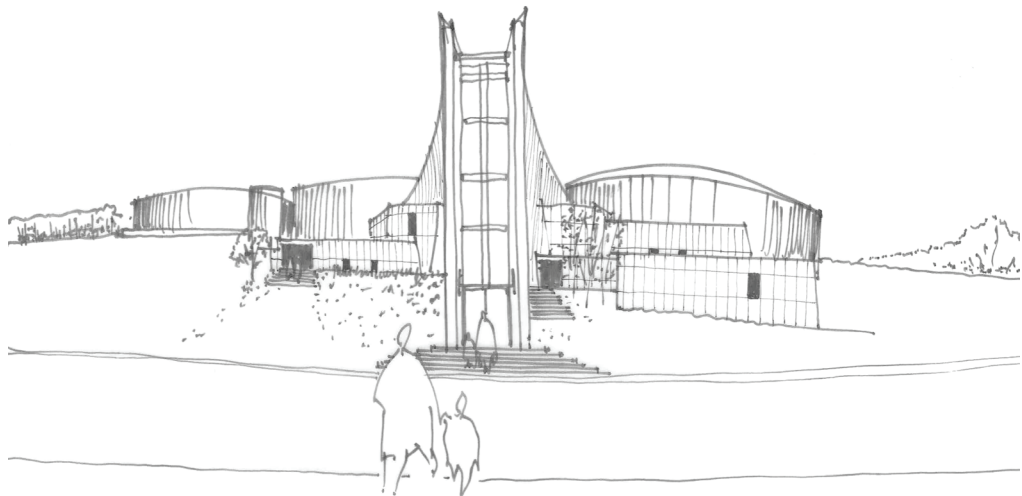
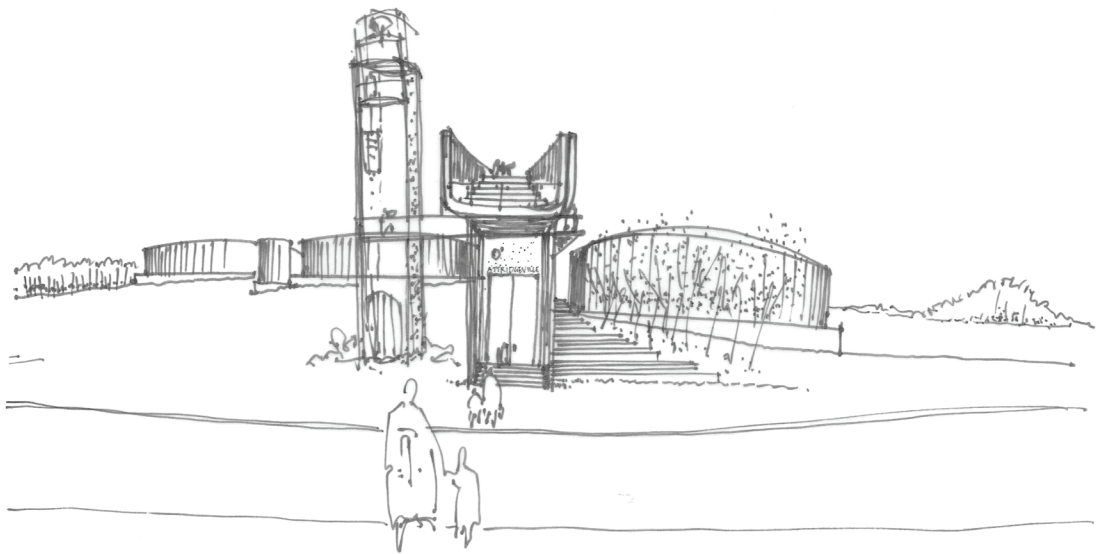
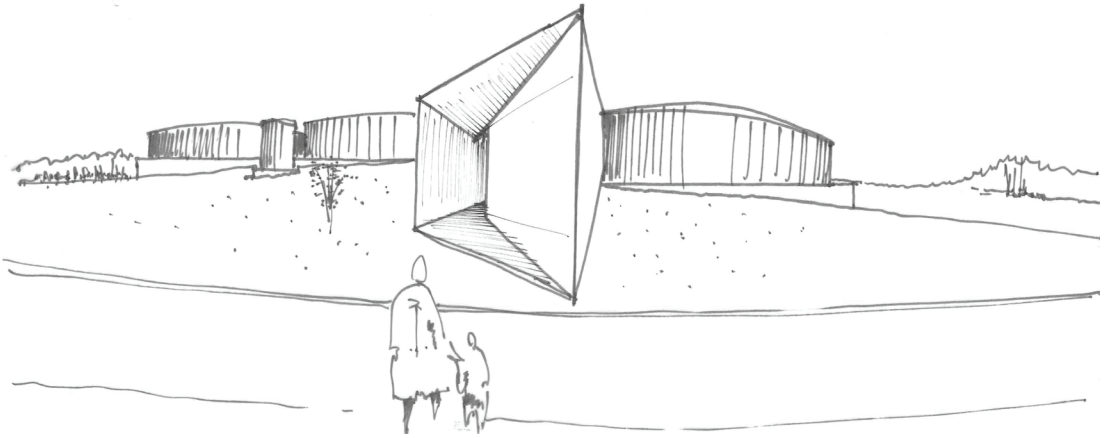
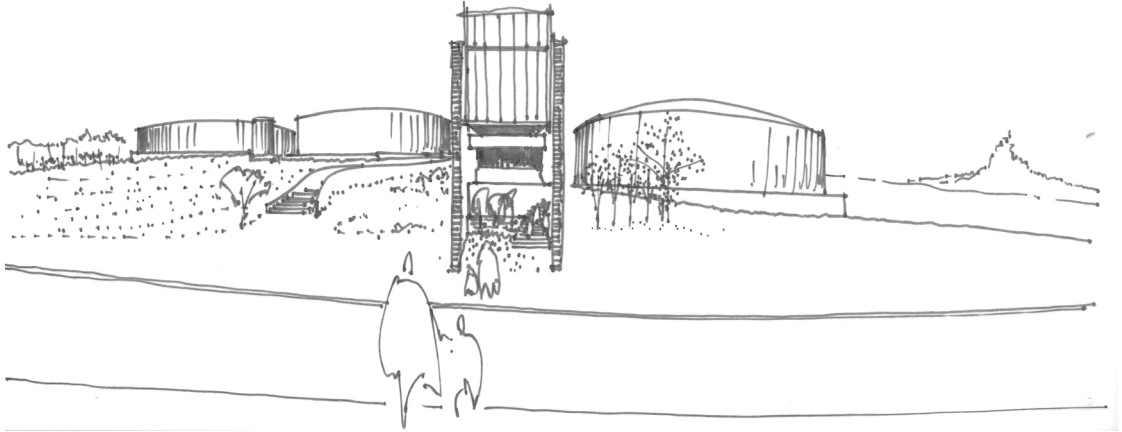


Fig.89. Delayed gratification. Inspiring the beyond.





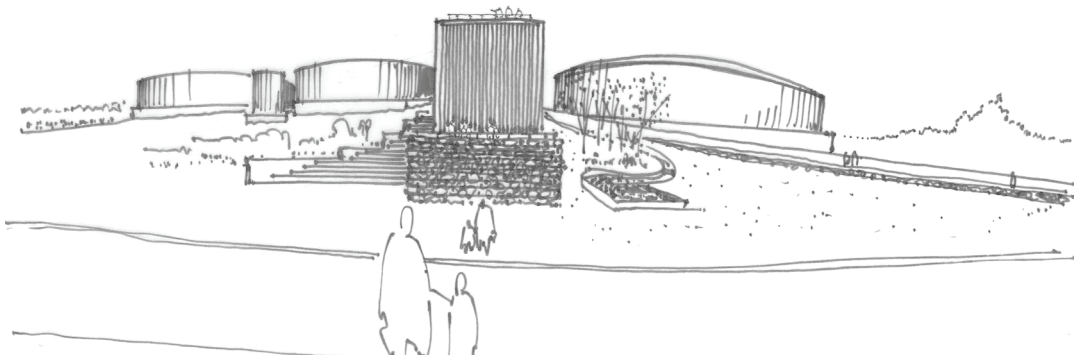


## 5.4 DEVELOPMENT

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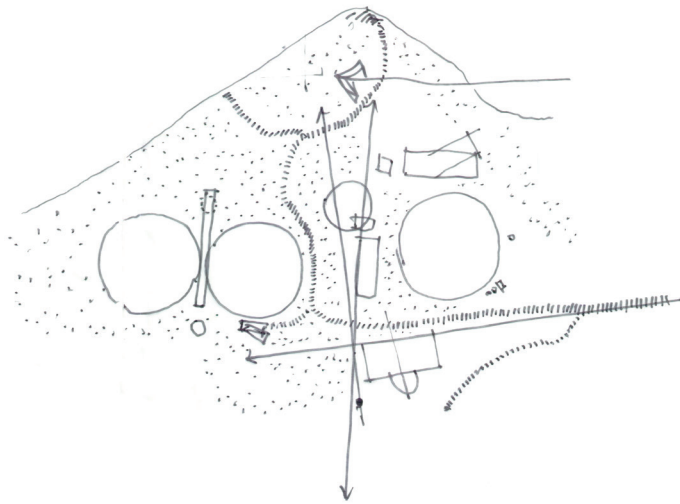
### *The front door*

Layering intention onto a two dimensional drawing allows for the exploration of scale, reach, spread and approach. The exploration of the front door was specifically used to determine an appropriate architectural language for the site. The front door experiment enabled the designer to determine a movement axis and a visual route. Although this two dimensional exploration did not intend on addressing these issues, the outcome became a pleasant surprise, Figures 90 and 91.

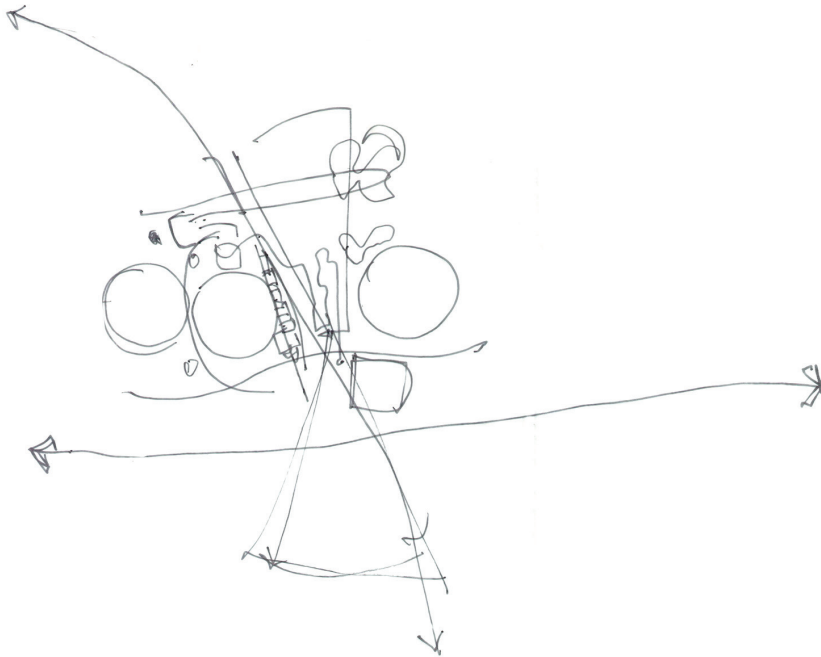


## 5.5 THE DIAGRAM

*Synthesis of exploration*



**Fig.90.** The movement route. July, 2016.  
Understanding the movement route enables the design to unfold between the landscape and the water reservoirs. Highlighting destinations and promoting passive surveillance. These routes encourage the placement of buildings and organisation of the regroup spaces, allowing visitors to explore and gather at wish.



**Fig.91.** The visual route. July, 2016.  
The visual route encourages contemplation and offers a scenic route for the local resident or a platform of observation for the visitor. The demarcation of these routes are fundamental to the design as they dictate the positioning of the buildings to prevent obstruction.

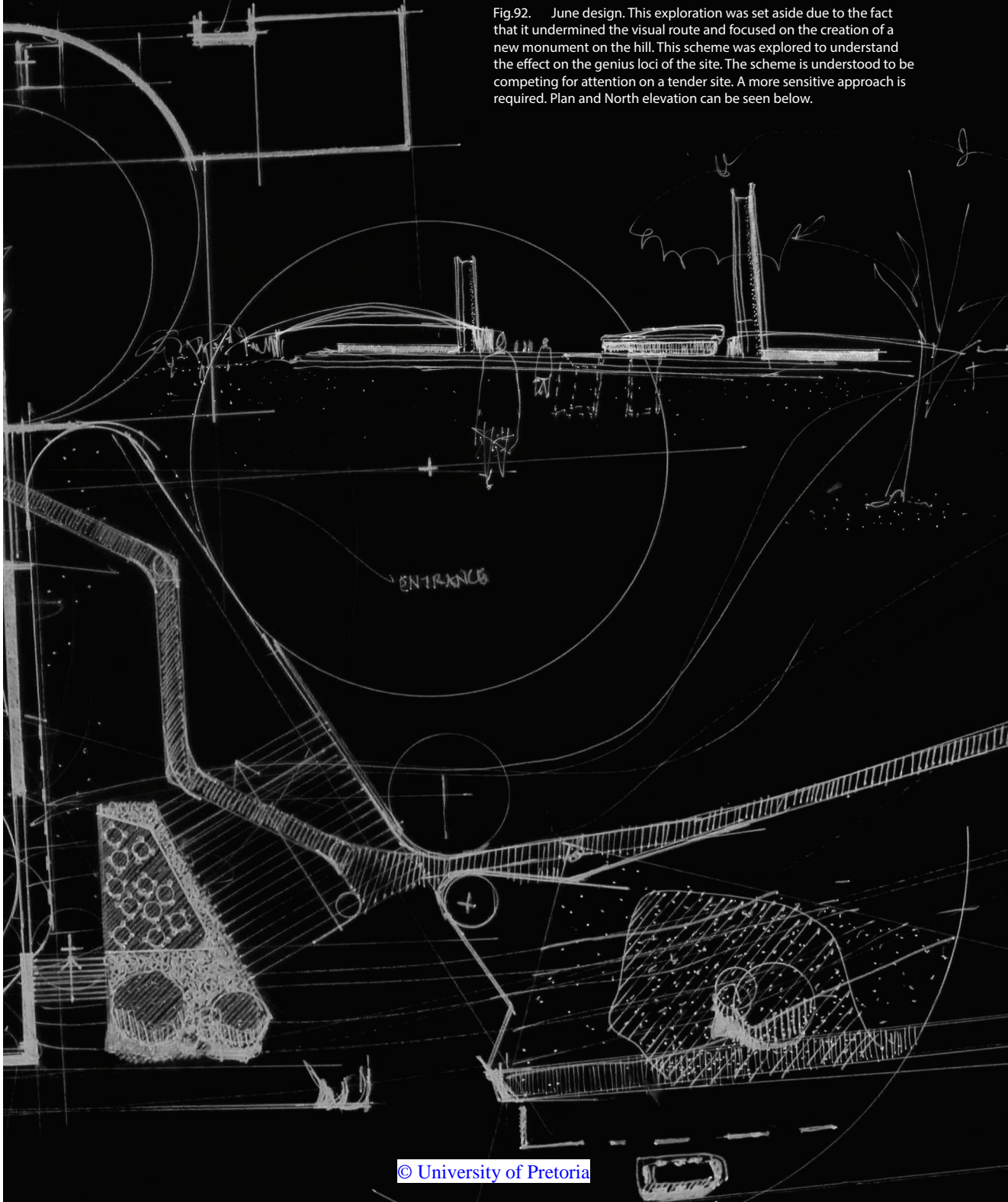
# 06 DESIGN

*Drawing the building*

TRAMING

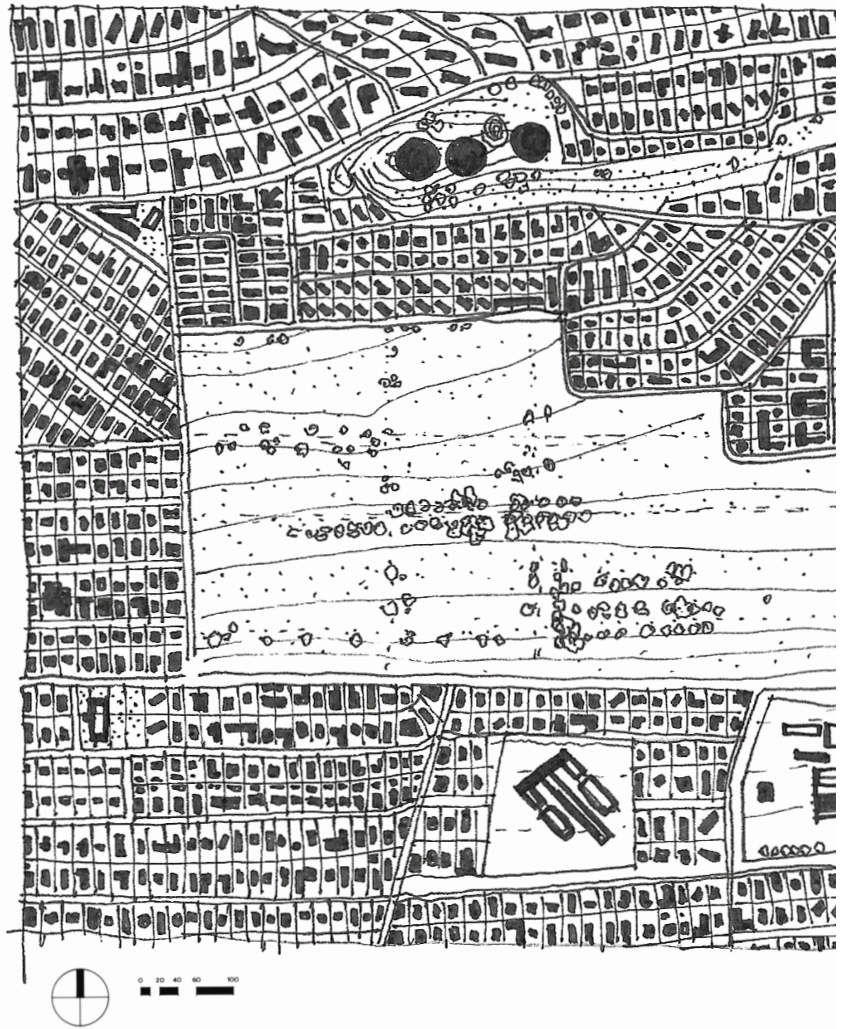


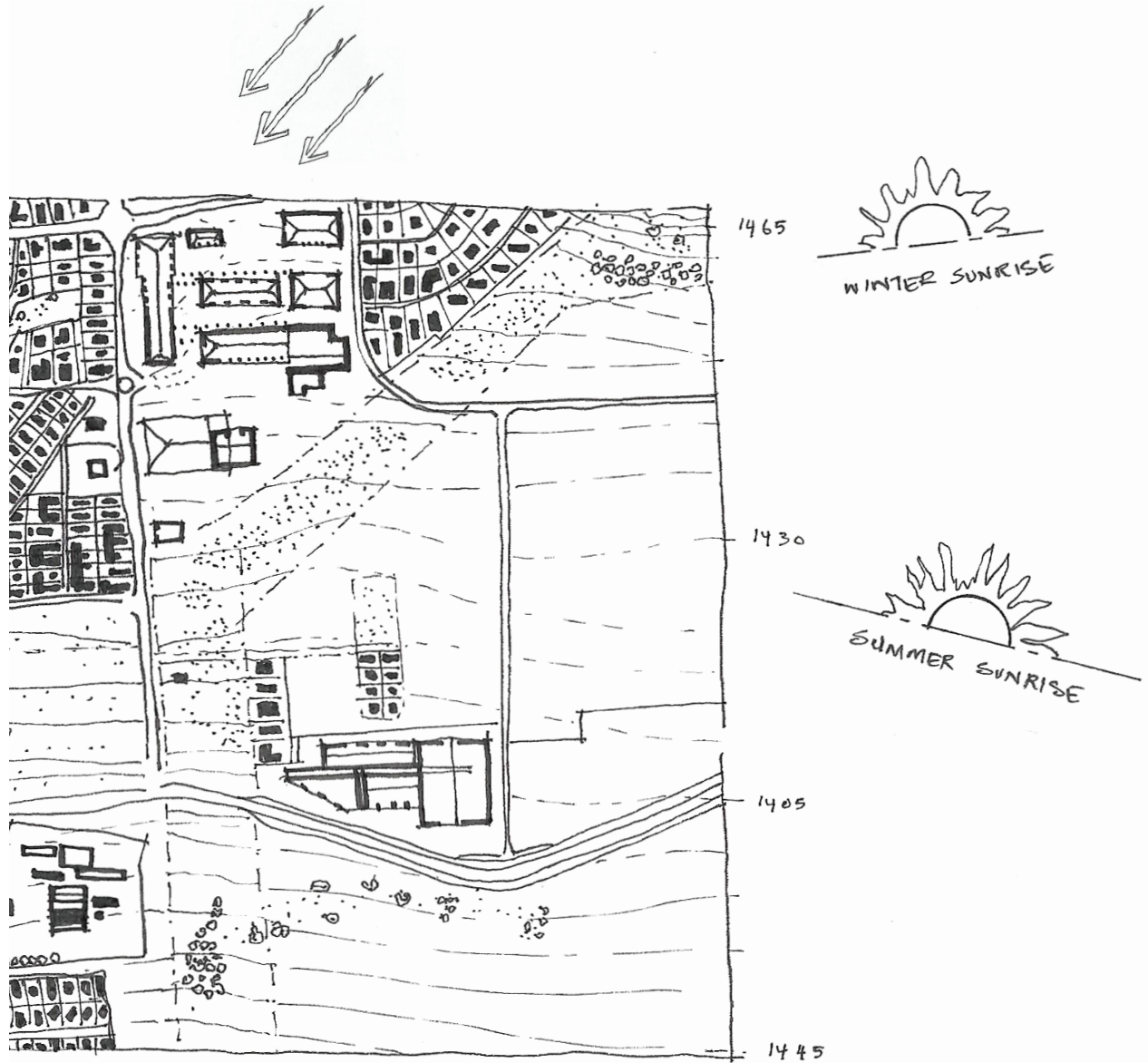
Fig.92. June design. This exploration was set aside due to the fact that it undermined the visual route and focused on the creation of a new monument on the hill. This scheme was explored to understand the effect on the genius loci of the site. The scheme is understood to be competing for attention on a tender site. A more sensitive approach is required. Plan and North elevation can be seen below.



# 6 CLIMATOGRAPHIC STUDY

*The breeze and the shadow*





One of the fundamental constituents of the qualities identified on the site is the effects of climatic conditions. Using these conditions to improve the quality of the proposal, the scheme attempts to capitalise on the fresh breeze and provide shaded gathering places to shelter from the harsh sun. In the rainy season, in stead of shying away from the storm provision is made to protect against it.

## 6.1 THE BOUNDARY

### *Borderlands*

The presence of the *positive* platonic tanks on the man-made plateau calls for a site sensitive architectural response. The design process searches for the *negative* in order to provide a sensitising architecture. Blurring the boundary between the *room* and the *garden*.







Fig.93. A room and a garden.

Inspired by Louis Kahn's phrase on his approach to architecture and landscape; simply classifying them as a room and a garden. The project aims to encapsulate this harmony in the connection between the outdoor and indoor spaces.

## 6.1.1 RUIN THE SITE

*Testing the flexibility of the site*

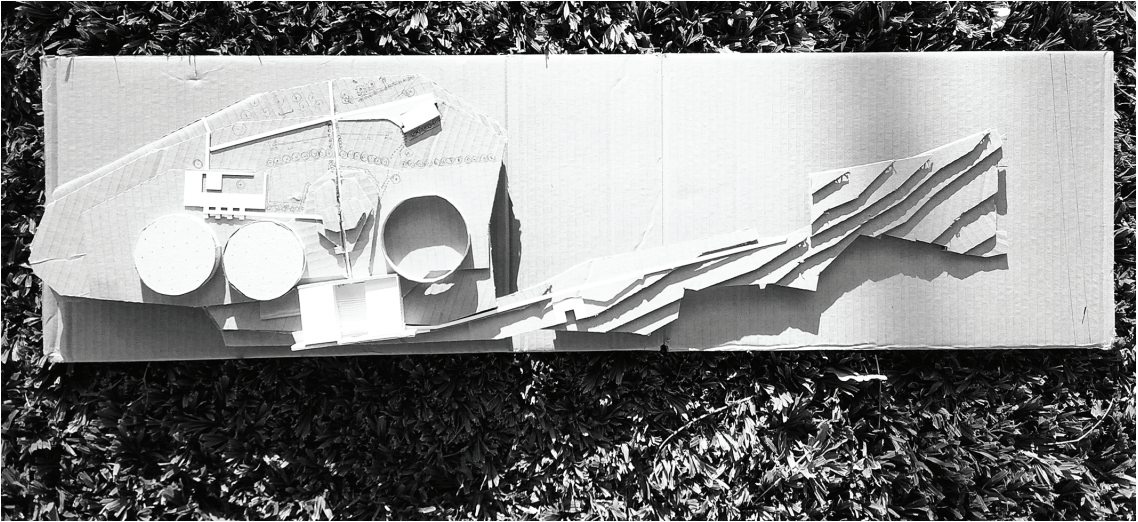
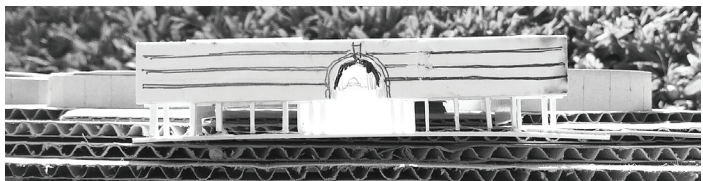
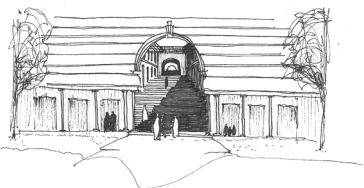
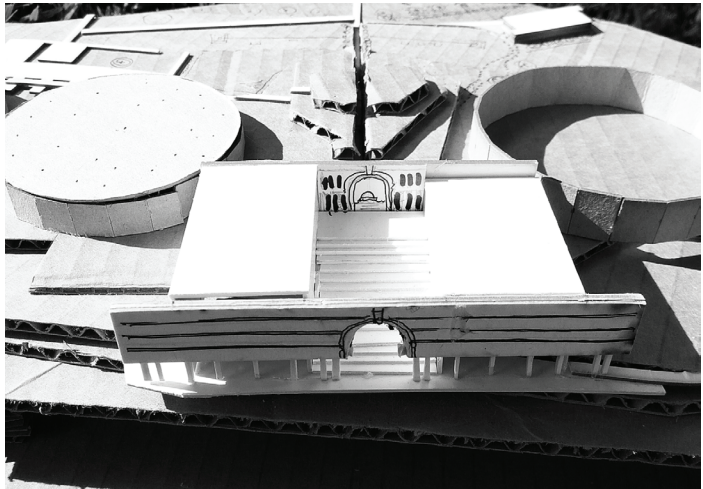


Fig.94. Ruin the site. March, 2016.

This early exploration tested the flexibility of the site. Imposing a classical order to the approach and scale of the project, the model aimed to ruin the site in order to draw conclusions. The choice was made to place the planetarium in the disused tank in the centre of the plateau, with supporting offices and youth workshop spaces on either flank of the colossal staircase.

To the north of the site, a shuttle drop off and a reception would welcome guests on arrival from Thindisa street. This decision however compromises the park and would otherwise not provide Atteridgeville residents with a reclaimed park space. The exploration also revealed that the scale of the supporting structures outweighed the main function of the proposal, namely the planetarium. Furthermore the rigidity of the classical facade competed for attention with the water tanks.



## 6.1.2 ABOVE GROUND

*Responding to the cylinders*

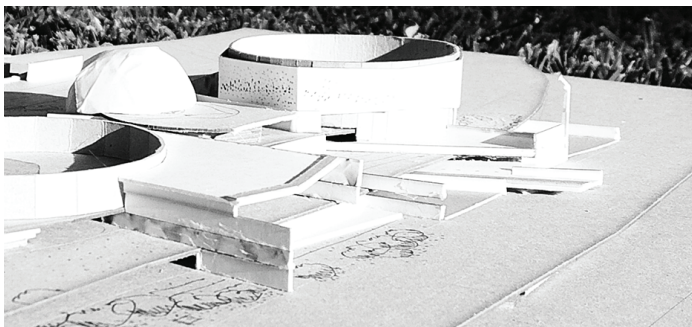


Fig.95. Above ground, April, 2016.

This exercise made use of the horizontal plane to create new platforms for engagement. Designed to include a graduation ceremony space on the southern platform, this cross pollination of programmes encourages the use of the park beyond the visit of the planetarium. This was done to ensure that the planetarium does not become isolated or disjointed from its fabric, as seen in the Johannesburg Planetarium during public holidays.

This scheme also introduced a new skin which would resurface the 20MI tank on the east. This was done to mask the large tank and accentuate the presence of the tank during the evening hours. Finally, the shuttle drop-off placed on the north would be off centre such that the park could remain operational.

The attachment to the existing tank proved problematic, with little consideration to the geometry of the cylinder. It also proved to erase the tank instead of reveal it or highlight the significance of fresh water reservoirs.



### 6.1.3 THE TUNNEL

*Connecting the functions underground*

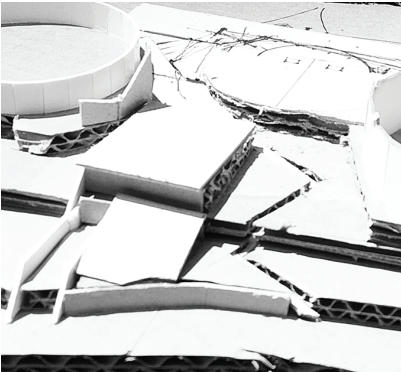
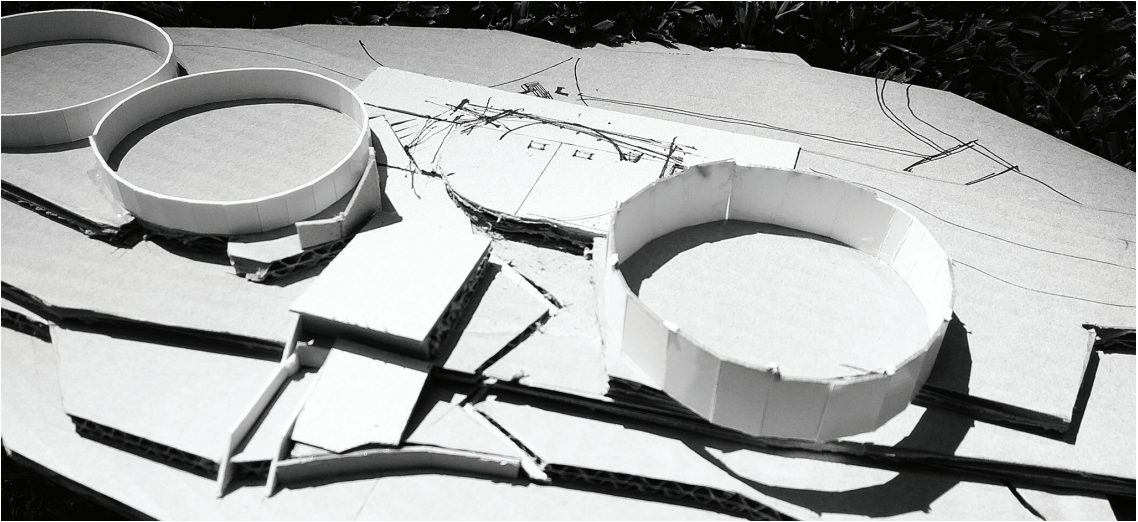


Fig.96. The tunnel. May, 2016.

Searching for a completely different approach, this model explored the gradient of the ramps necessary to bridge the embankment on the south and positioned the enclosures along the route. This positioning impeded on the natural amphitheatre which was created between the tanks. The plan and north elevation were highlighted on the cover spread of Chapter 6.

## 6.1.4 RECEPTION

*“Makbukhu”*

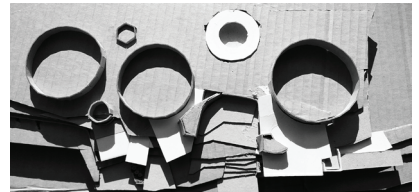
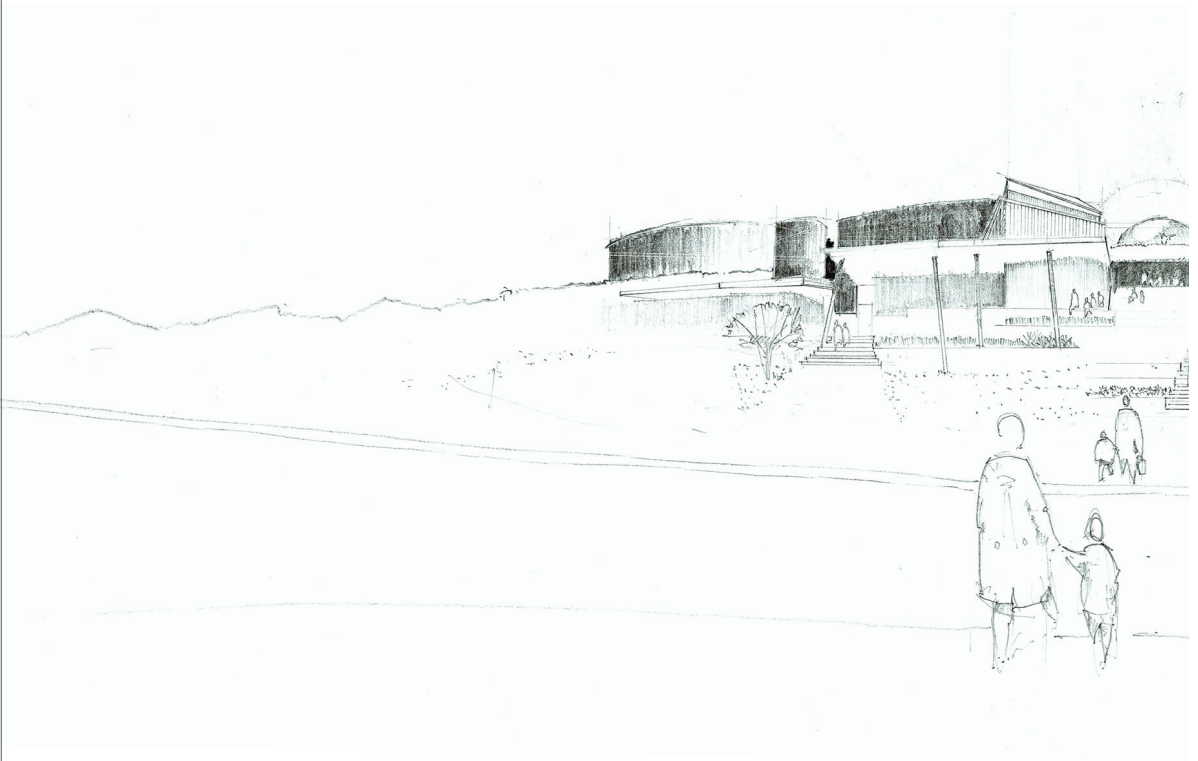
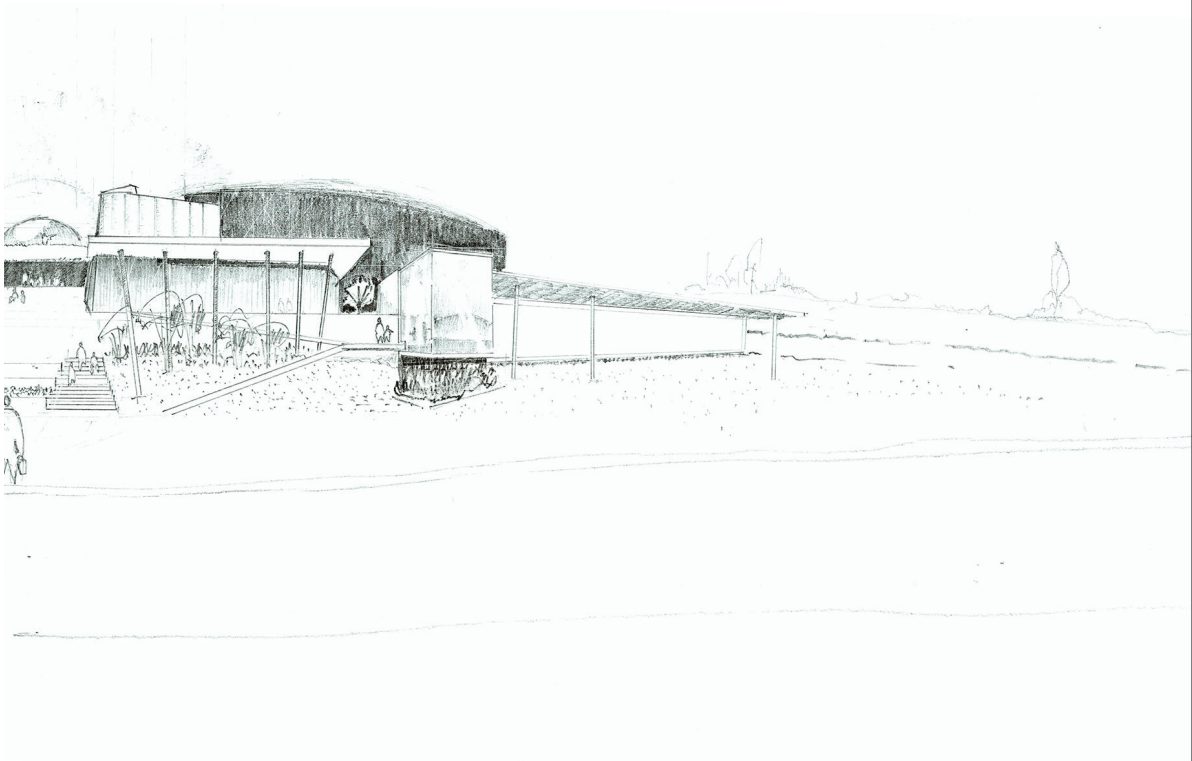


Fig.97. Urban reception. June, 2016.

This exercise was developed for the June examinations. Upon designing the elevation, the decision was made to set this scheme aside due to the architectural language, which resulted extracted from the model. The fragmented roof planes called for lighter roof materials which resembled the ‘shack typology,’ which this dissertation aims to find an alternative for. This iteration resulted in an understanding of the southern conditions of the site, and a reinterpretation of the horizontal plane.





**Fig.98.** Makhukhu. This iteration was set aside as it perpetuates the notion of romanticised poverty. The planetarium is clad with an architectural language of circumstance, which is so often seen as *fit for township architecture*. The placement of glass and light-weight steel columns masks the reality that this language is what is being challenged. Similar to any commercial hub development in townships, this architectural language is seen to promote the apartheid spacial legacy. June, 2016.

## 6.2 THE TERRACE

### *Synthesis of exploration*

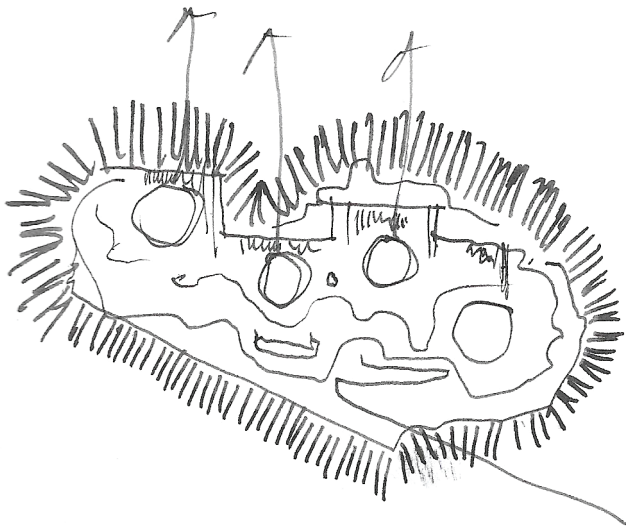


Fig.99. The table cloth. The large plateau is represented as a table cloth, the largest outdoor room allows for views outward. Adapted from a plan of the acropolis. July, 2016.

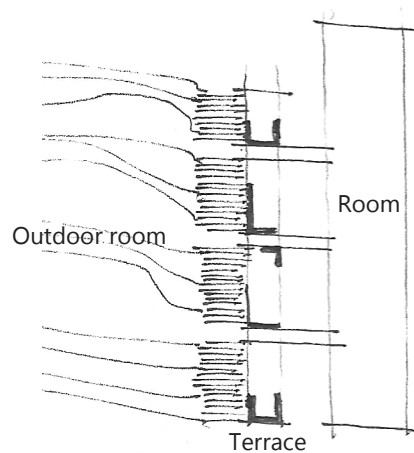


Fig.100. The outdoor room. A sequence of thresholds that balances the garden and room. July, 2016.

The threshold evolves into a series of spaces, with the building forming the background, an intermediary terrace which bridges the building and the landscape, labelled the outdoor room. This sequencing allows for the building to be set into the background allowing the terraces to become spaces of gathering and collection.

The outdoor rooms become platforms for engagement, usually highlighting a prominent view or a connection beyond, while the terraces prepare the user to approach and enter the building.



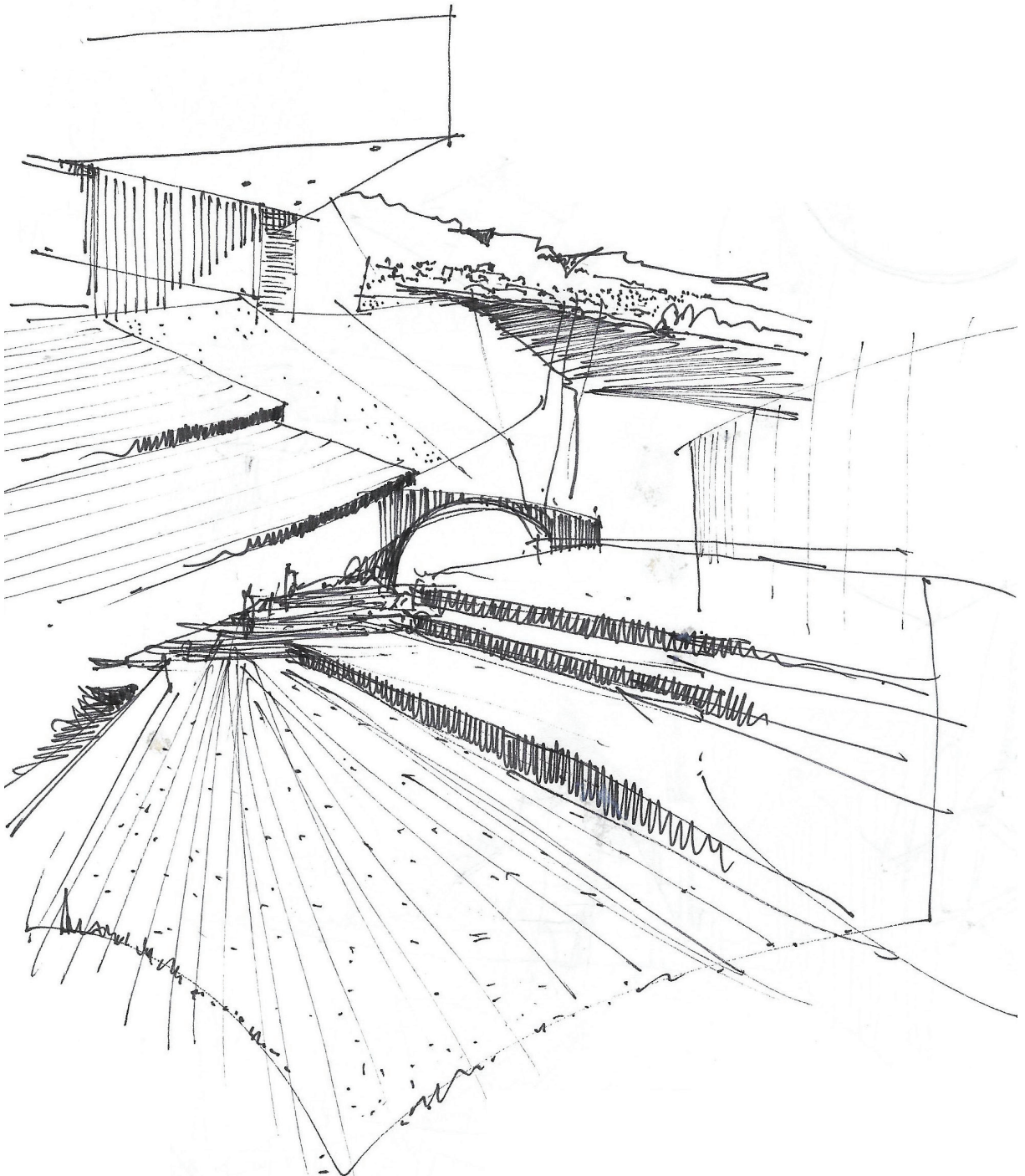
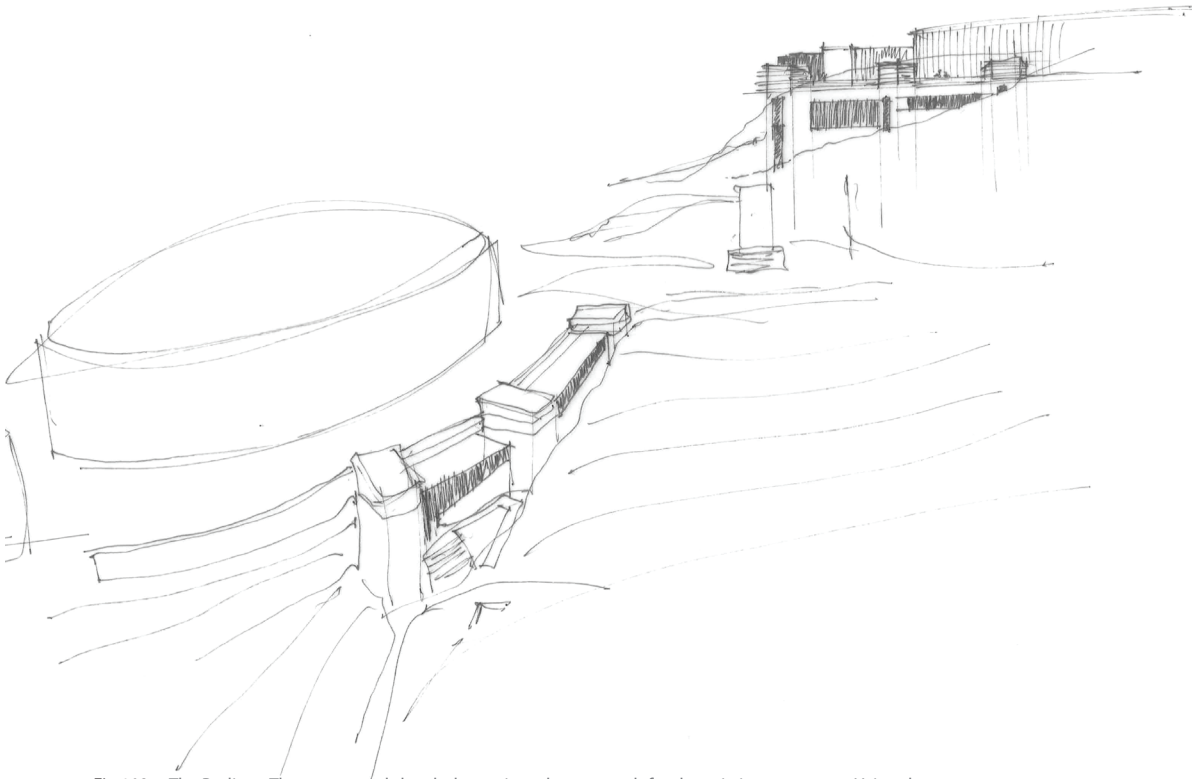


Fig.101. The terrace. Leading to the programme container, the terrace helps to guide regroup children before they enter into the building. July, 2016.

## 6.3 THE NEW PODIUM

### *Nature of municipal infrastructure*

In an attempt to sensitise municipal infrastructure the architectural intention is to mediate between the residential surrounds and the disconnected site, highlighting the importance of the safekeeping of water. Taking precedent from *Colectivo 720's Articulated Site*, the project aims to reclaim usable space around municipal infrastructure and highlight its significance in urban cores.



**Fig.102.** The Podium. The conceptual sketch determines the approach for the existing structures. Using the new architecture to emphasise the existing tanks, *the podium* redefines the southern facade mediating between the street and the plateau. July, 2016.

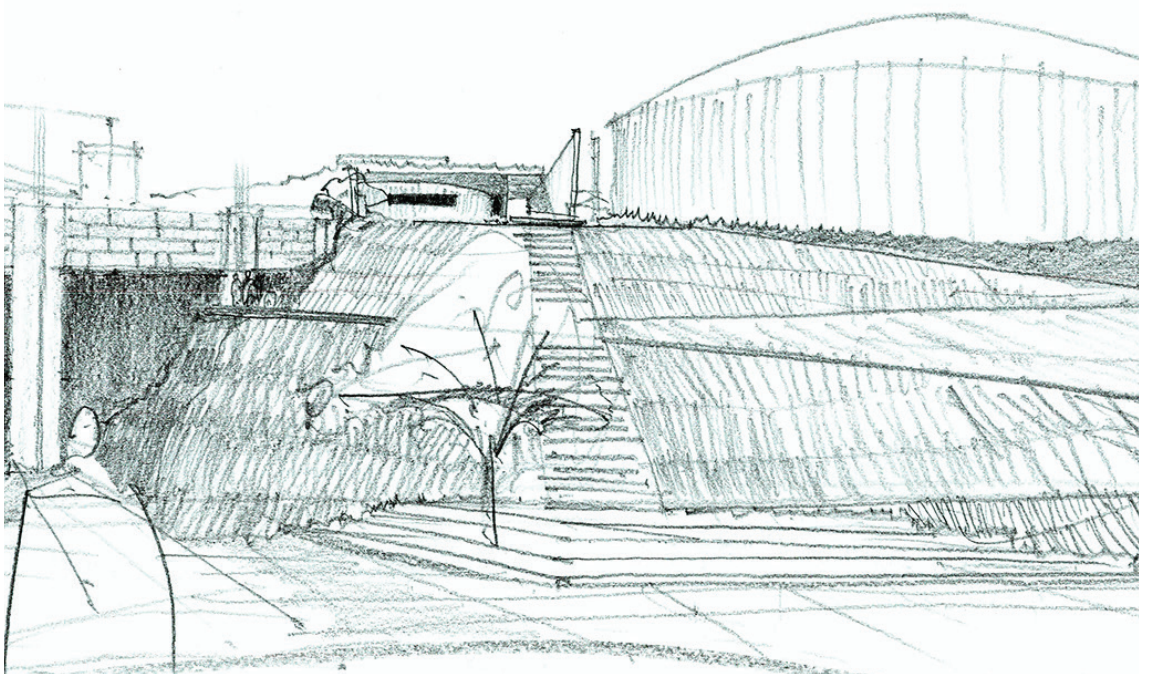
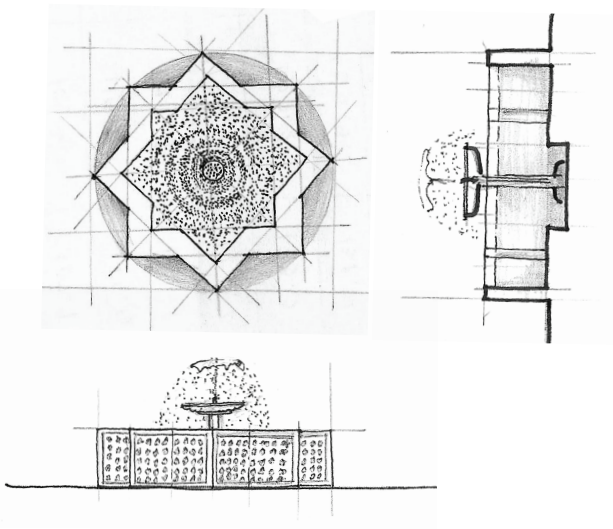


Fig.104. Ascension. The provision of a public staircase emphasises prospect and draws the user between the tanks. As one begins his journey, the gravitas of the tanks is felt and the significance of the safekeeping of water is accentuated. Once on the podium a large wall disconnects the user from the surroundings only to reveal the Magaliesburg mountain range on the north. August, 2016.

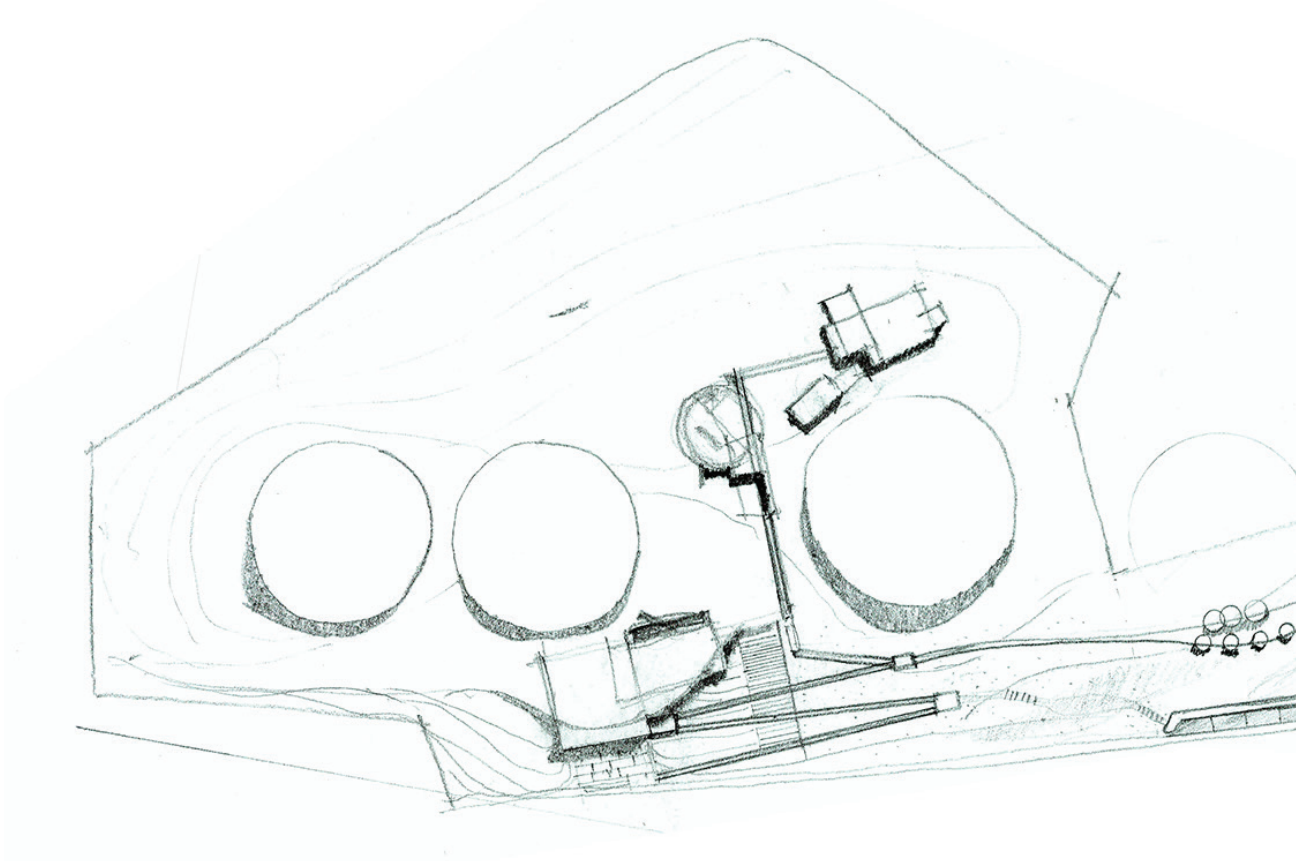


The merger of programme and site will focus on accentuating the significance of water provision to urban cores. Highlighting the importance of water in daily activities and demonstrating how water can be *conserved*. The theme of learning and exploring will be aided by the steep topography and the presence of the large reservoirs to generate curiosity on site.

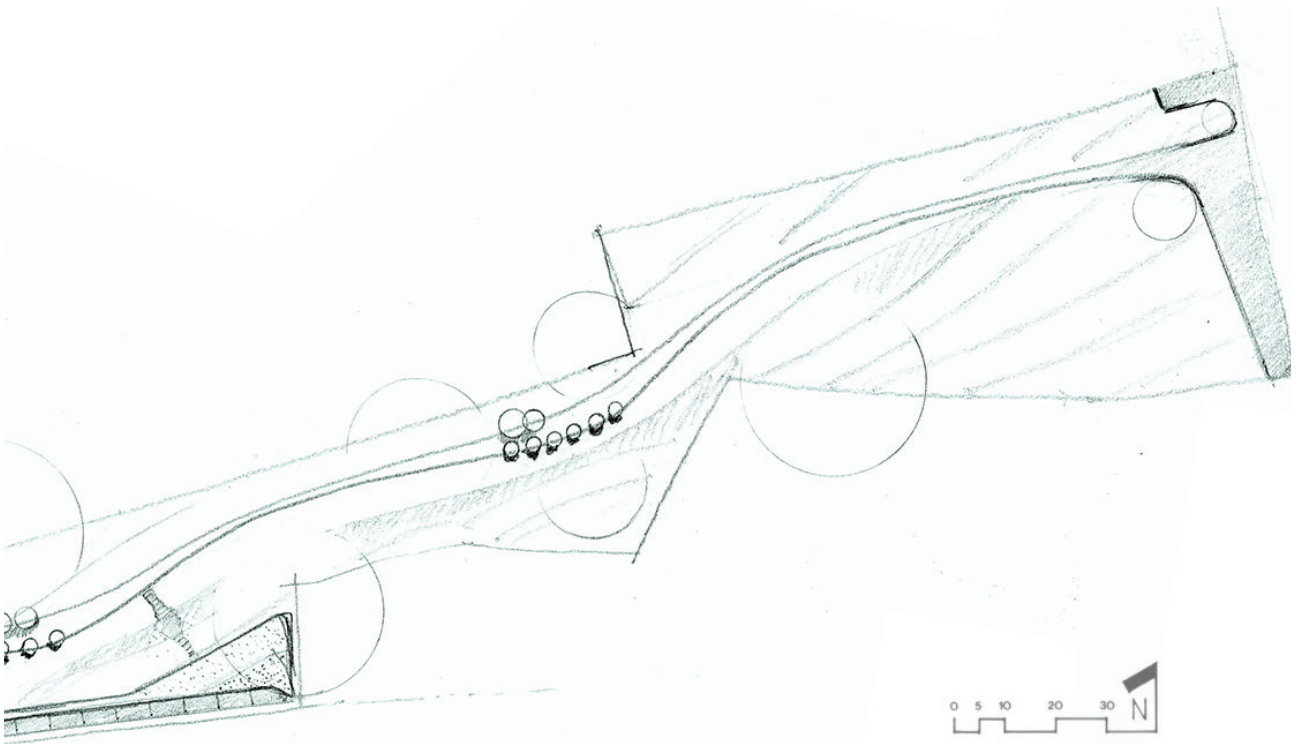
Fig.103. The Moroccan fountain, typically found in the centre of a residential courtyard, demonstrates how a domestic necessity has evolved to become animated. This animation does not override or deteriorate the functional integrity of the fountain. It beautifully accentuates the use of water as a part of the daily ritual.

## 6.4 THE MASTER PLAN

*Merging intentions and contours*



**Fig.105.** The Master Plan. Illustrated above, the synthesis of space design culminates in a large scale drawing, the master plan. The green island is shown under the new design; the terraces, urban balconies, rooms and gardens are shown in relationship to one another. August, 2016.

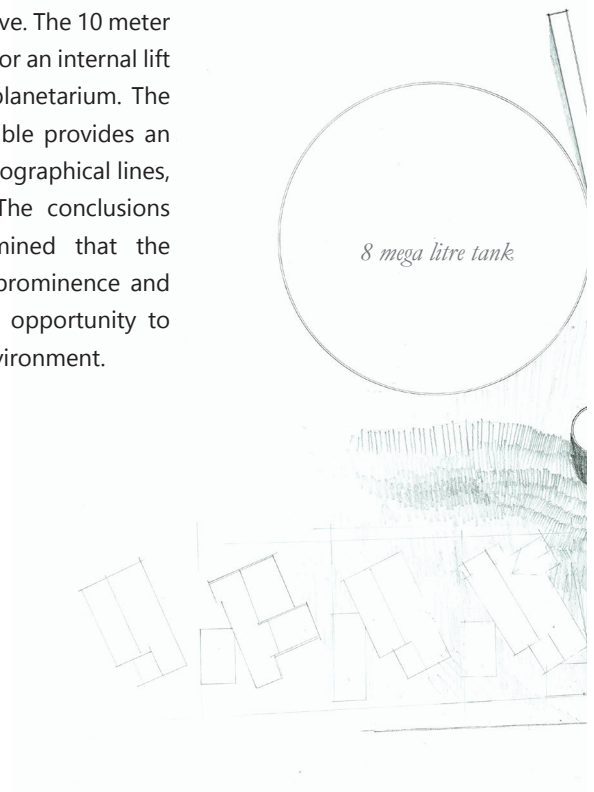


Nestled between the existing tanks, the architectural language evolves from an underground enclosure (the Planetarium) to the modern cave in the centre of the plateau (The Environment Gallery), finally the architecture emerges on the north with the Restaurant to activate the neighbourhood park.

## 6.5 THE ROOF PLAN

*Between the room and the garden*

The development following this roof plan considers a larger accessible reception on the southern facade. The offices and storage house golf carts that would transport disabled users from the lowest level to the plateau above. The 10 meter elevation is bridged via the ramps or an internal lift accessible to the visitors of the planetarium. The decision to make the site accessible provides an opportunity to accentuate the topographical lines, and design a public staircase. The conclusions based on this iteration determined that the staircase should be given more prominence and made wider to give the user an opportunity to pause, and reconnect with the environment.



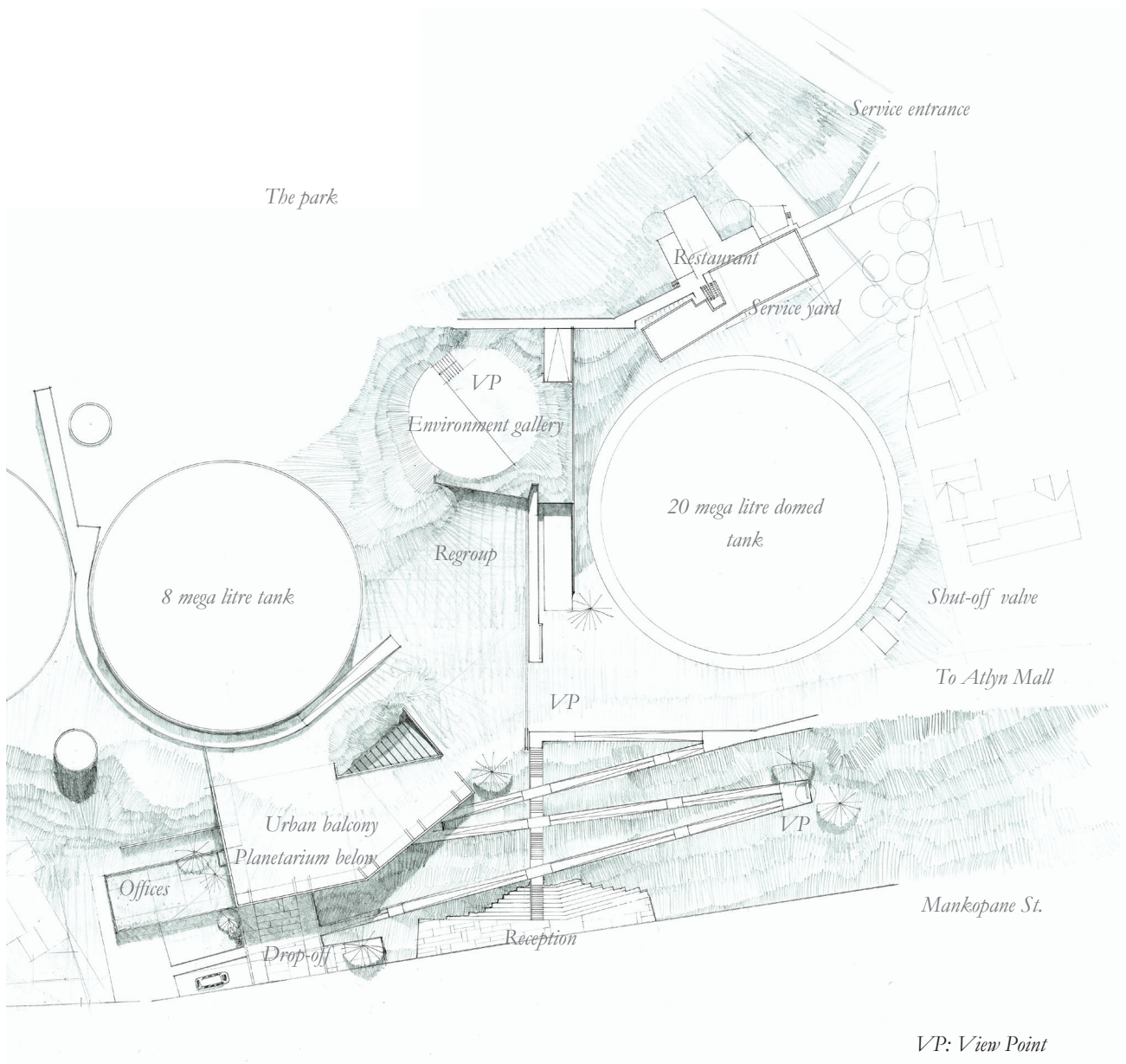


Fig.106. The roof plan. The circulation routes zigzag through the landscape providing moments of pause for the user. For the child these points become opportunities to meander off the route and interact with the natural topography. NTS. September, 2016.

## 6.5.1 THE RESTAURANT

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*Defining the park*

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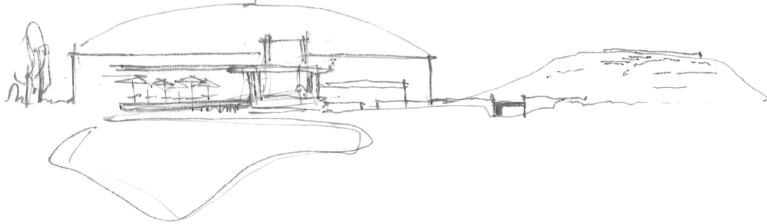
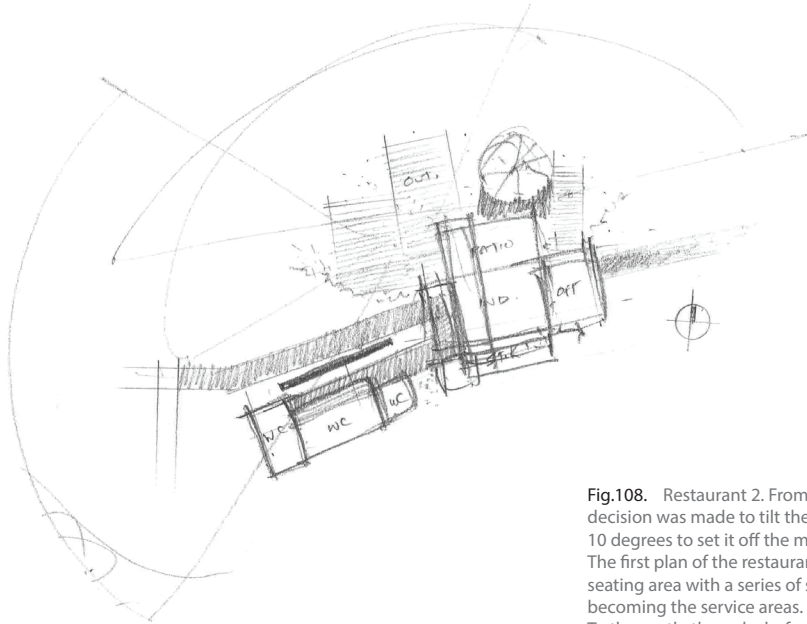


Fig.107. Restaurant 1. First attempt at designing the restaurant elevation, the intention is to mediate between the surrounding residential scale, the undulating topography of the site and finally the 20MI domed reservoir. July, 2016.

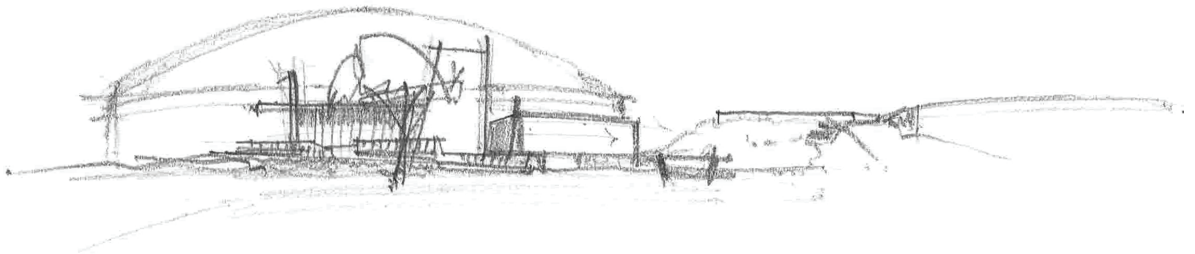
From the highest point on the north portion of the park, the seated restaurant fulfils two purposes. The first to contain the site and overlook the park, where children are freely playing. Secondly, the restaurant aims to bridge the scale of the gigantic tank, mediating between the concrete structure and the gentle dome above.

The ablution block is tilted off the main axis to not compete with the restaurant's presence and to lead the approachers eye towards the environment gallery.





**Fig.108.** Restaurant 2. From the elevation, the decision was made to tilt the ablution block by 10 degrees to set it off the main approach axis. The first plan of the restaurant shows a main seating area with a series of smaller attachments becoming the service areas. To the north, three decks form the outside seating, overlooking the park the decks allow for various levels of intimacy. July, 2016.



**Fig.109.** Restaurant 3. The perspective reflects the intentions of the plan and explores the volumetric mass of the restaurant's entrance. July, 2016.

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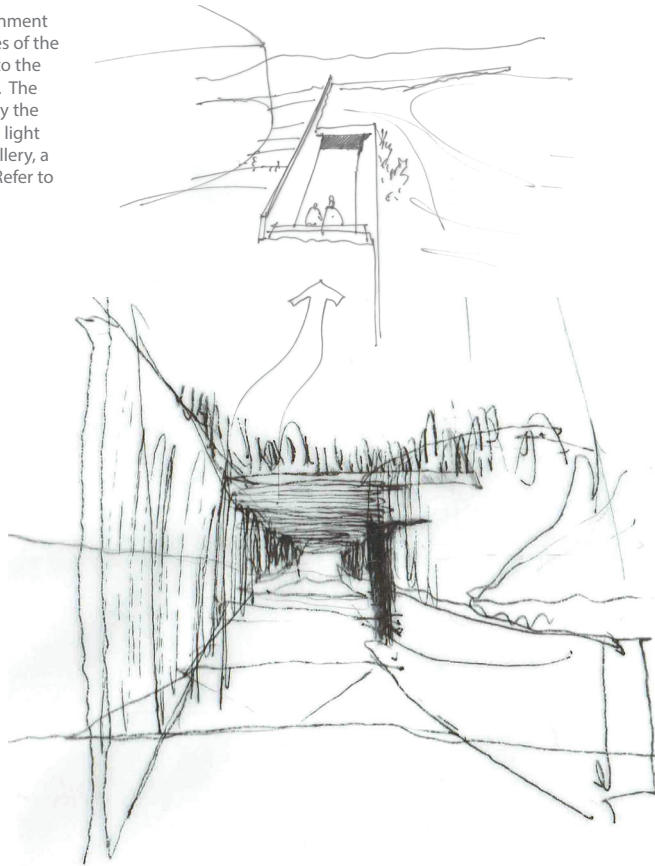
## 6.5.2 THE ENVIRONMENT GALLERY

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*Concentrating the view*

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**Fig.110.** The Environment Gallery. Early sketches of the threshold leading into the Environment Gallery. The light lobby created by the tunnel maintains the light quality within the gallery, a mystical play room. Refer to Interlude.



Inspired by the kumkummi the Environment Gallery makes use of story telling and play to teach children. The presence of water creates a playful environment for the children and a look out point for the elders. Contained within the disused 19m diameter tank the large indoor room becomes a storm watching platform.

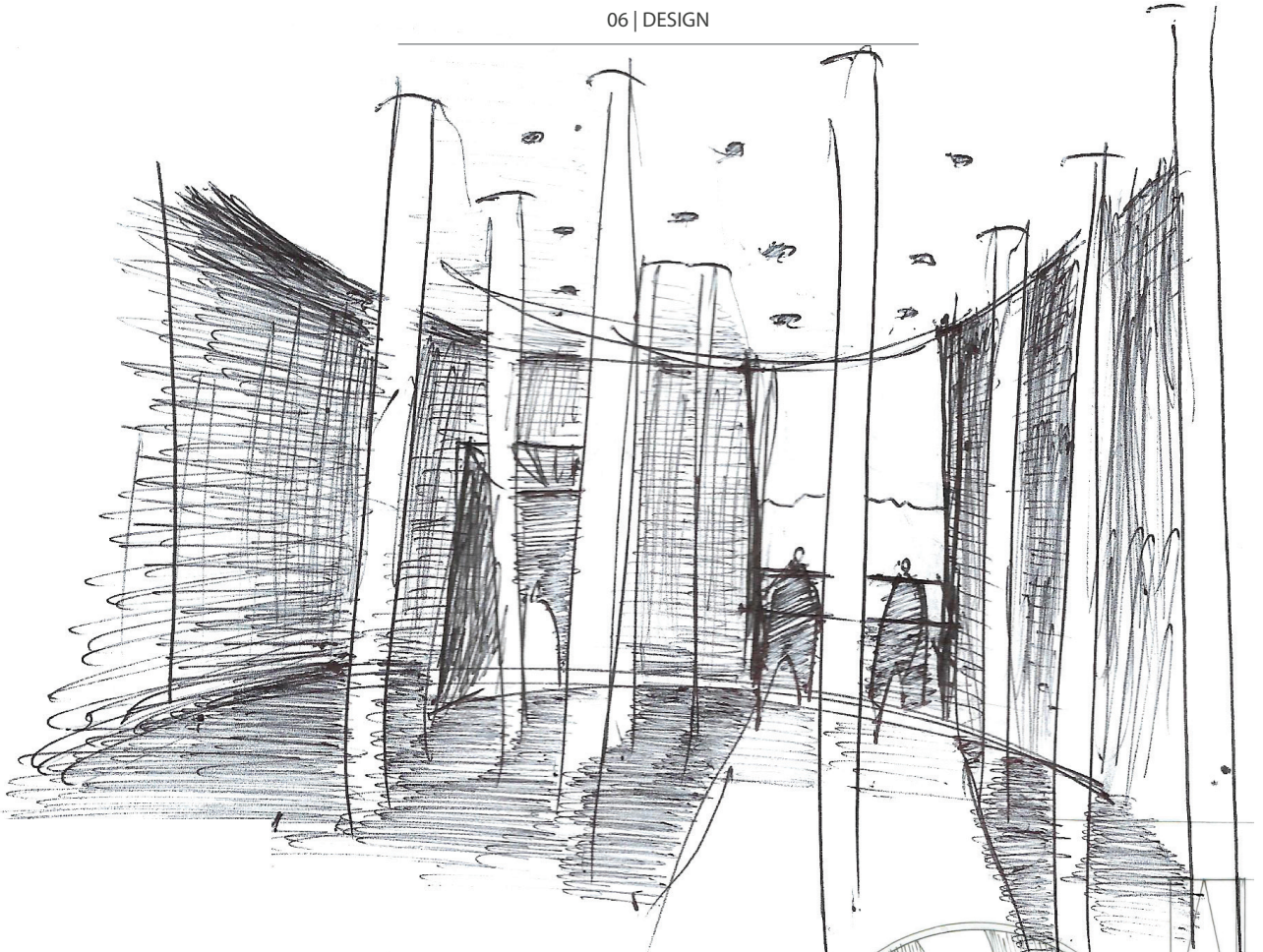


Fig.111. Concentrating the view. From the heart of the disused tank a new window focuses views on the Quagga Mountain Range. During the rain season this window can be used to explain the water cycle to children. The legend of the Rain Animal will continue to have a place in the South African landscape. July, 2016.

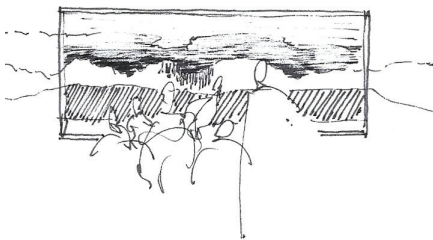


Fig.112. Observing the Rain Animal. April, 2016.

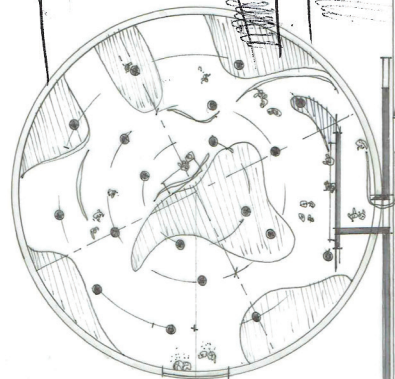


Fig.113. Early plan of the Environment Gallery. Showing the circulation route and splash pools as play areas. Note the columns carrying the roof. August, 2016.

### 6.5.3 REGROUP

*Concentrating the view*

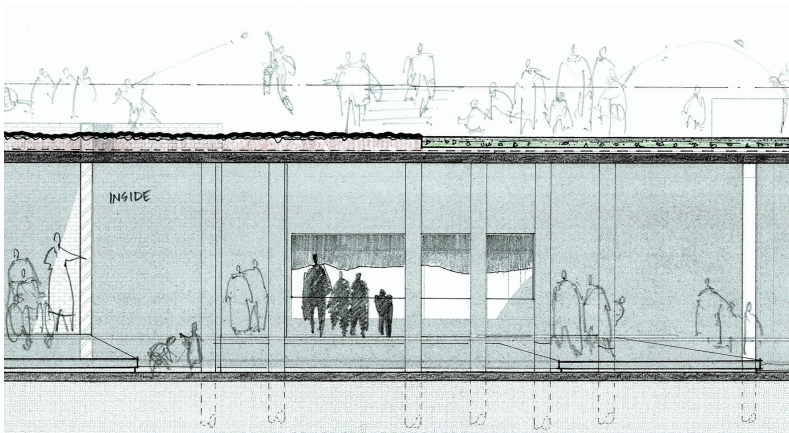


Fig.115. Framing the view. Cross-section of the environment gallery. Breaking the existing tank to permit natural light and frame the view across the valley. July, 2016.

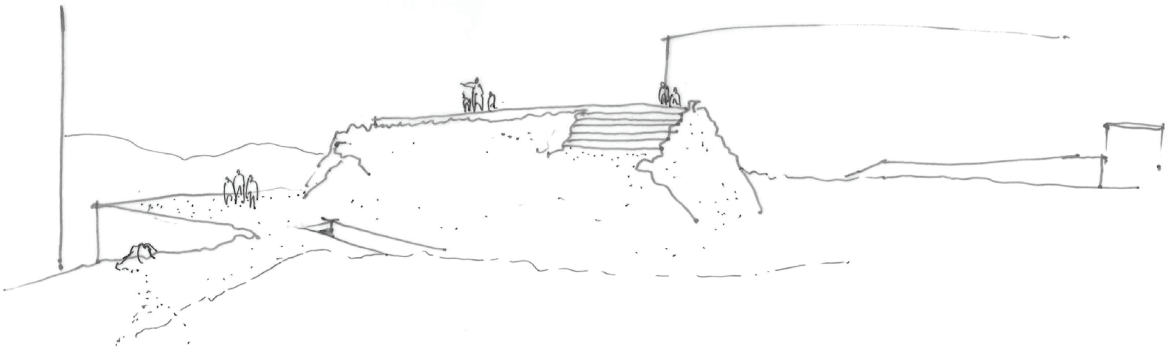


Fig.114. Perspective of the outdoor room from the restaurant. Surface treatment to accommodate crowds where views are highlighted. July, 2016.

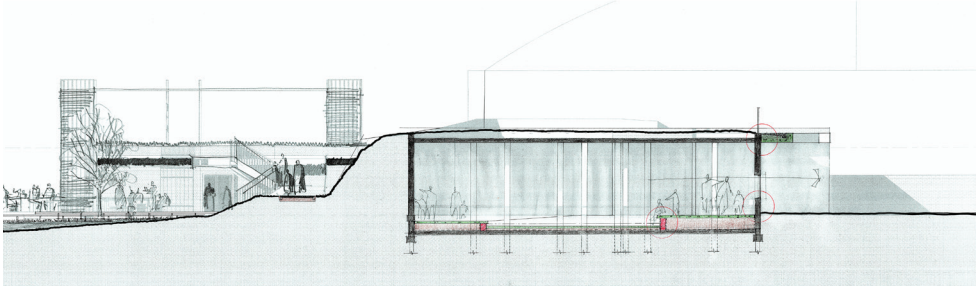


Fig.117. The disused tank. On section, the columns can be seen populating the interior of the tank. With the exception of the walkway, the remaining portions of the ground floor make up the play area. In elevation an early exploration of the restaurant can be seen. July, 2016.

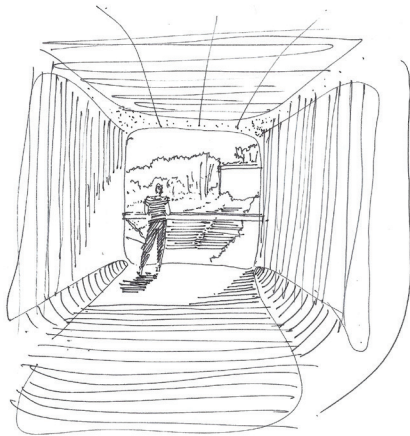


Fig.118. A glance into history. Musée Gallo-Roman, Lyon, France. Bernard Zehrfuss, 1975. The omniscient viewer over looks the Roman ruins at Lyon.

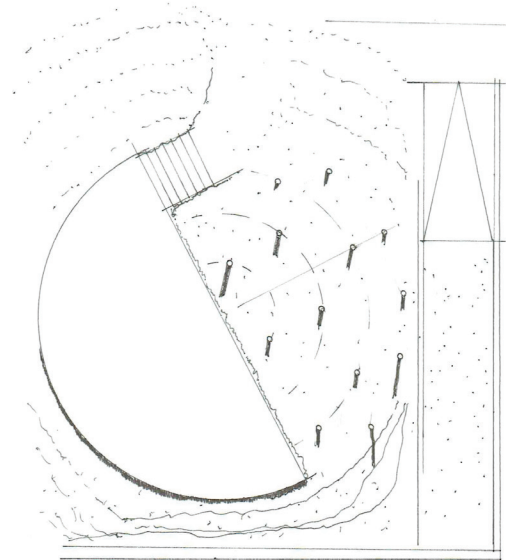


Fig.116. Roof plan of environment gallery. Reflecting the position of the columns beneath, the roof becomes a new landscape for play. In the evenings this urban balcony becomes a place to appreciate the sunset or feed the birds. August, 2016.

## 6.5.4 REGROUP

### *Inspiring Imagination*

The sequencing of spaces allow children to settle down before the main show, these story telling spaces are educational in nature, like the Kumkummi these narratives provide the children with stories that help them unlock the cosmological framework of the 21st century. To welcome repeat visitors, these stories are changed frequently and adapted to the age group of the viewer, ensuring that the experience is unique with every visit.

The requirements of these regroup spaces demands additional staff members.

The staff break down becomes: 5x Security, 2x Maintenance (grounds), 2x Technicians (mechanical and studio), 6x Permanent guides and finally a total of 10 restaurant staff.

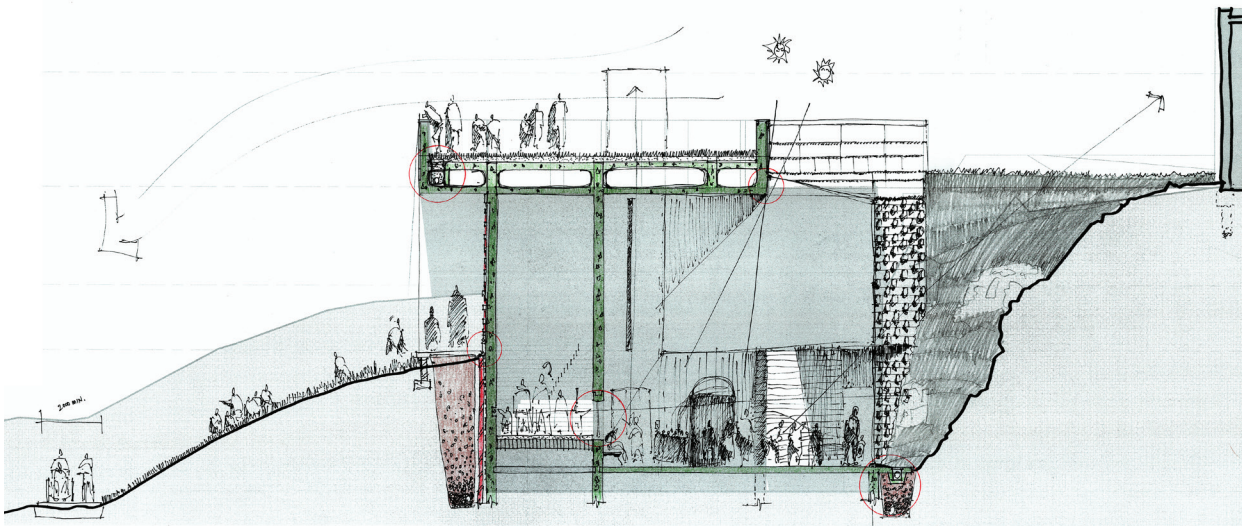


Fig.119. Experience. While waiting for the show (1h run time) the visitor spends most of his time waiting. The lobbies and receptions are designed to intrigue children to ask questions. In this section, a view towards the water tank allows for an engagement. A story is designed into the programme such that a child is inspired to question and form an understanding before entering the planetarium. Upon exiting the planetarium, the child can re-explore his environment, one element at a time. August, 2016.

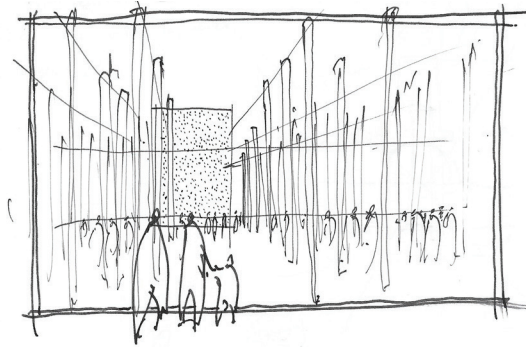


Fig.121. Visual participation. *Sticks and Stones* pavilion, 2014. David Chipperfield. Berlin, Germany.

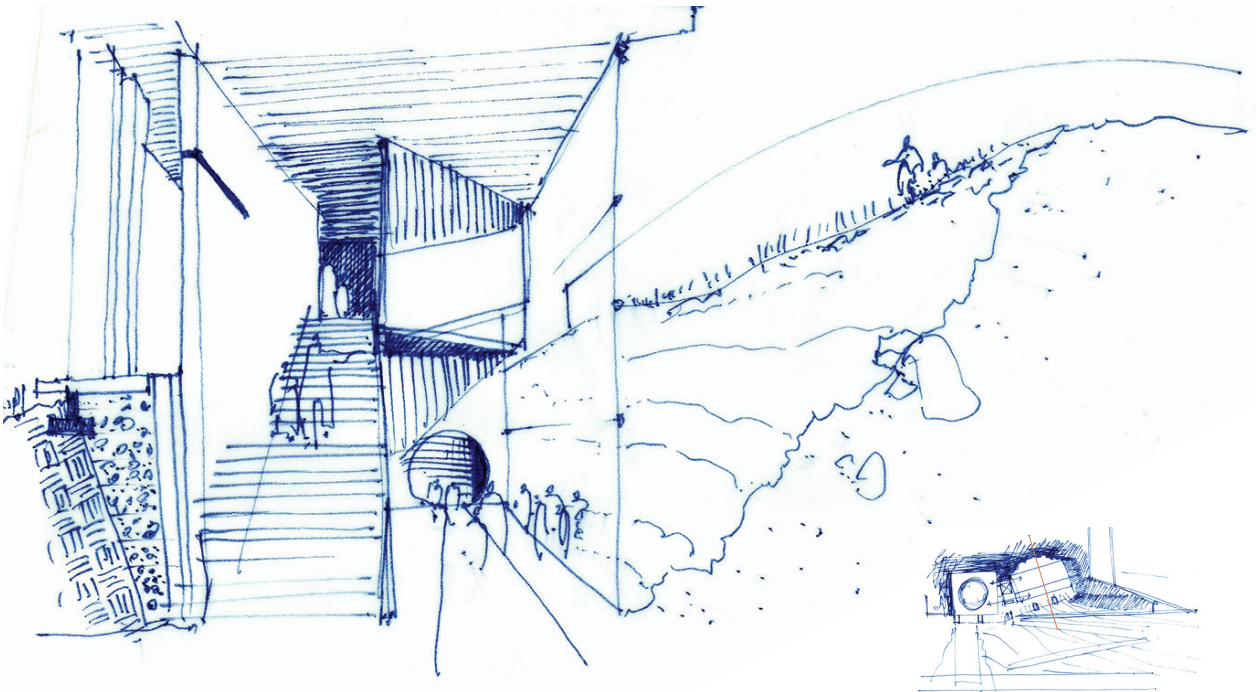


Fig.120. The story of water. The planetarium's lobby becomes another story telling room. The story of the safe-keeping water is told to the children. With the tank positioned directly above the viewer, the child experiences the significance of these formidable containers. This glass facade permits natural light into the lobby and encourages visual participation. Inspired by David Chipperfield's *Sticks and Stones* pavilion, the lobby becomes accessible to passers-by, encouraging them to explore. August, 2016.

## 6.5.5 THE URBAN BALCONY

*An alternative route home*

The urban balcony is envisioned as a widened pavement, a place for a moment of pause. This swell in the walkway inviting a neighbourly conversation, or a greeting. For the early bird this could be a place to watch the sunrise or stretch on a morning jog.

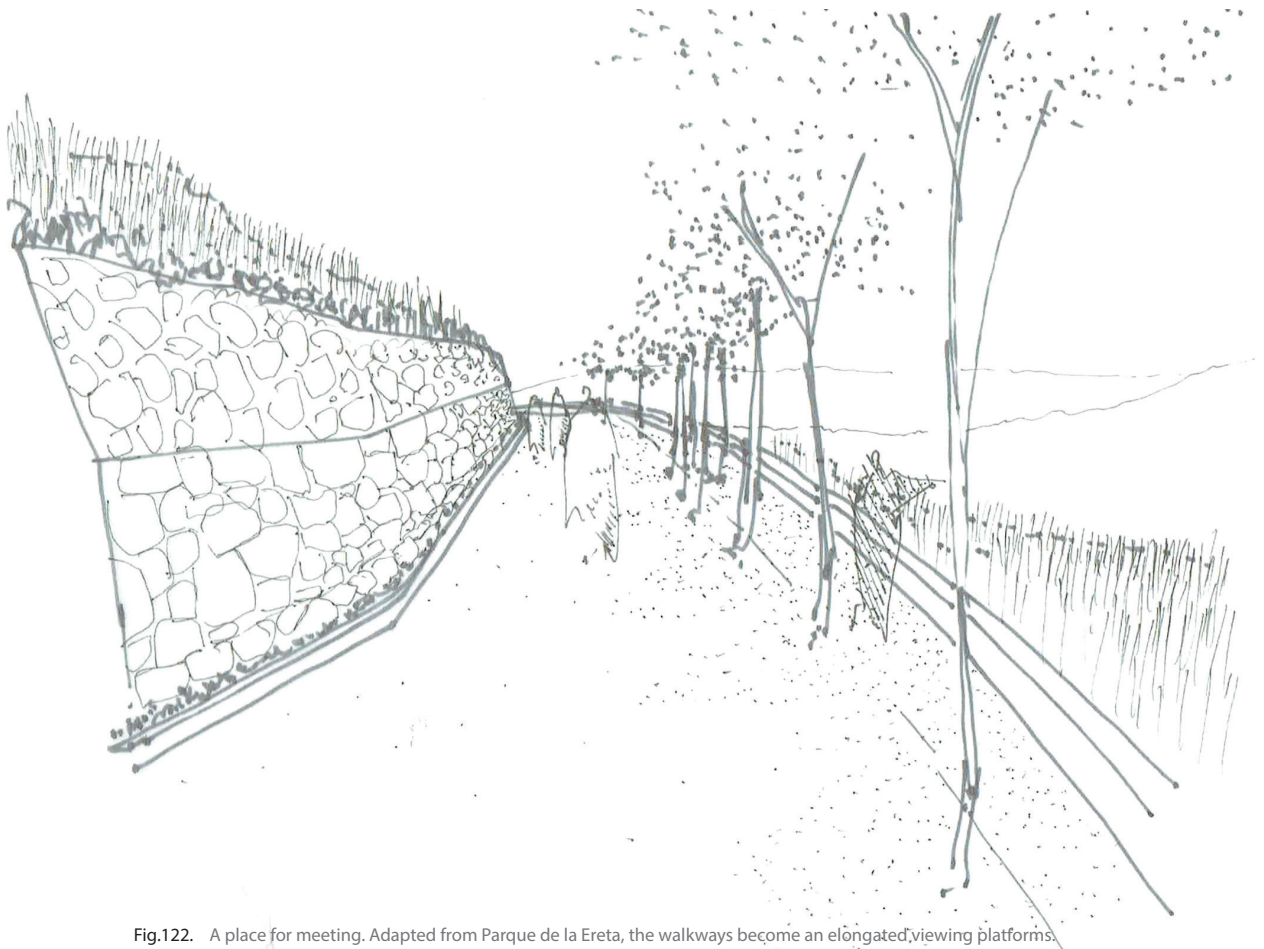


Fig.122. A place for meeting. Adapted from Parque de la Ereta, the walkways become an elongated, viewing platforms. June, 2016.



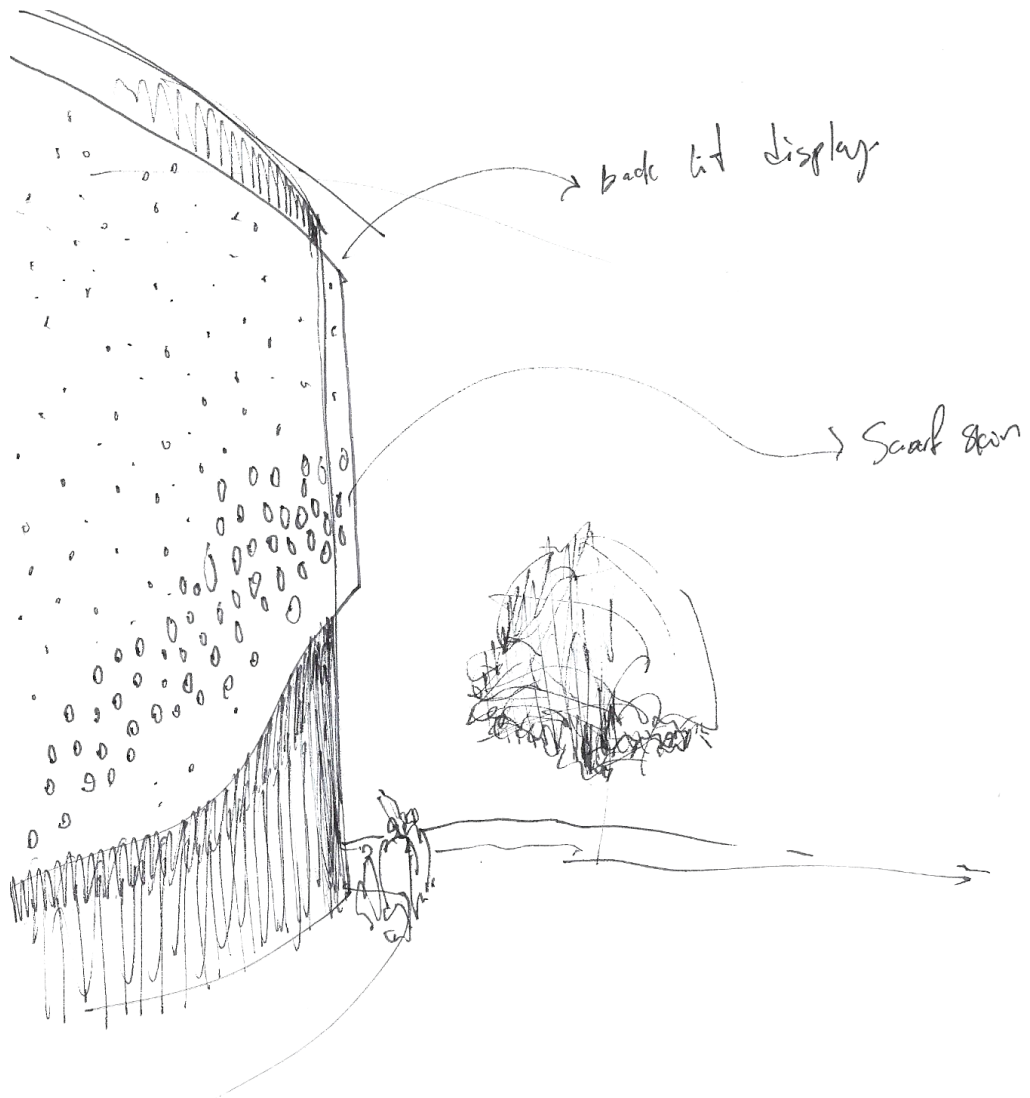


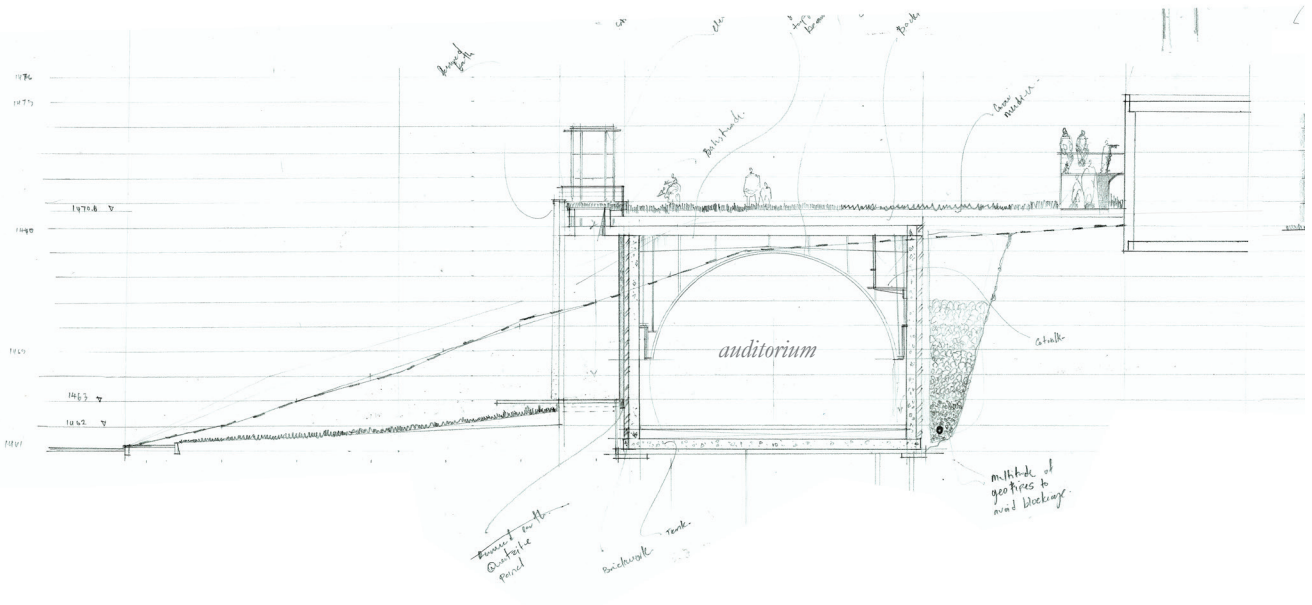
Fig.123. A new skin. Provision for lighting makes the pedestrian routes safer for the local user during the evening. This also provides an opportunity to reconfigure Atteridgeville's skyline. Exemplifying the significance of the hill and the planetarium with a new backlit skin that attaches itself to the existing structure. As the movement routes meander past the tanks people can interact with the new skin.

Initially conceptualised to represent all the students who matriculate from Atteridgeville, the skin would begin blank and with time become populated. Making the water tank a memorial to all the students who remain curious. March, 2016.

## 6.5.6 THE MODERN CAVE

### *Invitation to wonder*

In anticipation of the twenty-fifth anniversary of a democracy, the Thebe Medupe Planetarium offers an inclusive park to all children of the rainbow nation. It is a place on the hill that allows for all its peoples to congregate and appreciate the diversity of South Africa. This scheme provides an example for future developments in underprivileged suburbs. This park becomes an invitation to wonder and rejoice the new South Africa.



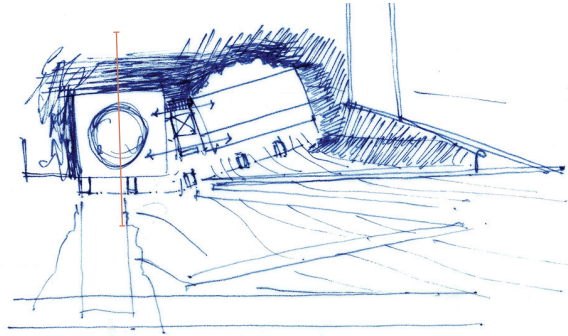


Fig.125. Carved out of the landscape the planetarium does not compete with the existing structures, rather it highlights them by becoming the podium on which they rest.

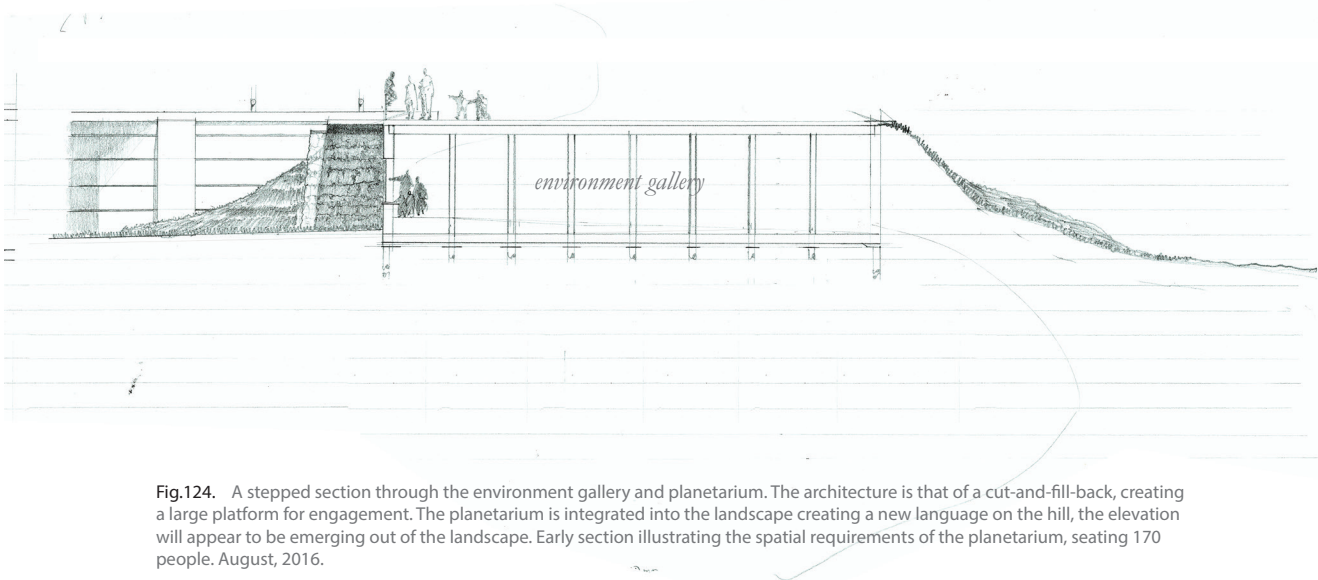
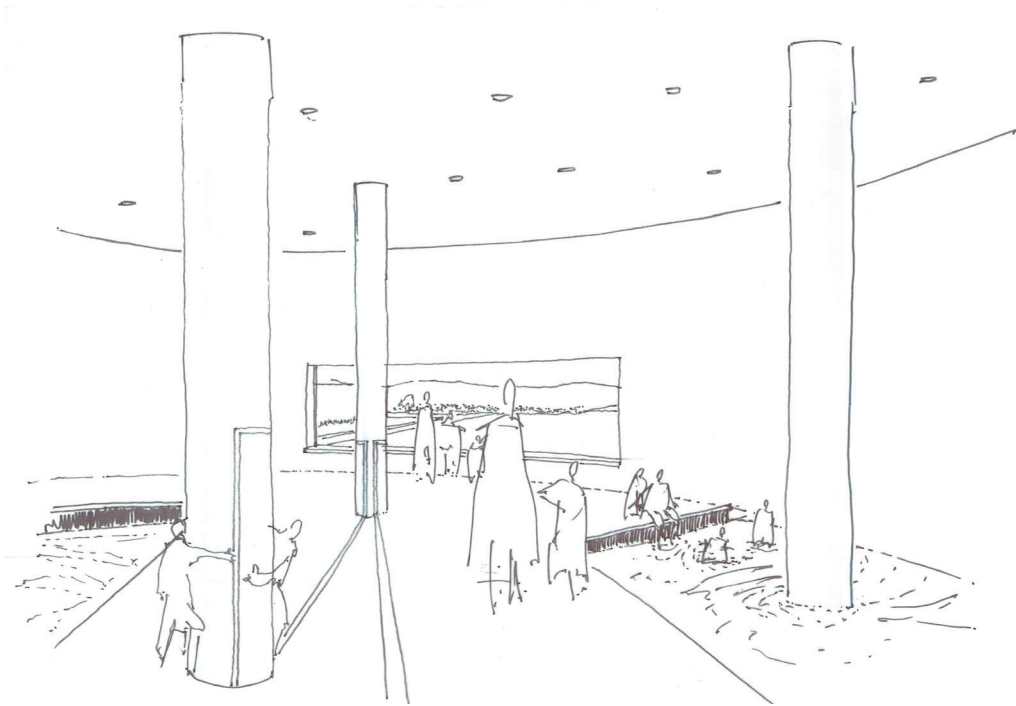


Fig.124. A stepped section through the environment gallery and planetarium. The architecture is that of a cut-and-fill-back, creating a large platform for engagement. The planetarium is integrated into the landscape creating a new language on the hill, the elevation will appear to be emerging out of the landscape. Early section illustrating the spatial requirements of the planetarium, seating 170 people. August, 2016.

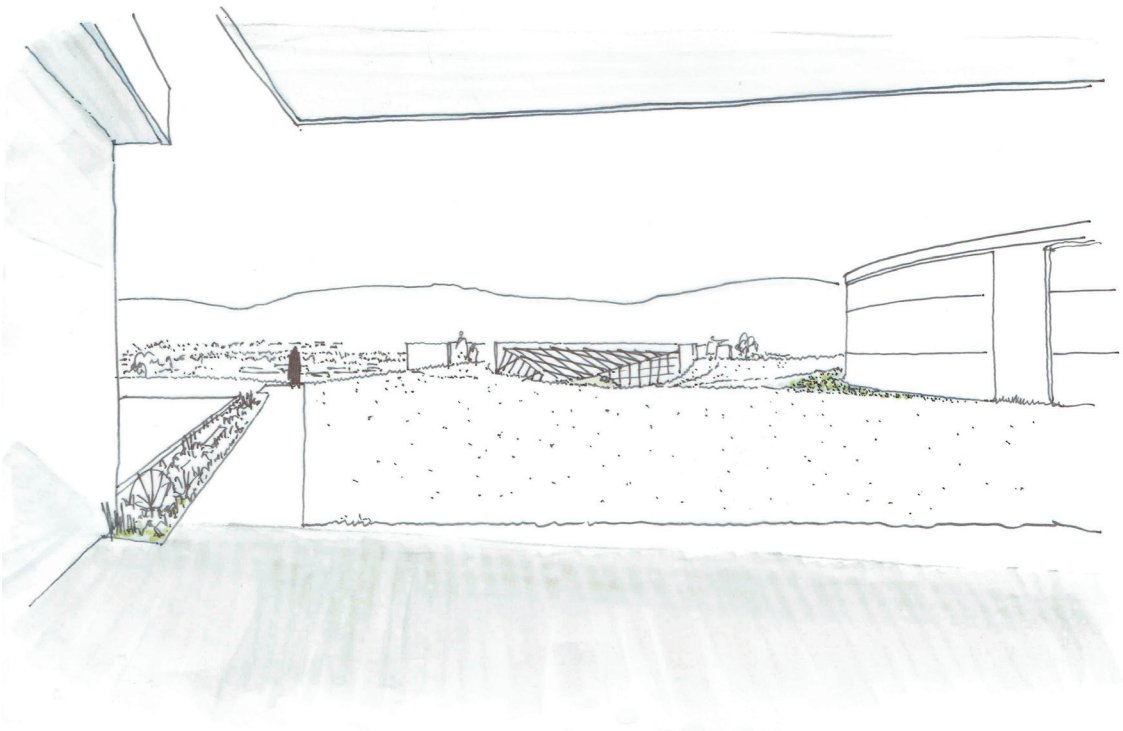
# THE ENVIRONMENT GALLERY

*'The rock pool'*



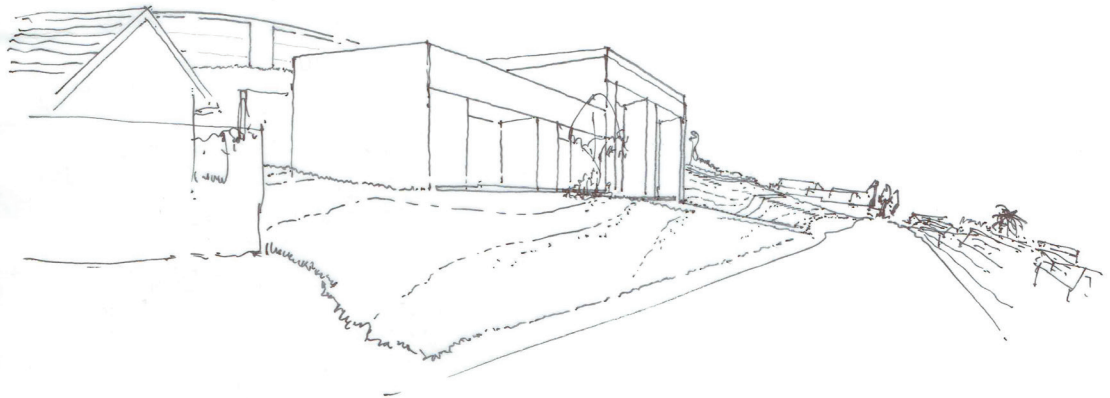
## CONCENTRATING THE VIEW

*Emphasising the background*



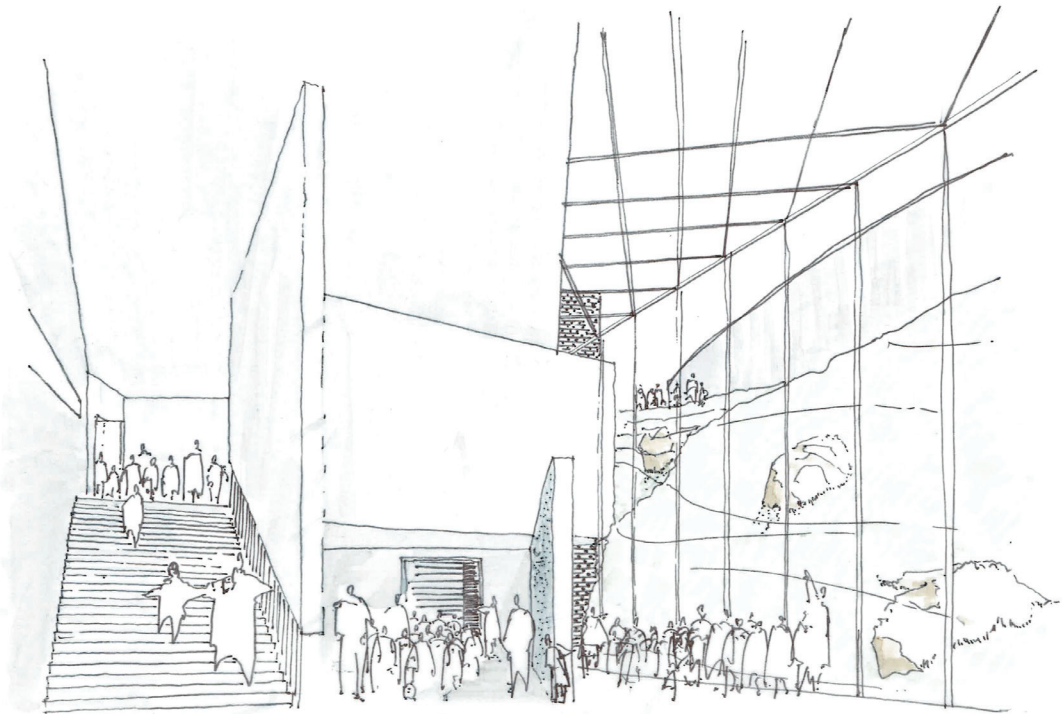
## THE HILLTOP

*Approach from Mankopane Street*



# STORYTELLING

*Thebe Medupe Planetarium*



## THE EVERYDAY

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*“Double-up”*

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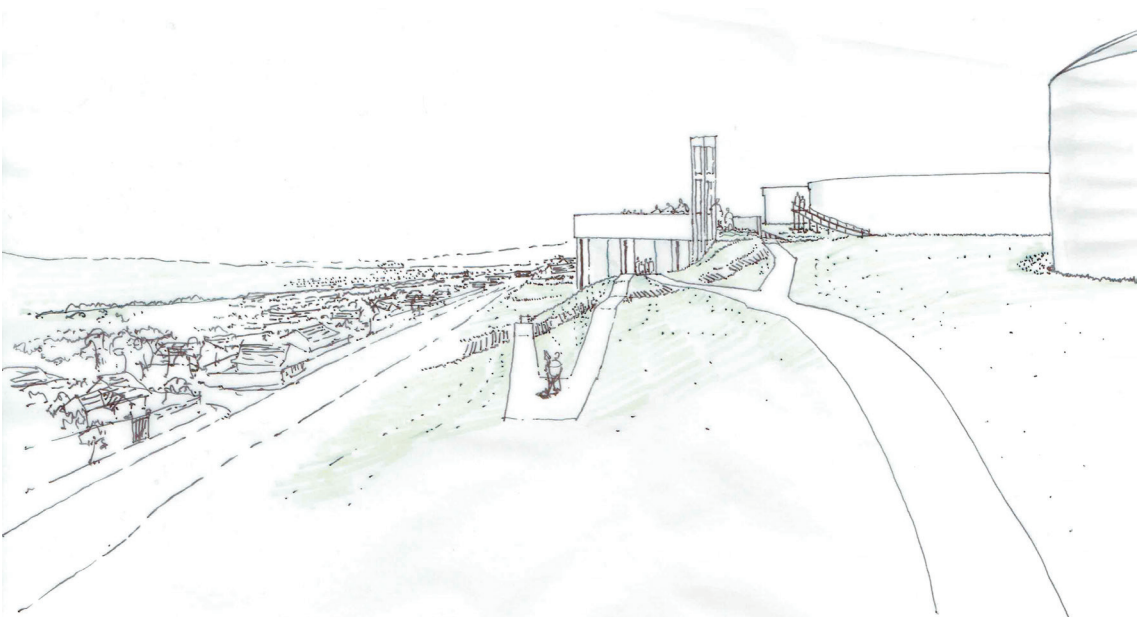


## 3<sup>RD</sup> PLACE

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*Reading the landscape*

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*“We may define the ideal outcome of architecture as being that a building should serve as an instrument which mediates all the positive influences and intercepts all the negative influences affecting man... a building cannot carry out this task unless it is itself as finely nuanced as the surroundings in which it stands.” - Alvar Aalto.*

# 07 TECHNÈ

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## *Refining the intention*

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The technical chapter aims to present the honing process of the development of the Thebe Medupe Planetarium. Focusing on the three aspects of the project, this chapter presents the Dome, Water and Light as the three technical topics for the scheme.

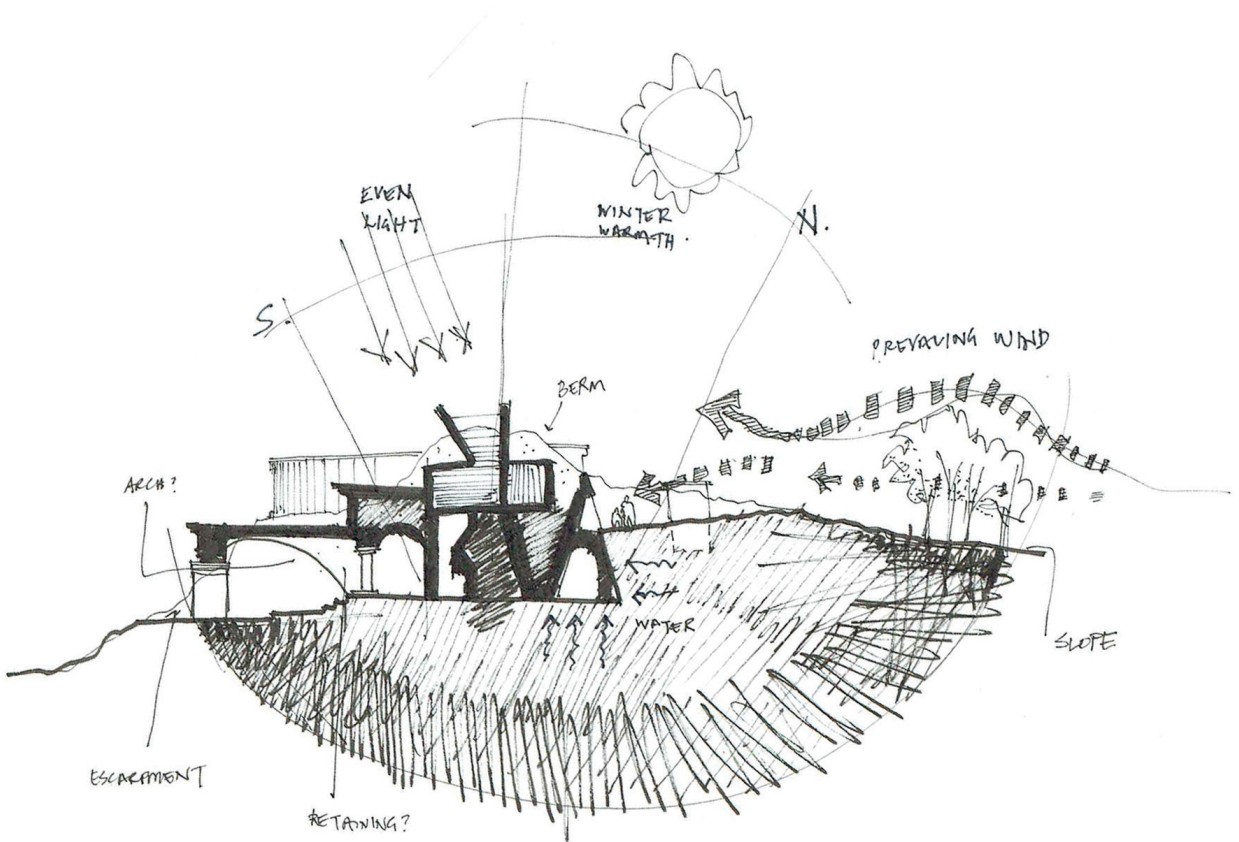
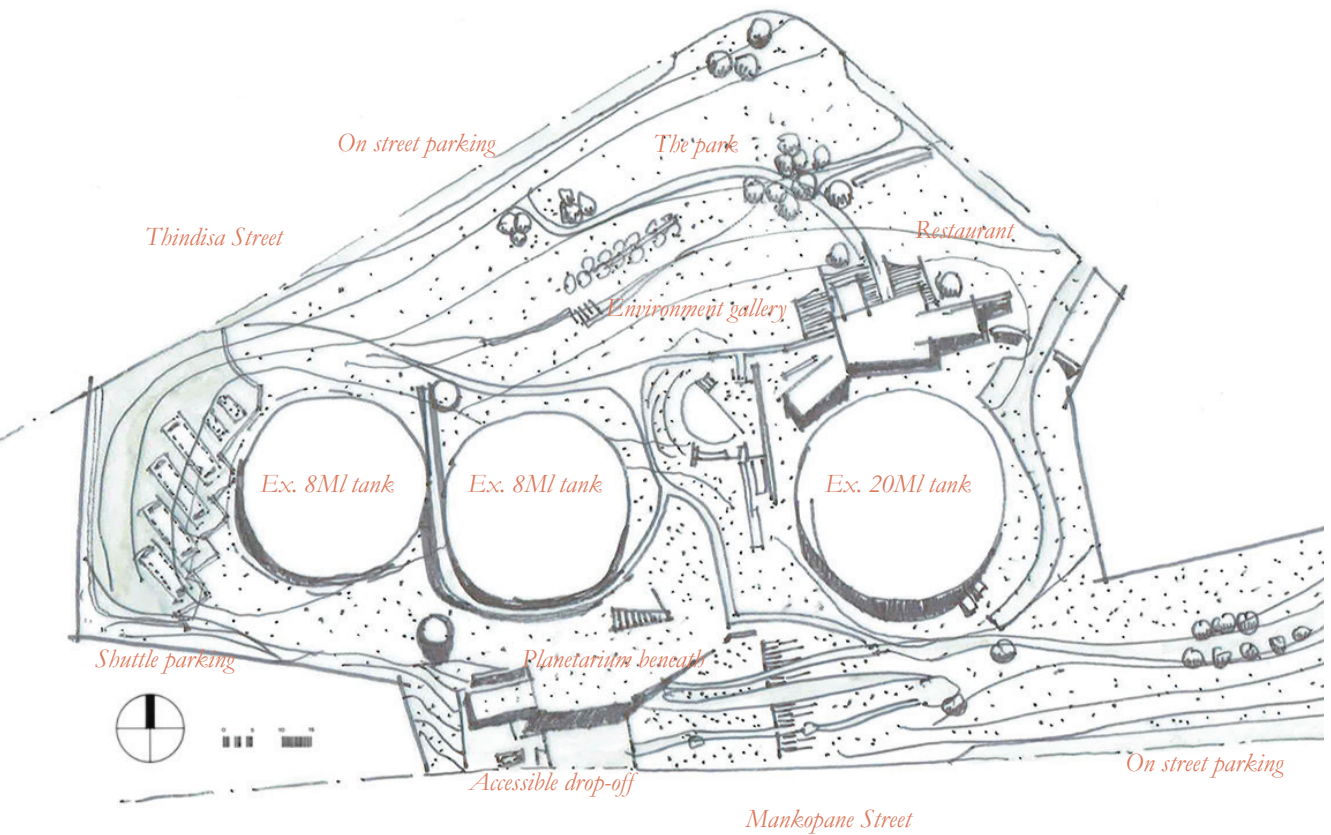
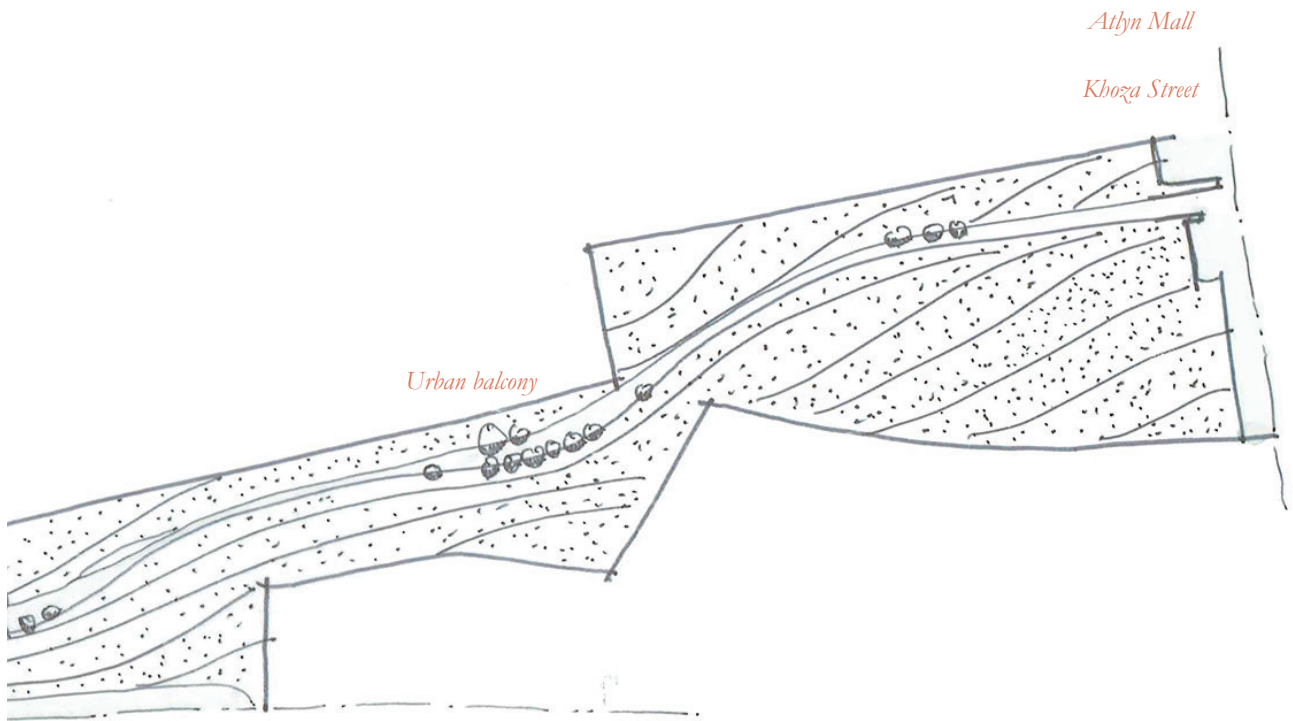


Fig.126. Knowing what to look for. This conceptual diagram considered the external and internal forces affecting the scheme. Attempting to exaggerate the architectural concept as in response to the climatic conditions. May, 2016.

# 7.1 THE THEBE MEDUPE PLANETARIUM

*Technical development*

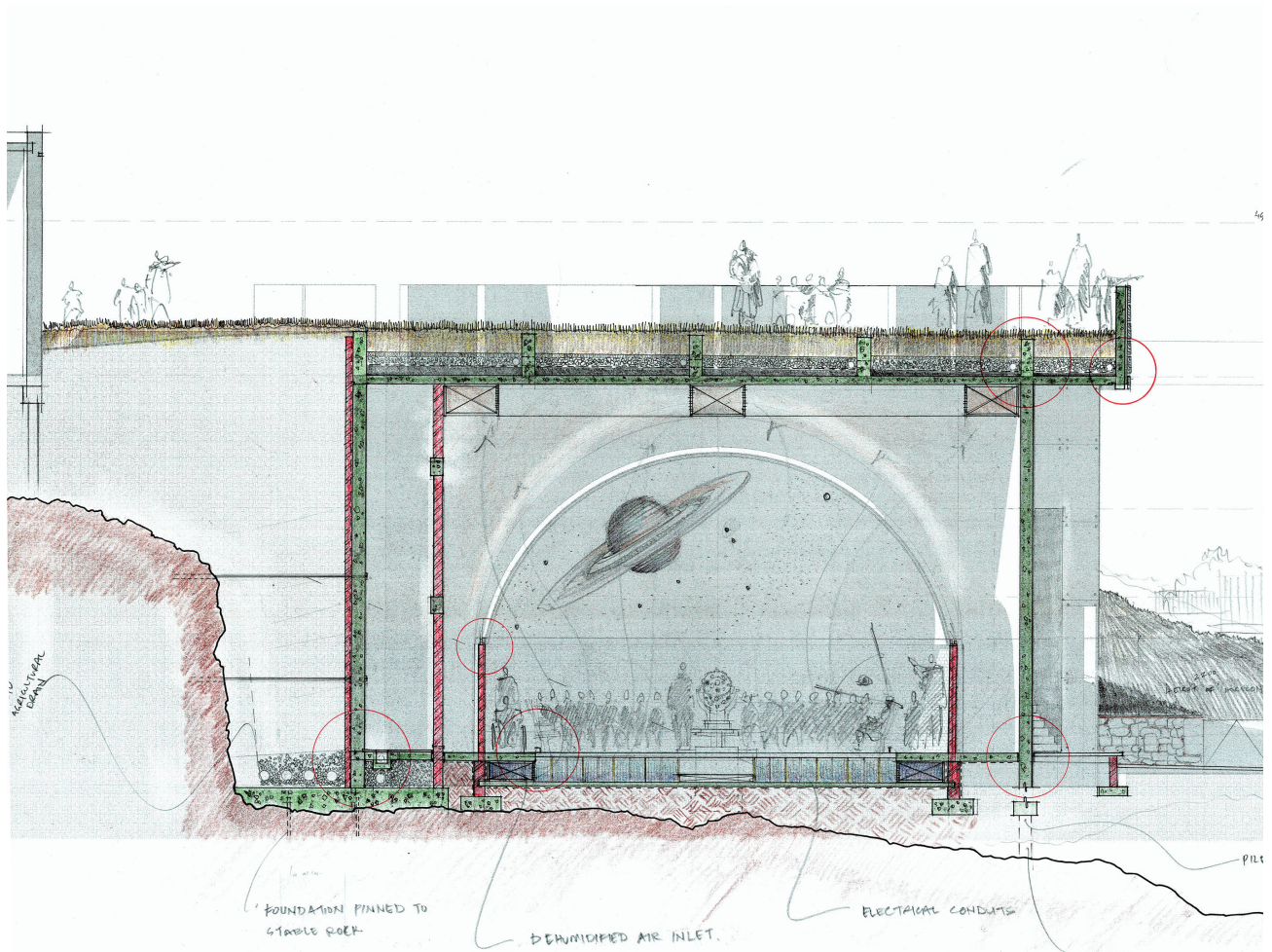


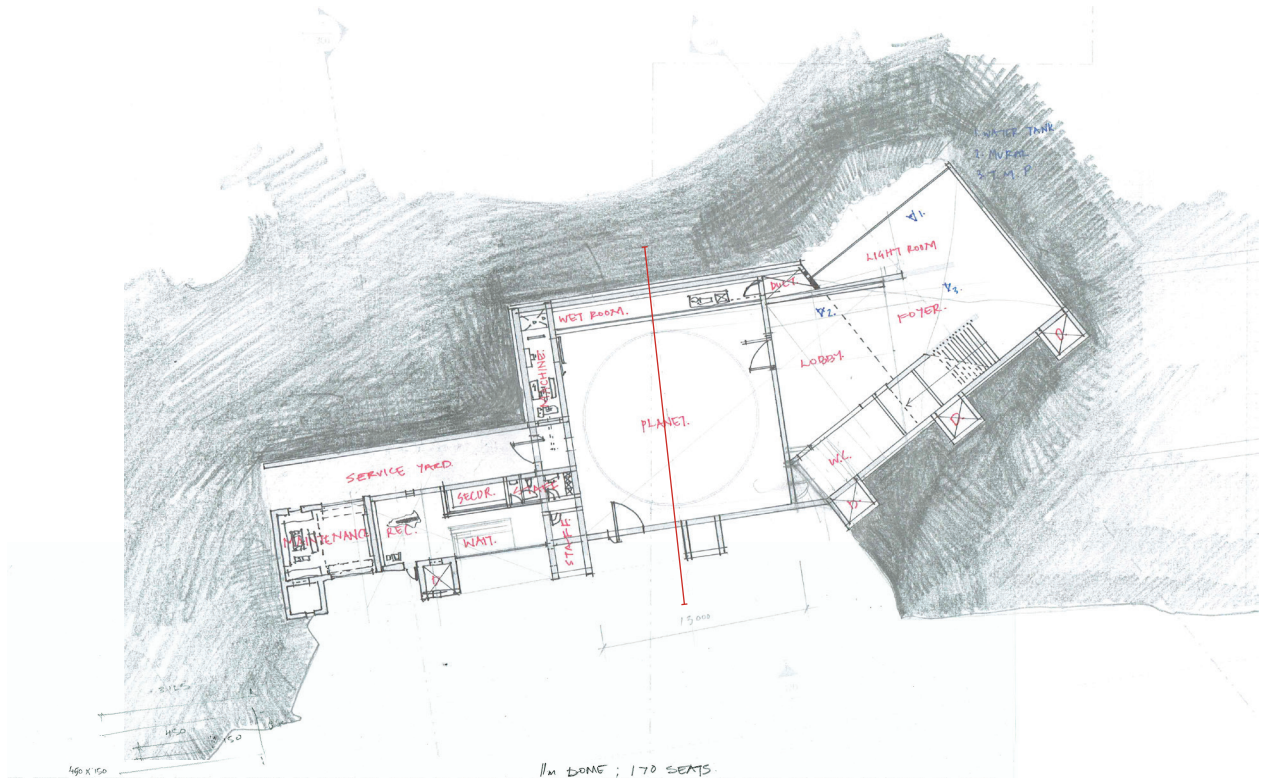


**Fig.127.** Reorientating. The master plan shows the park in its final iteration stage. From the north the park stretches the width of the site, flanking the park on the north east portion is the restaurant, which acts as the new datum on site. For the visitor, the route enters the landscape where the environment gallery provides a large sheltered and supervised play area for the children. Towards the south, a public staircase descends to meet Mankopane street. This is the visual route. The Planetarium is located on the south west beneath the new terrace. A series of meandering ramps, guided by rainwater filtration channels trace the contours to bridge the 10 meter drop. On the west, the shuttle service and maintenance parking grounds are located behind the last tank. To the east the urban balcony stretches to meet Atlyn Mall on Khoza Street.

## 7.1.1 THE DOME

*The projection room*





11m DONE ; 170 SEATS  
OPERATED: YES  
TILT: NO

150mm UPSTAND  
RETAINING

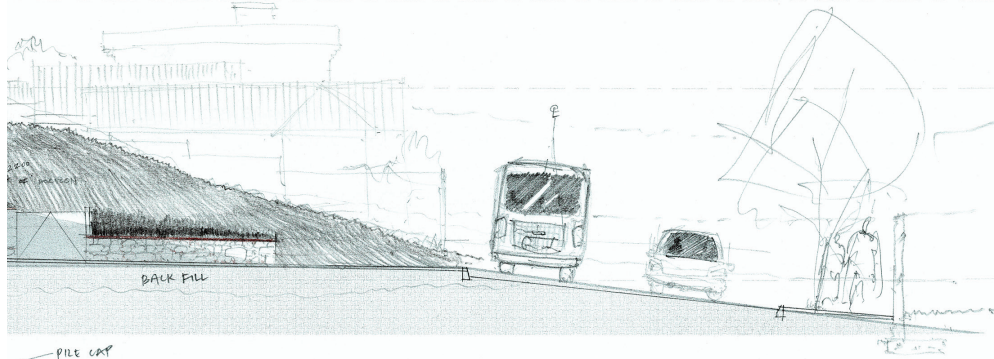
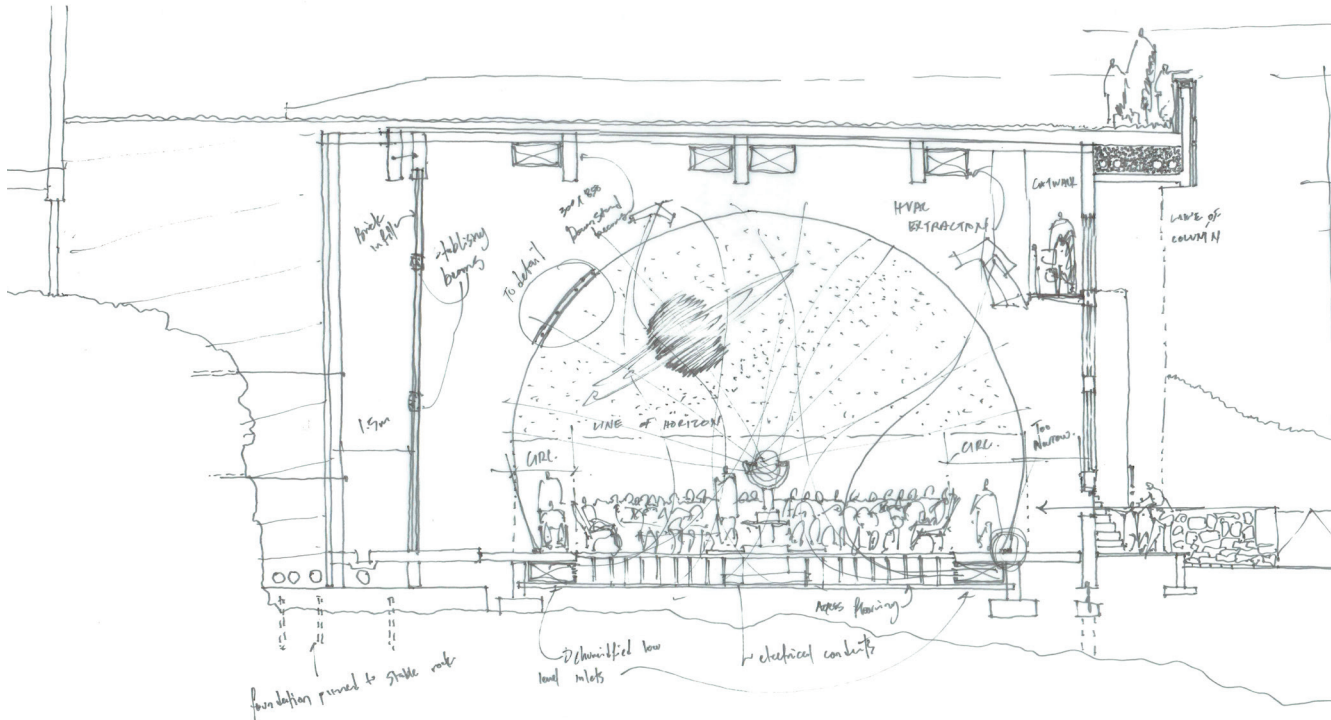


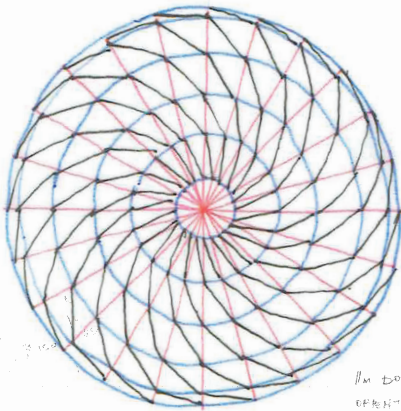
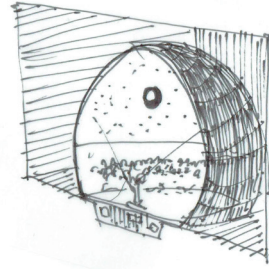
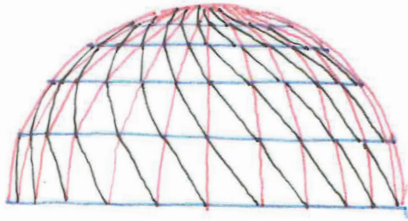
Fig.128. The auditorium. The first iteration of the auditorium focused on the interior space. Responding to the technical requirements of the Carl Zeiss Starmaster projector, the line of horizon was determined and the dome dimensions calculated. This section also considered the retaining wall necessary to withstand the force of the earth and ground water. In this iteration, a series of up-stand beams were utilised to stabilise the earth above. This was inverted to minimise the loading capacity necessary to retain 1m of replaced earth. Instead a well-draining growth medium will be considered in order to rehabilitate the roof.

## 7.1.2 THE SHELL

### *The Schwedler Dome*



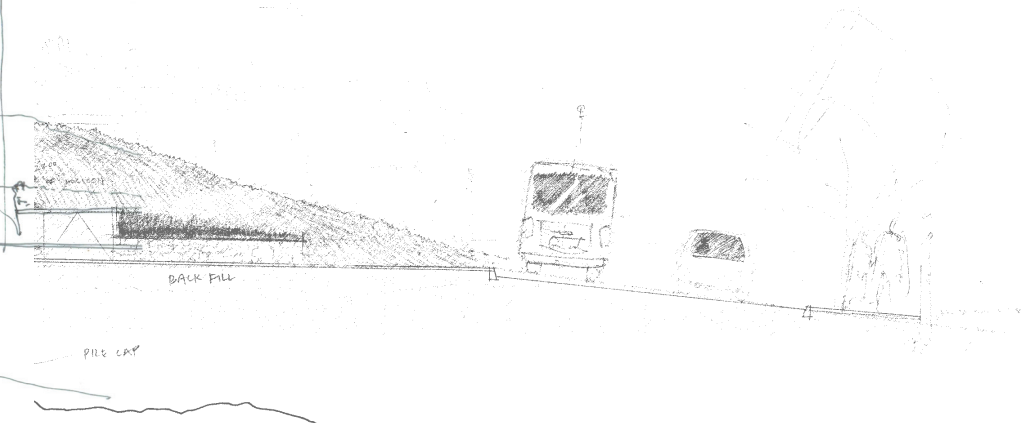




11m DOME : 170 SEATS  
OPERATED : 100  
7000



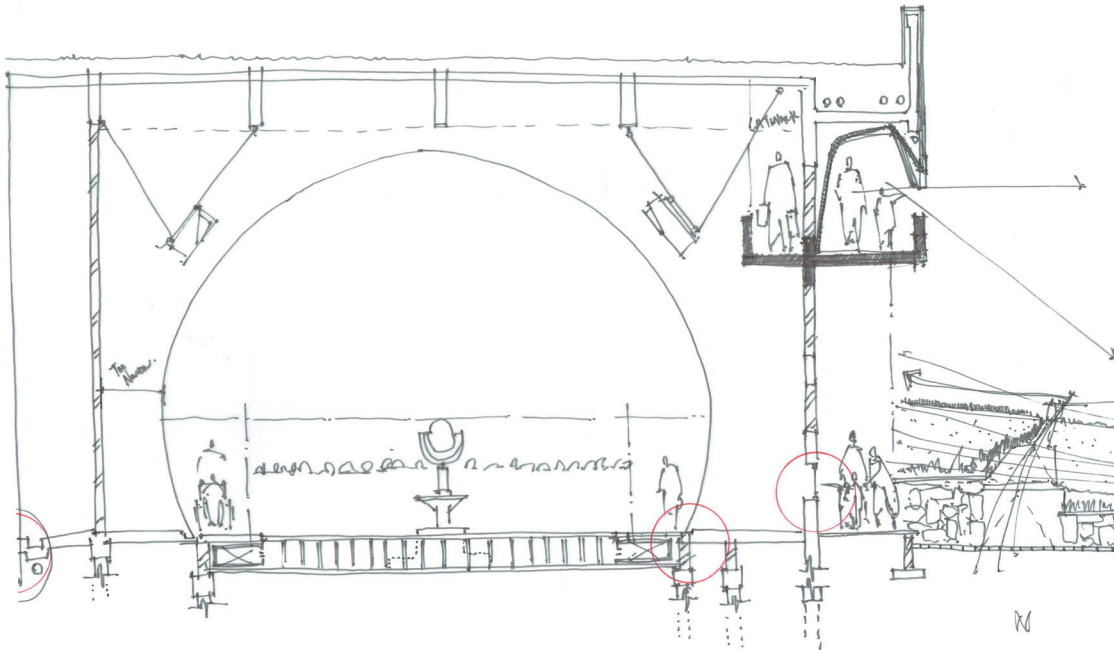
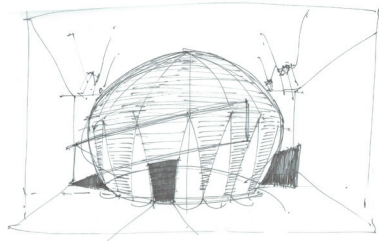
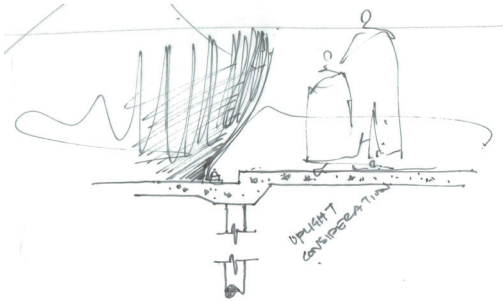
Perhaps increase  
800mm UPSTAINED  
150mm  
100mm

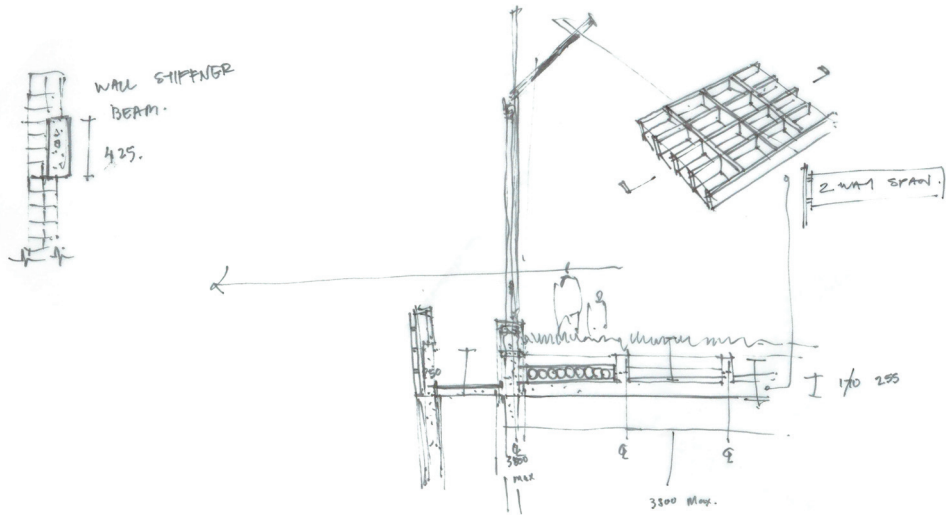


**Fig.129.** The Schwedler dome. Illustrated above, the Schwedler dome makes use of 3 members: the red compression members are laid out longitudinally; and the blue members tie the compression members together by providing tensional support in the latitudes whilst the black diagonal lines provide the necessary triangulation to stiffen the structure. In order to ensure thermal comfort for the 170 visitors, low-lying inlets provide fresh cool air whilst the perforation in the aluminium skin allows the dome to ventilate towards the extraction points provided in the ceiling void. The dome sits within the larger void of the cube, and must be erected within the enclosure. Detail to follow.

### 7.1.3 MAINTENANCE

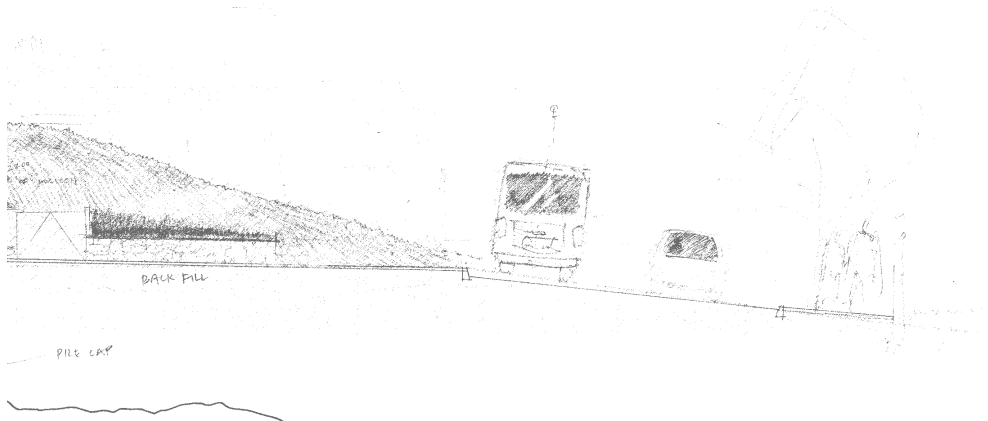
#### *Services*





IN DOME : 170 SEATS  
OPERATED : 100  
TIME : 10

800 mm UPSTAINED  
550 mm  
170 mm

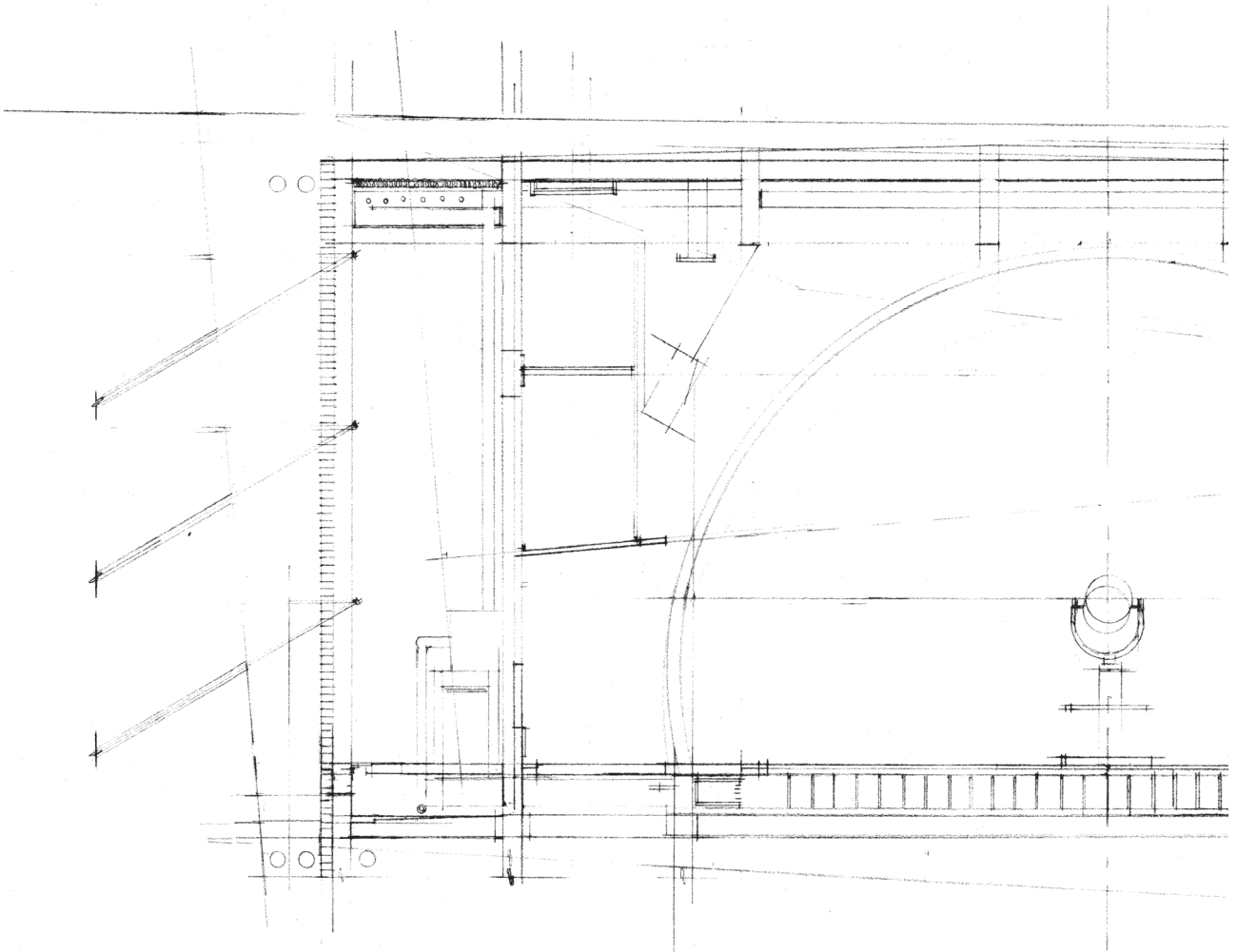


**Fig.130.** The catwalk. In addition to creating an experience for the user, planetariums boast longevity; hence, ease of maintenance and provision for services needs to be considered. The speaker units are mounted externally to avoid obstruction within the dome. A series of down-lighters and up-lighters are used to accentuate the shape of the spherical room such that it provides an opportunity for passers-by to engage with the interior space.

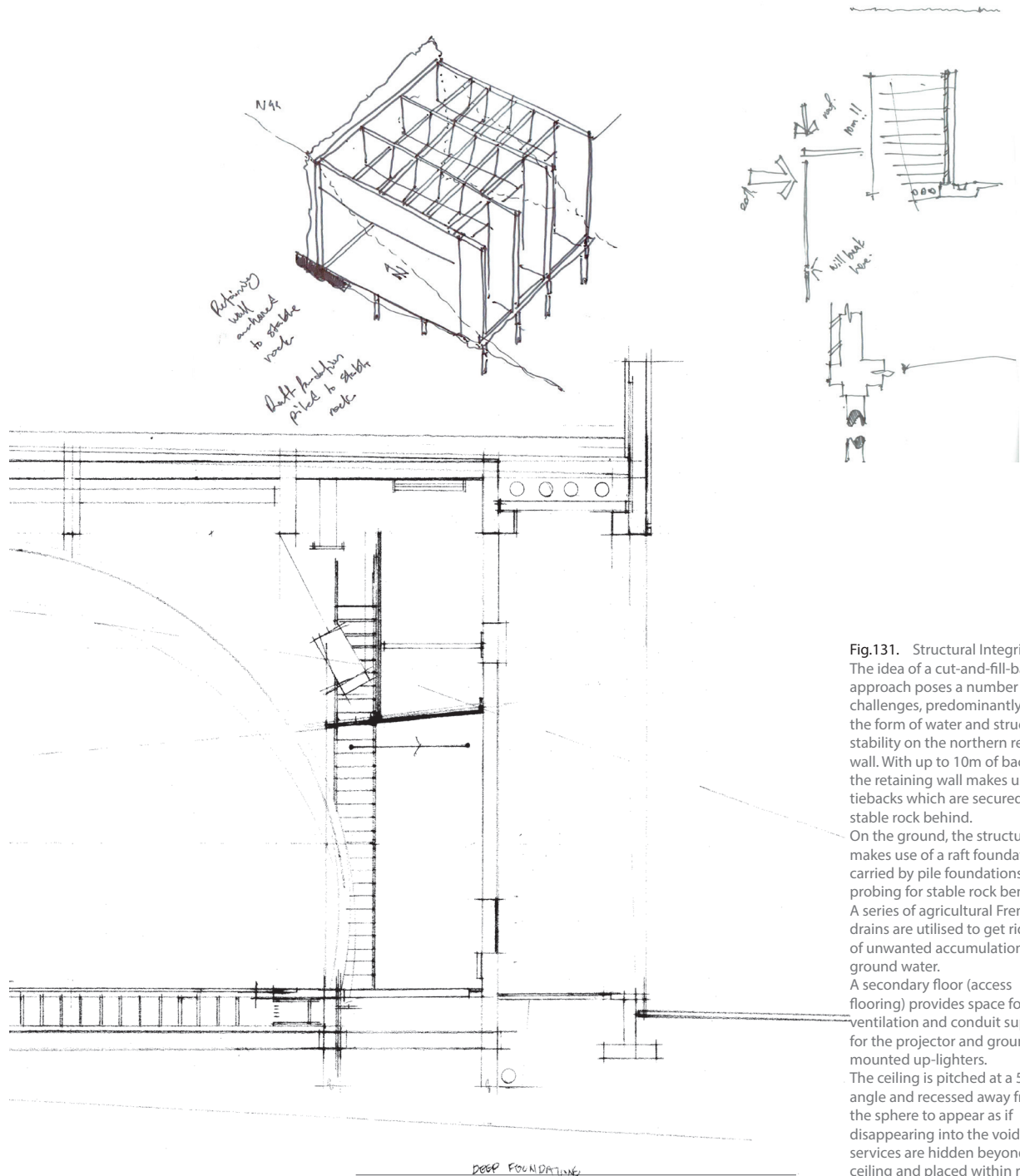
Ventilation is provided through a dehumidifier placed in the service room behind the north wall. This system imports air from the ground via earth tubes to ensure that the necessity for cooling is kept to a minimum. The extracted air is introduced into an insulated air-water heat exchange, before it is recirculated into the system. The service room is highlighted in the section on the following page.

## 7.1.4 THE PLANETARIUM

*October reflection*



CRAWL SPACE



**Fig.131. Structural Integrity.**  
 The idea of a cut-and-fill-back approach poses a number of challenges, predominantly in the form of water and structural stability on the northern retaining wall. With up to 10m of backfill, the retaining wall makes use of tiebacks which are secured to stable rock behind. On the ground, the structure makes use of a raft foundation, carried by pile foundations probing for stable rock beneath. A series of agricultural French drains are utilised to get rid of unwanted accumulation of ground water. A secondary floor (access flooring) provides space for ventilation and conduit support for the projector and ground mounted up-lighters. The ceiling is pitched at a 5° angle and recessed away from the sphere to appear as if disappearing into the void. The services are hidden beyond the ceiling and placed within reach of the catwalk.

DEEP FOUNDATION

## 7.1.5 THE PLANETARIUM

### Cladding note:

Custom 0.58mm thick 'white' powder coated perforated aluminium flat sheet cladding panels fixed with Stainless steel self tapping screws to 12mm MDF board bent to shape on site fixed to steel structure with s/s self tapping screws.

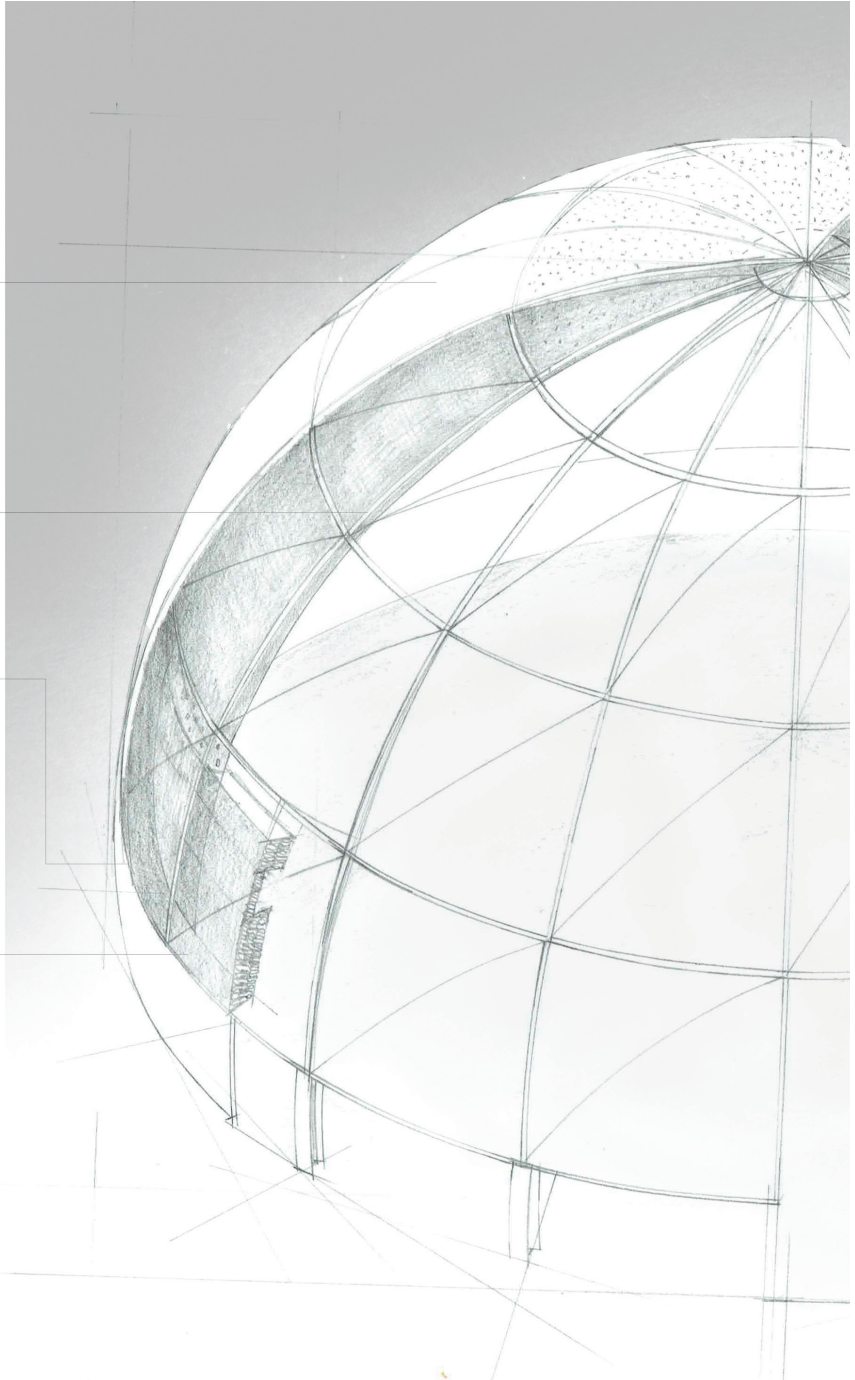
### Structure Note:

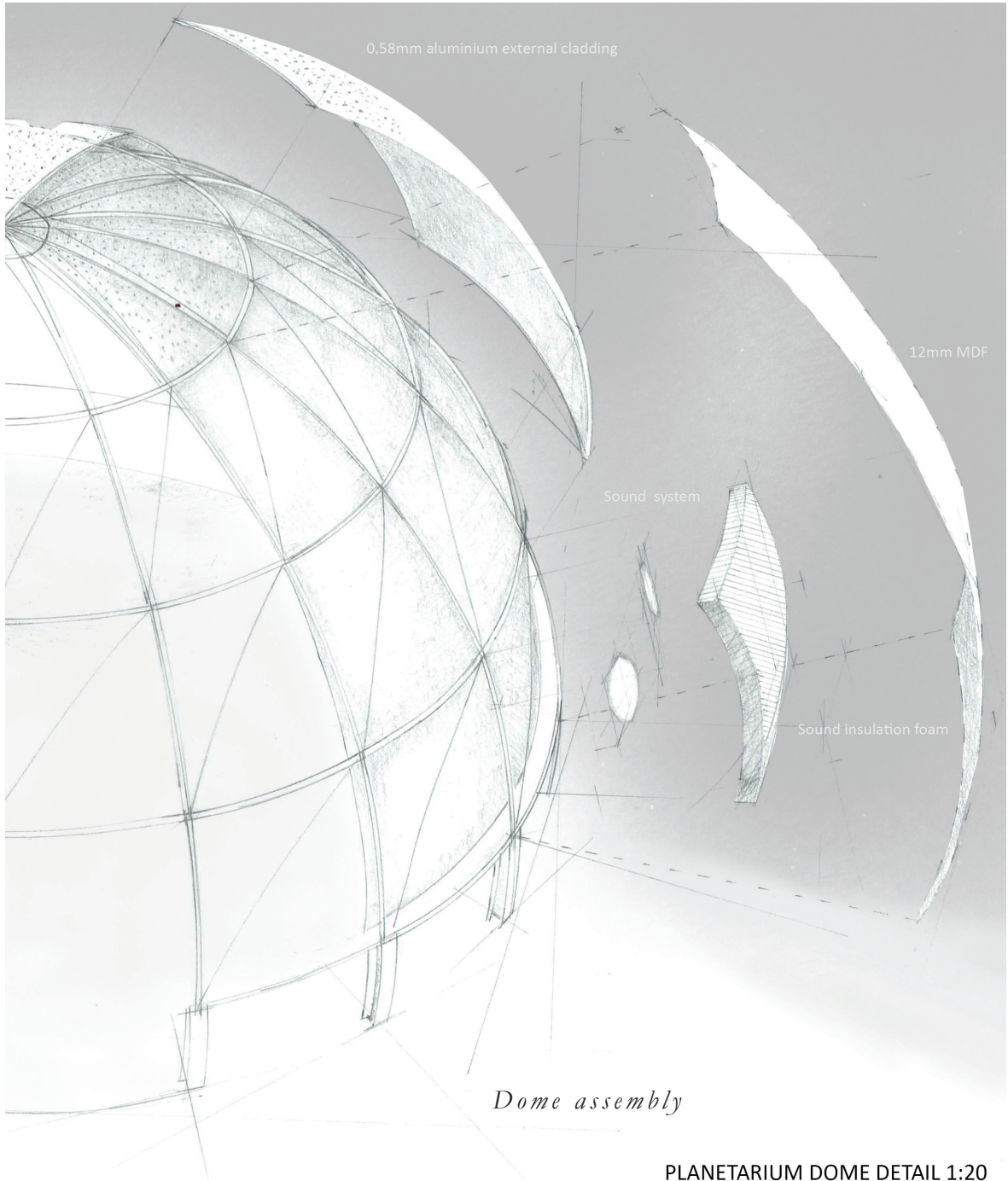
Compression Members: 40x40x3mm Galvanised Mild steel tubular sections with custom fixing plates fixed to 40x40x3mm Galvanised Mild Steel Tension ring beam with 6mm  $\varnothing$  s/s hexagon bolts.

Bottom Tension member: 40x40x3mm Galvanised Mild steel tubular sections fixed to custom bent 230x230x6mm H-columns with Galvanised mild steel end base plates chemically fixed with 6mm  $\varnothing$  stainless steel hexagon bolts to 300mm thick Reinforced concrete ground ring beam as per Engineers detail and specifications.

### Acoustic Note:

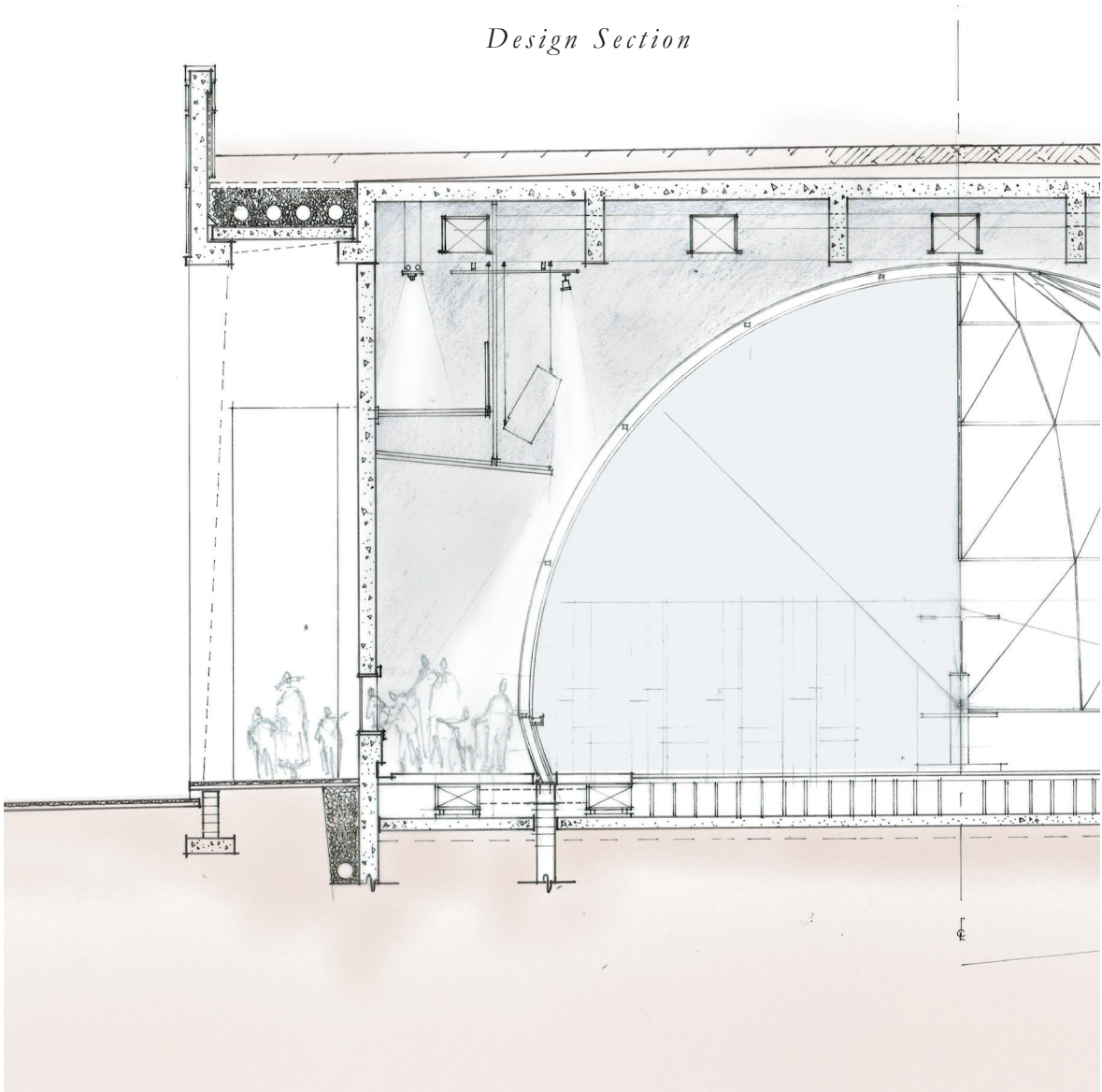
Noise dampening foam to be propped in place with straining wire. Positioned between the MDF board and cut out where speakers are located. Conduits for sound system to be designed by engineer to fit within the provided cavity between the MDF layers.



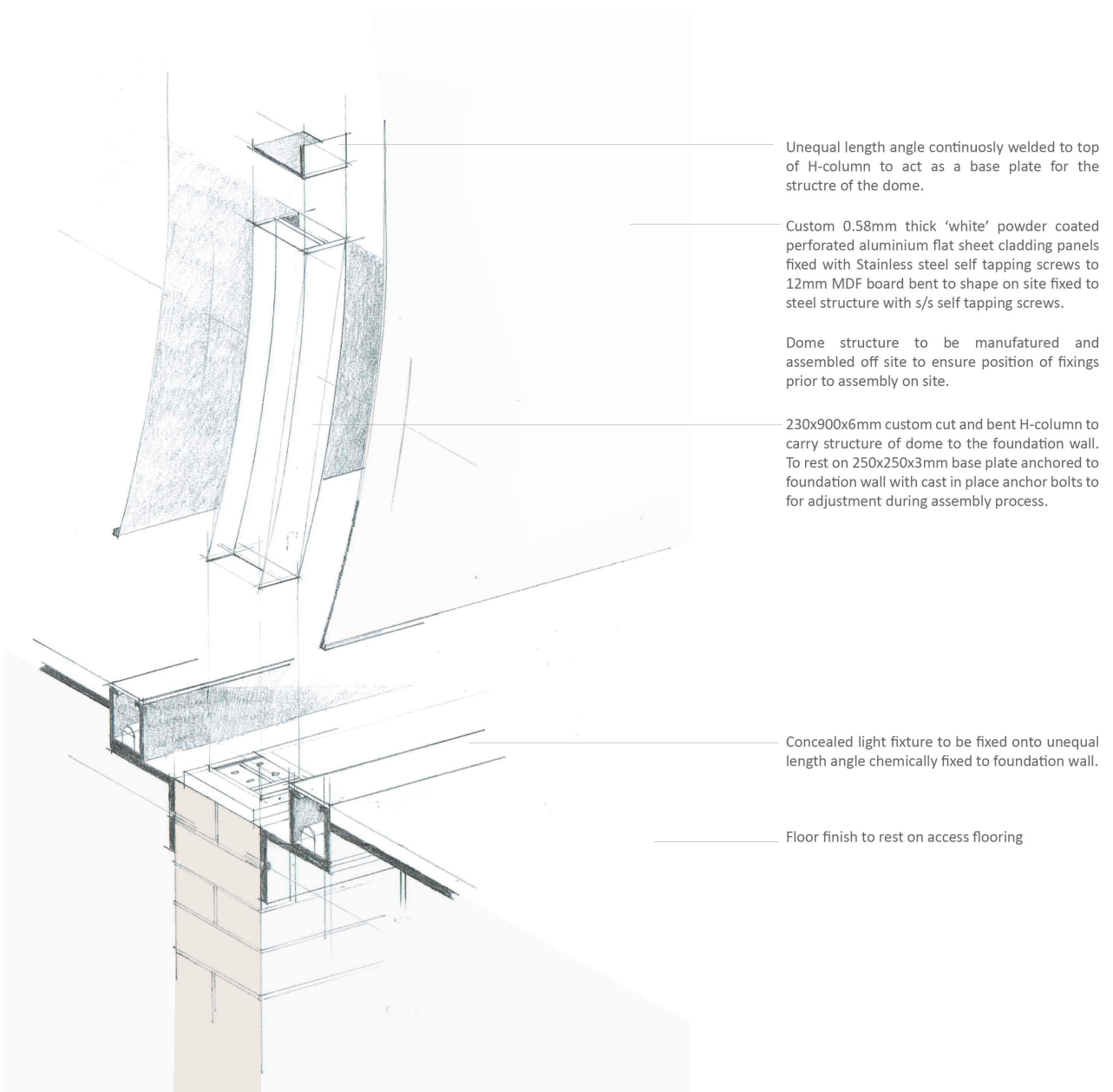


## 7.1.6 THE PLANETARIUM

*Design Section*







*Footing detail 1:20*

## 7.2 WATER

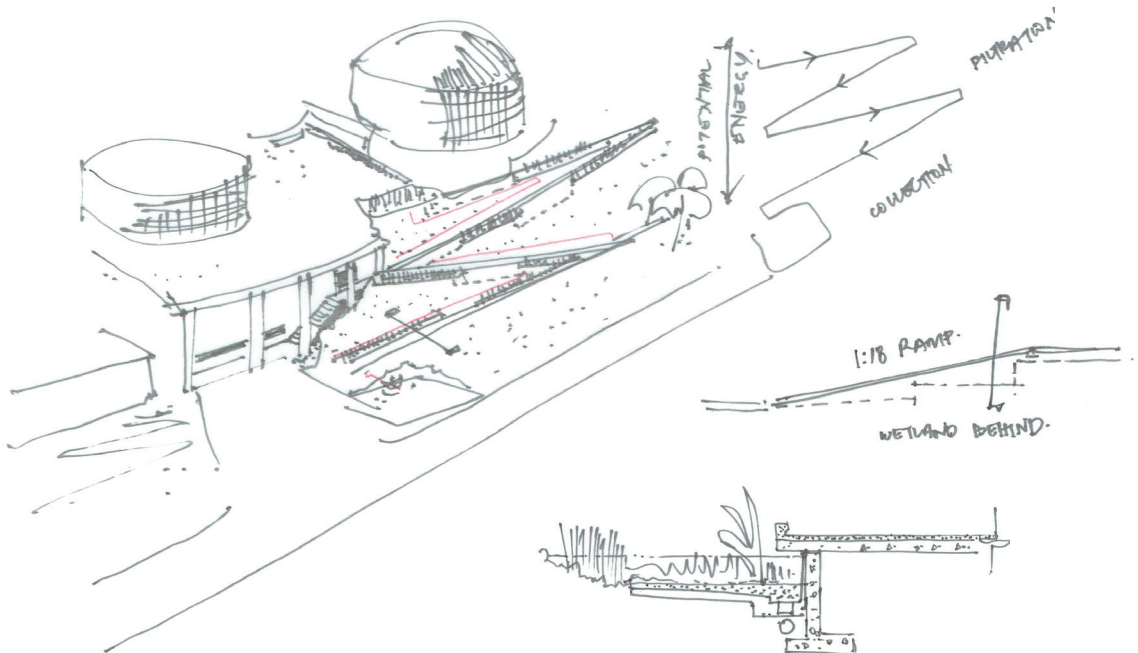
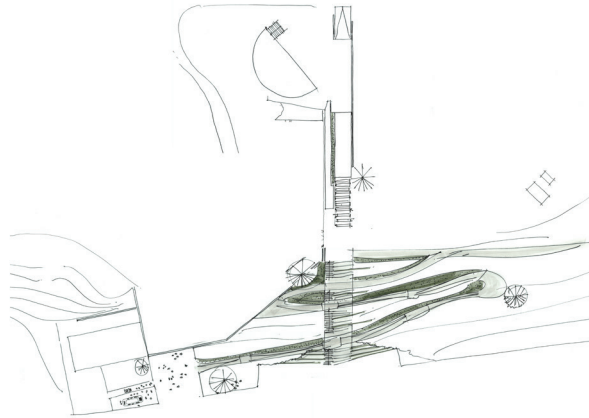
### *Rain water drainage and filtration*

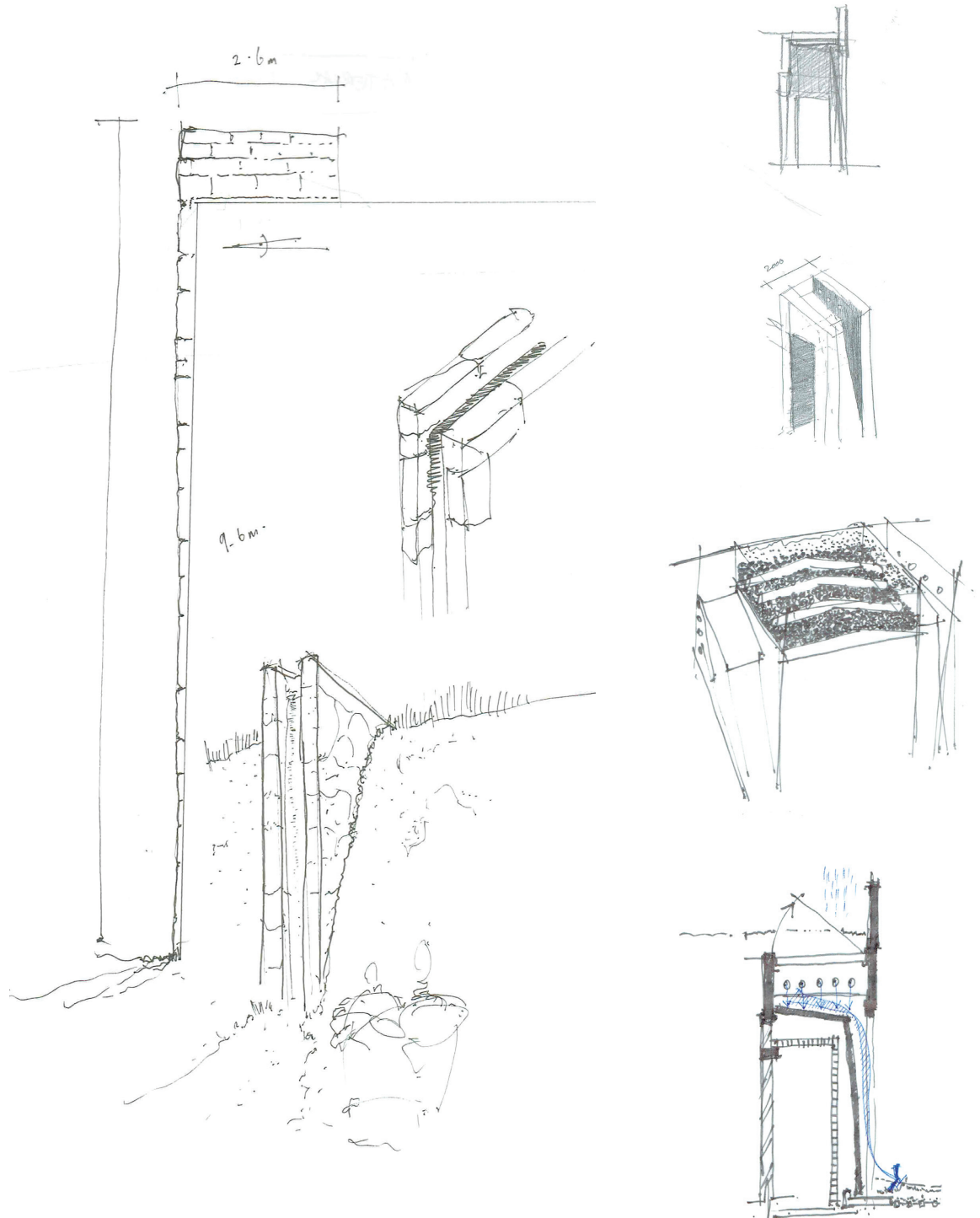
Fig.132. Approach to water.

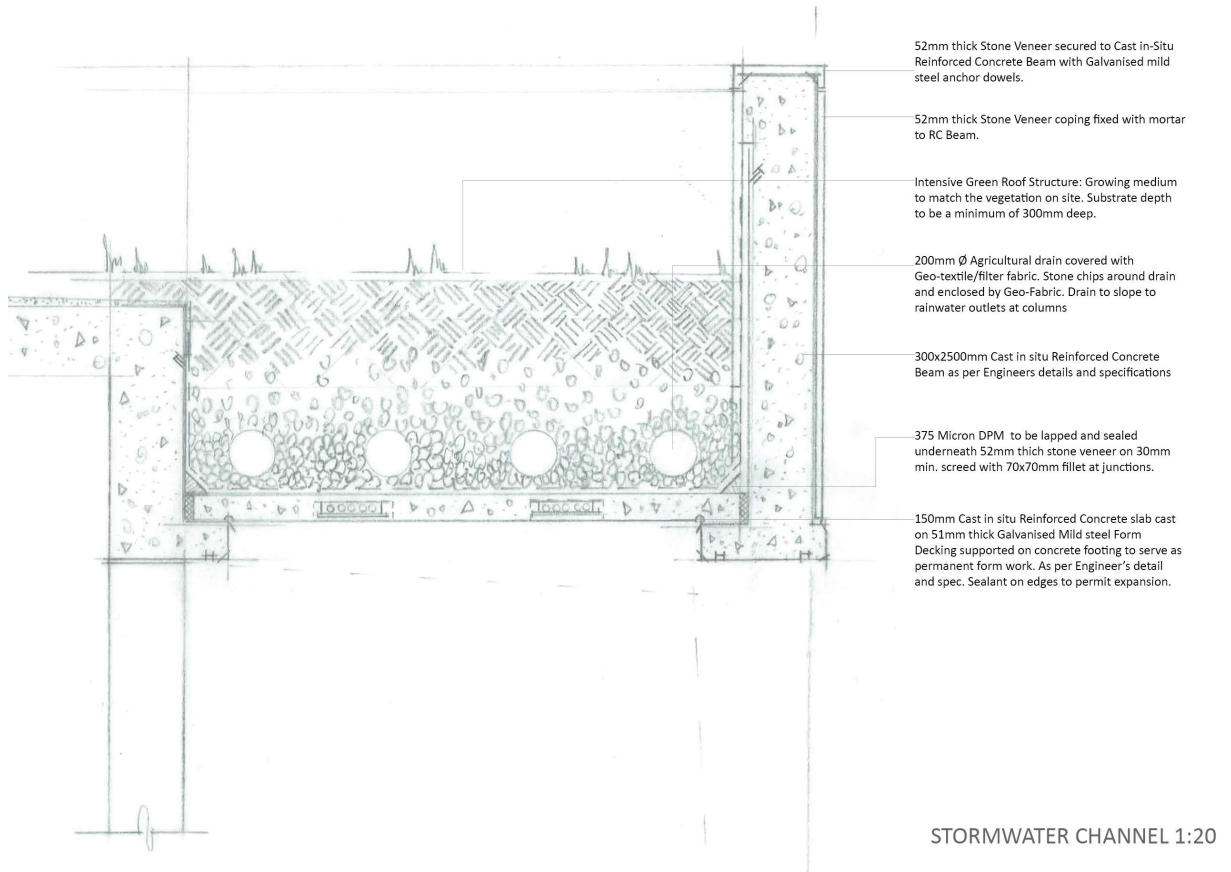
At the summit of the hill, there is no opportunity to capture run-off water from adjacent sites.

Thus, the design aims to slow down storm water and filter it, before tapping off portions of it for the use within the building.

The filtration process occurs within the terraces such that the water is cleared from any debris or dirt before slowly being released back into the water table. This is done through a series of connected sub-surface flow wetlands that align themselves with the ramps. This breaks the rigidity of the ramps and provides an opportunity to highlight the scarcity of water. At a higher level, the columns of the main structure act to transport water down and are detailed across. This is done to disperse water effectively from the green roof above. Maintenance and accessibility are also considered.





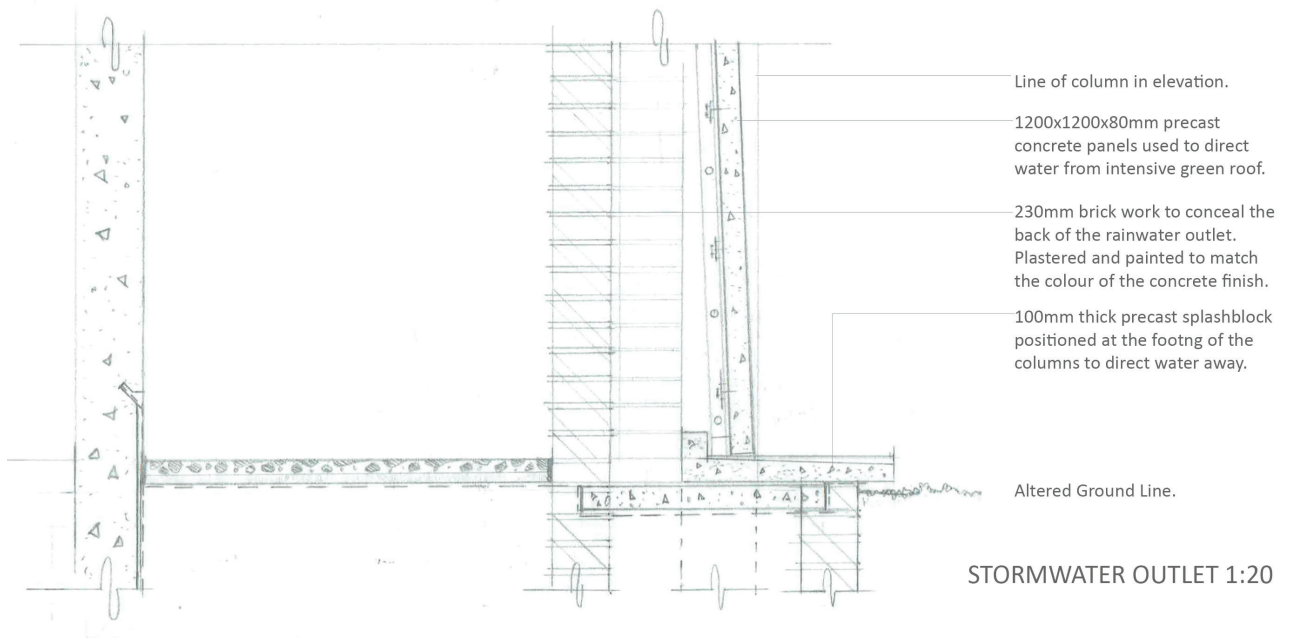
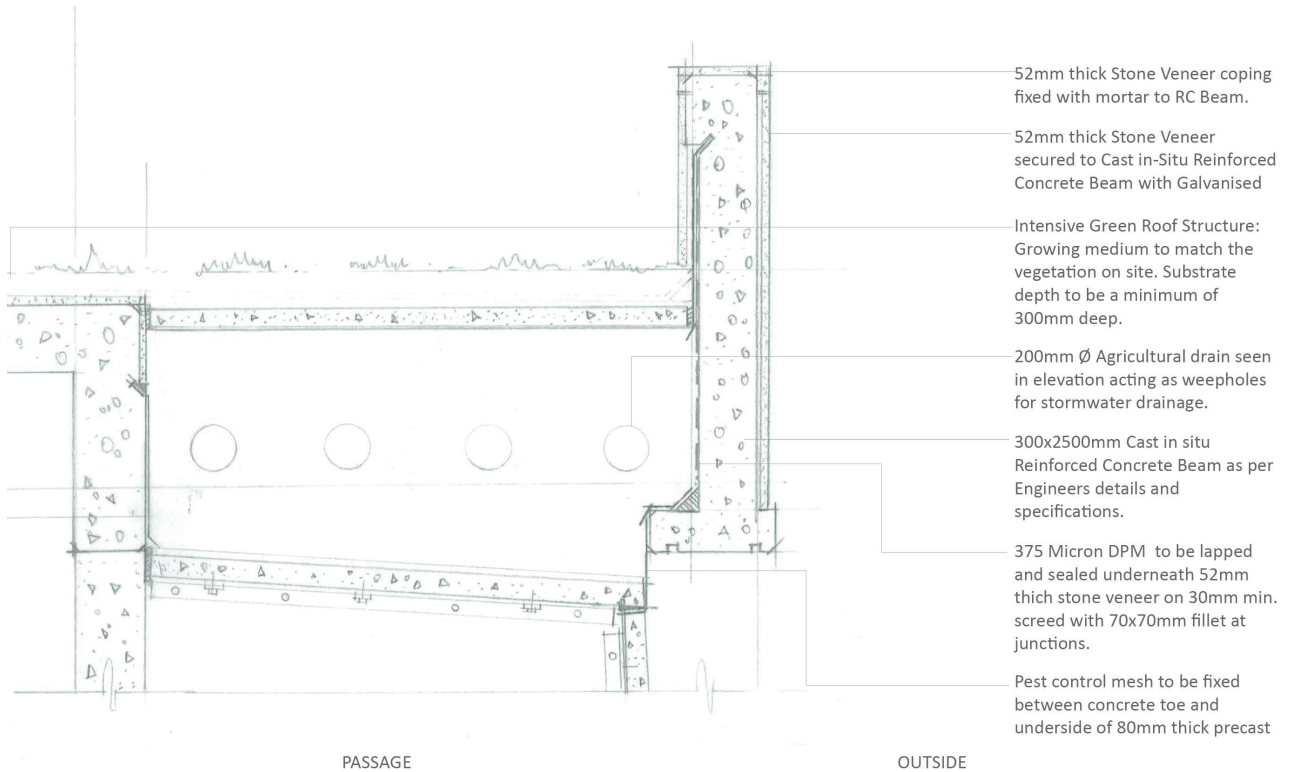


## 7.2.1 WATER TREATMENT

*Highlighting the collection of water*

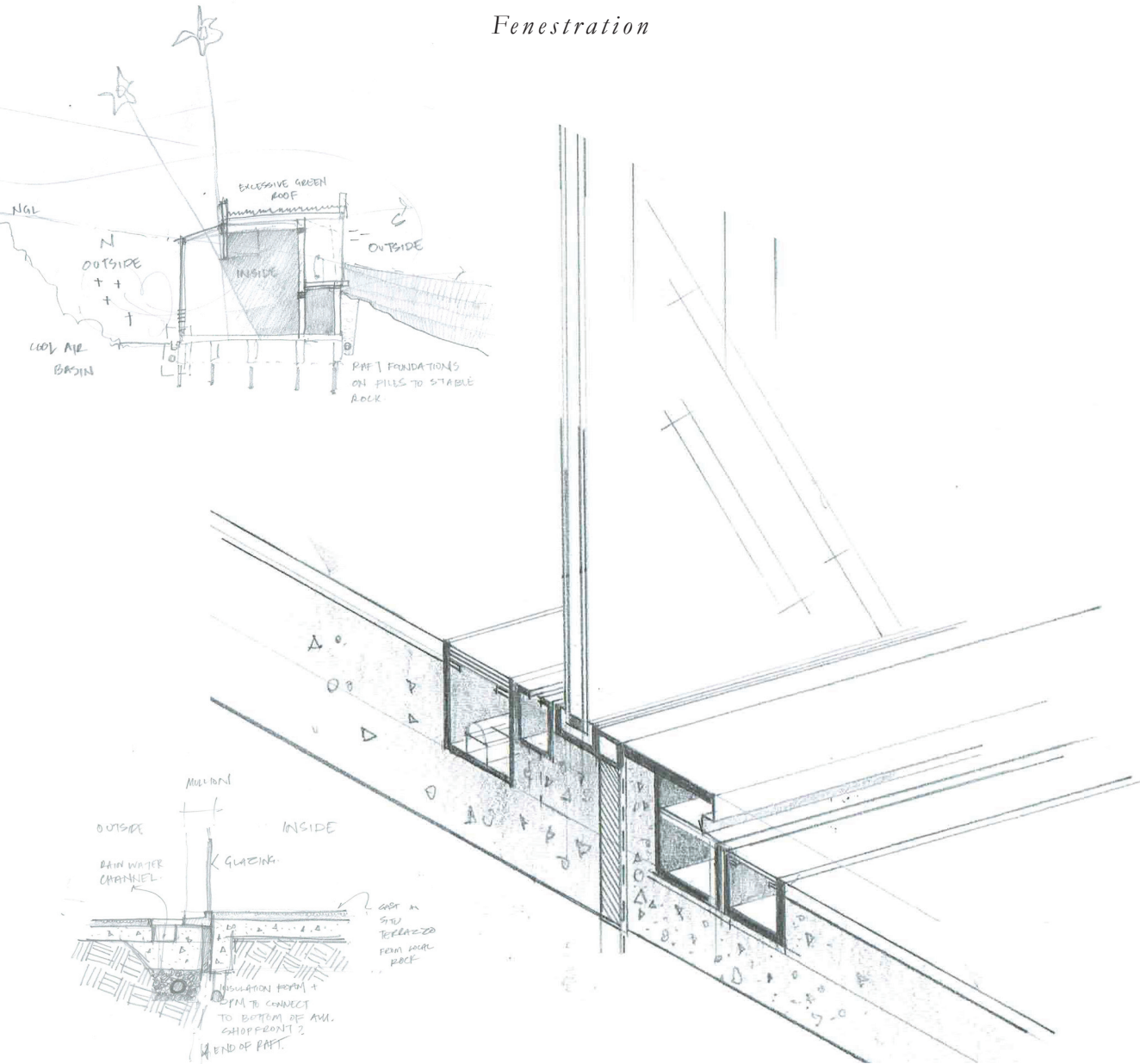
**Fig.133.** Filtration and discharge. Filtration occurs on this level, providing a sediment-free discharge through the use of a French drain system. Positioned at a central incline, water flows towards two opposite discharge points (as detailed on the previous page). Four drains are provided to provide a fail-safe discharge of water accumulating on the roof.

**Fig.134.** Highlighting water. On the opposite page the discharge points can be seen in elevation as weep holes, topped with a precast concrete lid above the column. The lid retains a portion of the growing medium whilst remaining accessible for service. The weep holes discharge onto an angled concrete panel that allows the water to drain until it meets the splash block, where it is then collected via underground pipes.

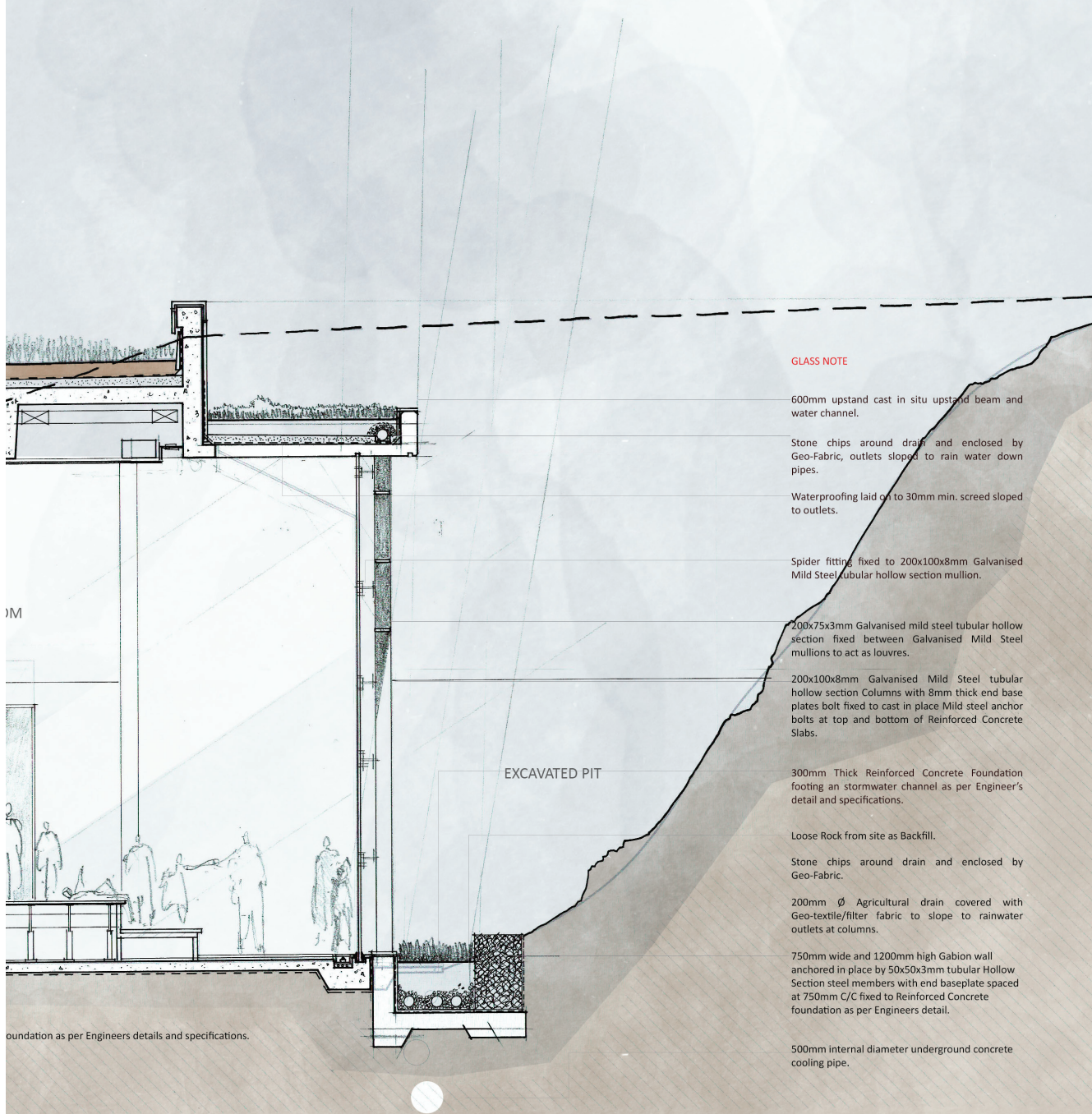


## 7.3 LIGHT

### *Fenestration*



FLUSH GLAZING DETAIL 1:10



**GLASS NOTE**

600mm upstand cast in situ upstand beam and water channel.

Stone chips around drain and enclosed by Geo-Fabric, outlets sloped to rain water down pipes.

Waterproofing laid out to 30mm min. screed sloped to outlets.

Spider fitting fixed to 200x100x8mm Galvanised Mild Steel tubular hollow section mullion.

200x75x3mm Galvanised mild steel tubular hollow section fixed between Galvanised Mild Steel mullions to act as louvres.

200x100x8mm Galvanised Mild Steel tubular hollow section Columns with 8mm thick end base plates bolt fixed to cast in place Mild steel anchor bolts at top and bottom of Reinforced Concrete Slabs.

300mm Thick Reinforced Concrete Foundation footing an stormwater channel as per Engineer's detail and specifications.

Loose Rock from site as Backfill.

Stone chips around drain and enclosed by Geo-Fabric.

200mm Ø Agricultural drain covered with Geo-textile/filter fabric to slope to rainwater outlets at columns.

750mm wide and 1200mm high Gabion wall anchored in place by 50x50x3mm tubular Hollow Section steel members with end baseplate spaced at 750mm C/C fixed to Reinforced Concrete foundation as per Engineers detail.

500mm internal diameter underground concrete cooling pipe.

EXCAVATED PIT

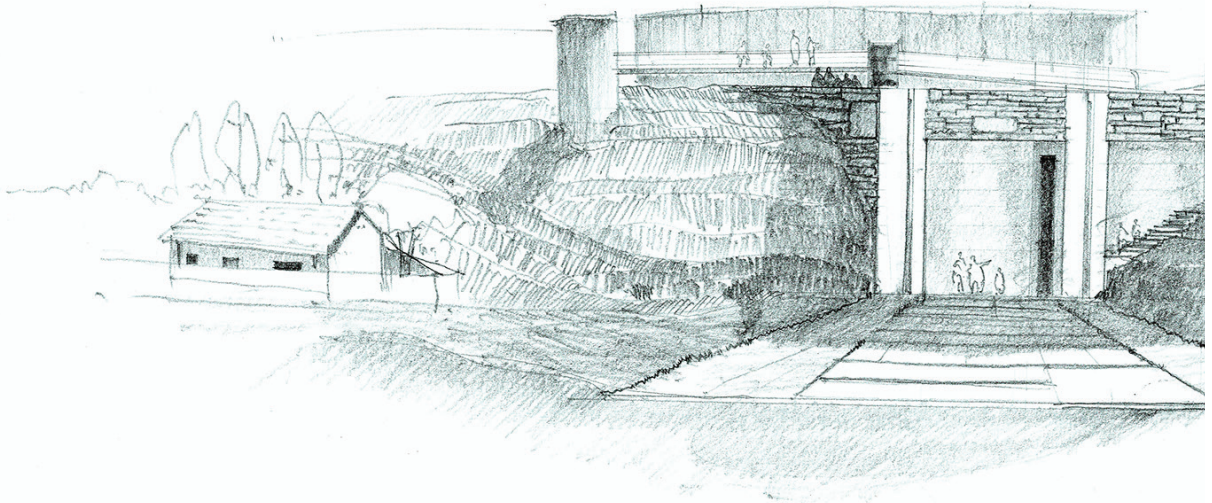
foundation as per Engineers details and specifications.

## 7.4 THE ELEVATION

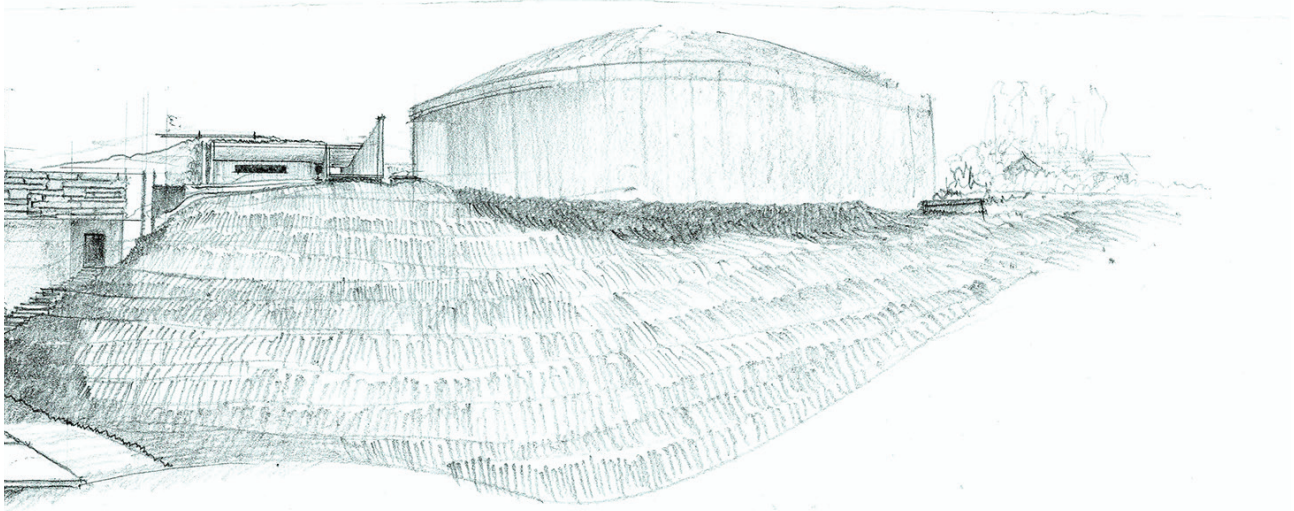
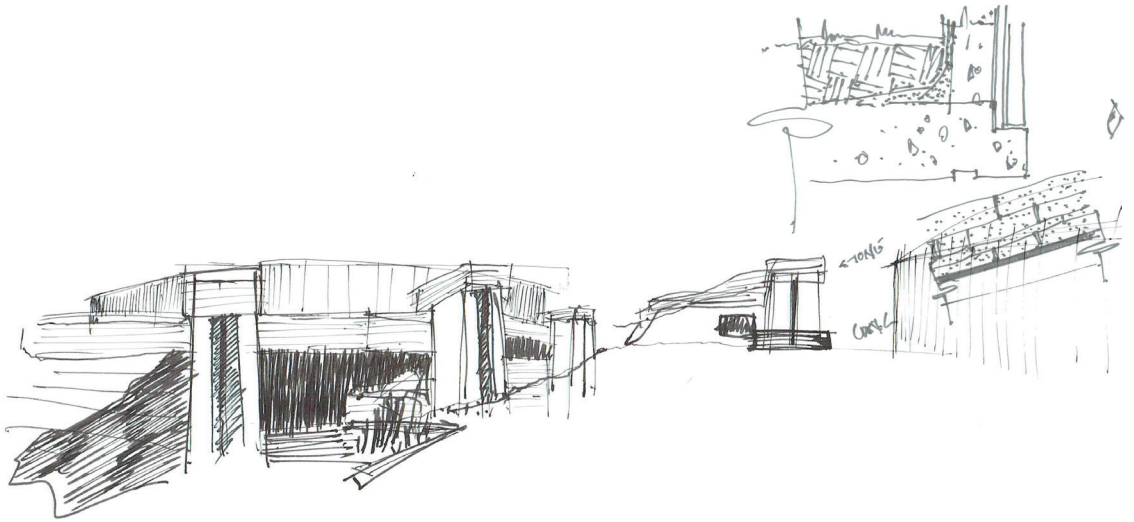
### *Articulating the facade*

**Fig.135.** The elevation.

The technical development of the elevation focuses on the cladding system used to achieve the required aesthetic. Initially envisioned as a horizontal band of stone masonry, the southern elevation suspends the rock to appear as if the building was carved out of the landscape. The elevation below illustrates how stone recycled from the earth works could be used. To achieve this, the stone would be cut to shape from larger pieces of rock. This process would require the stone to be bonded to the upstand beam due to the lack of uniformity in the size of stone. Elevation: August, 2016. Sketches: August, 2016.





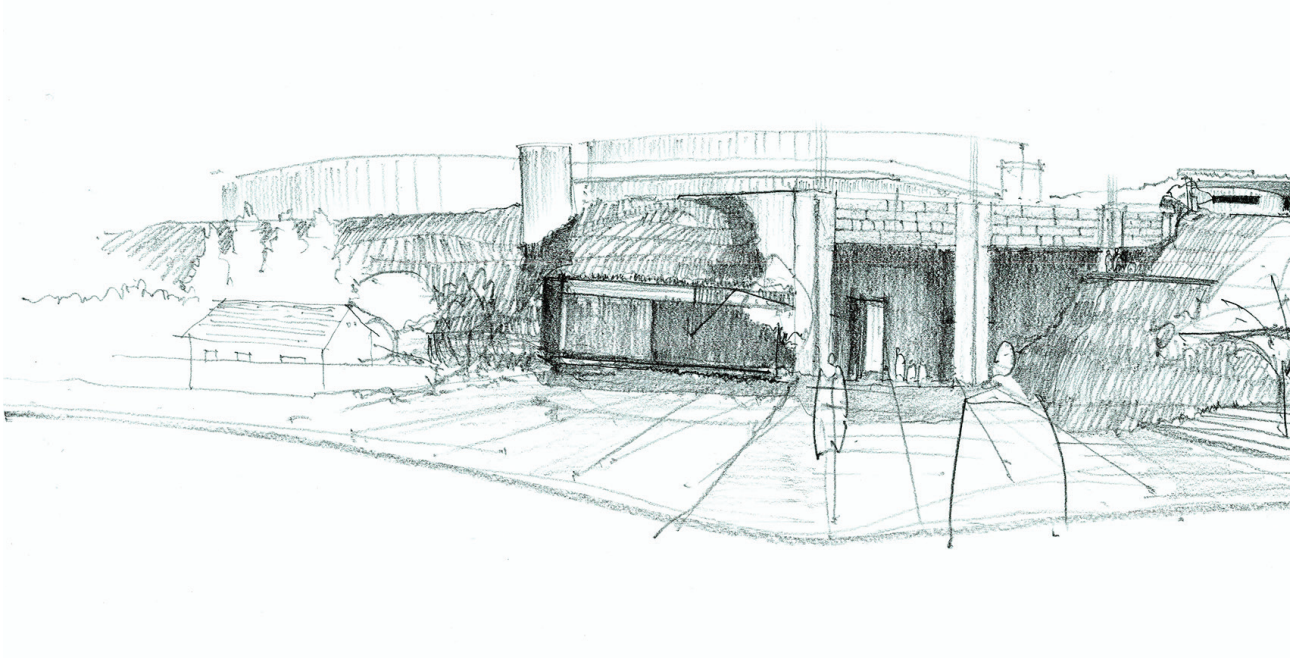


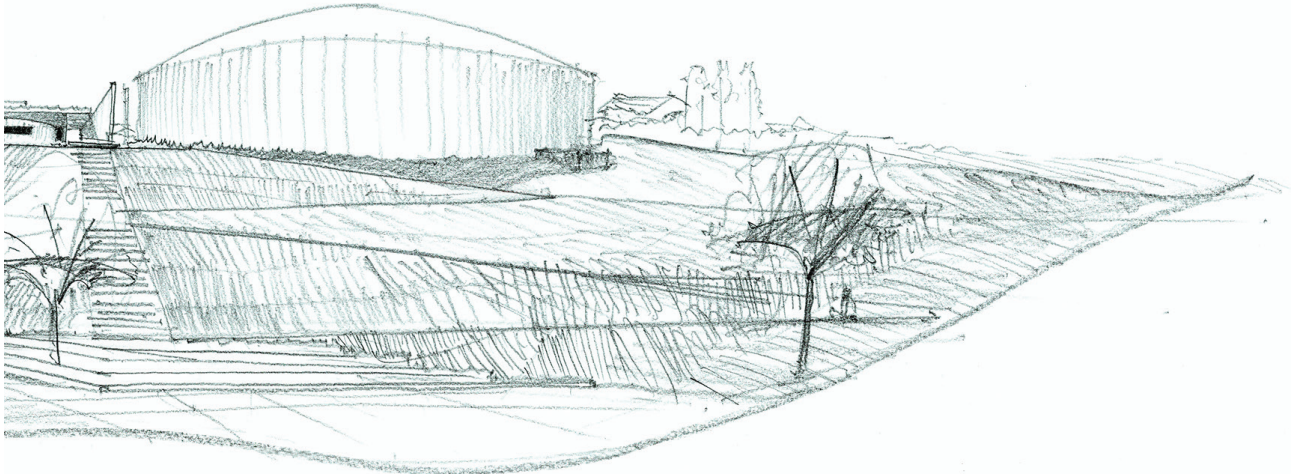
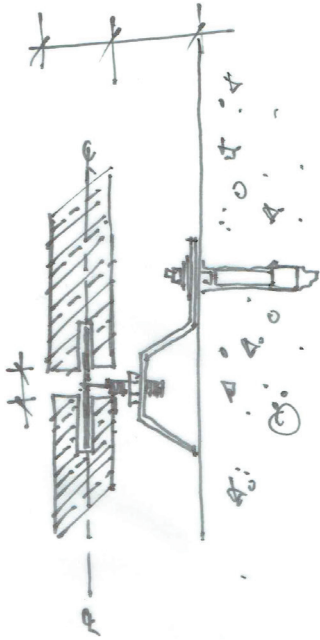
## 7.4.1 THE ELEVATION

### *Articulating the facade*

**Fig.136.** The elevation.

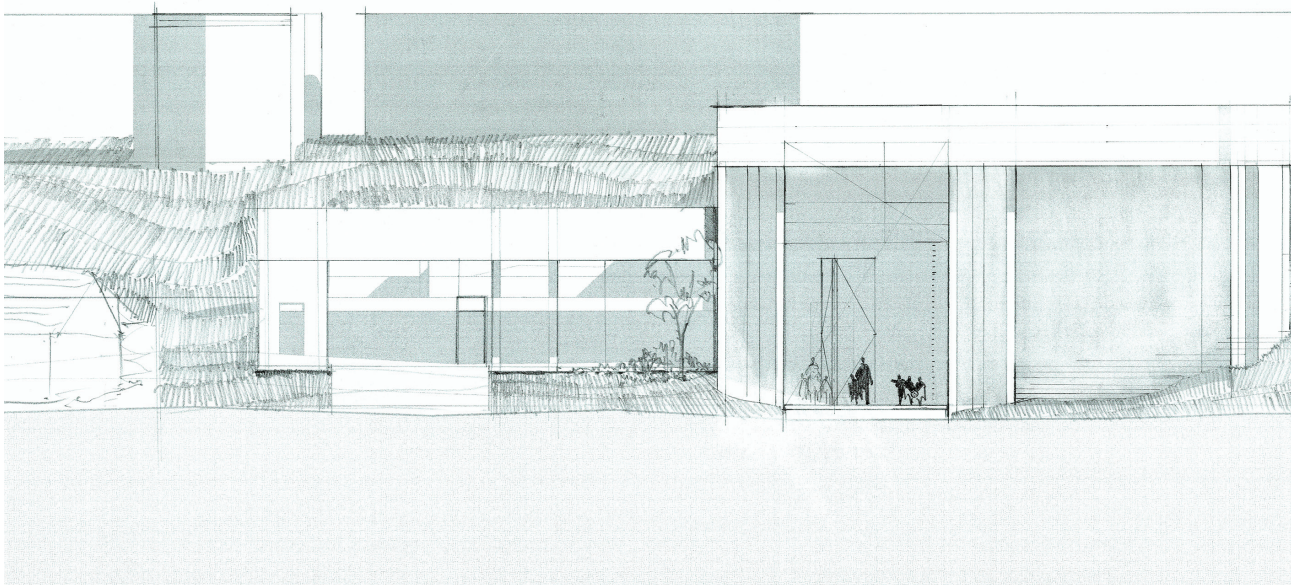
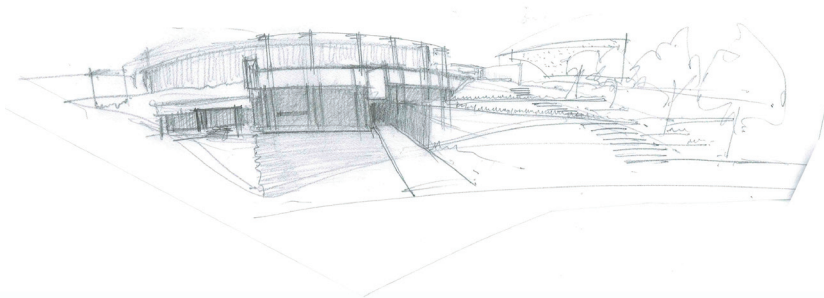
This iteration considers a uniform pattern which allows for the introduction of an anchor, allowing the stone to attach in an orderly fashion to the concrete upstand beam. Although this system would provide for ease of assembly, the process of preparing the rock might require more skilled labour and could be time consuming. Elevation: August, 2016. Details: September, 2016.

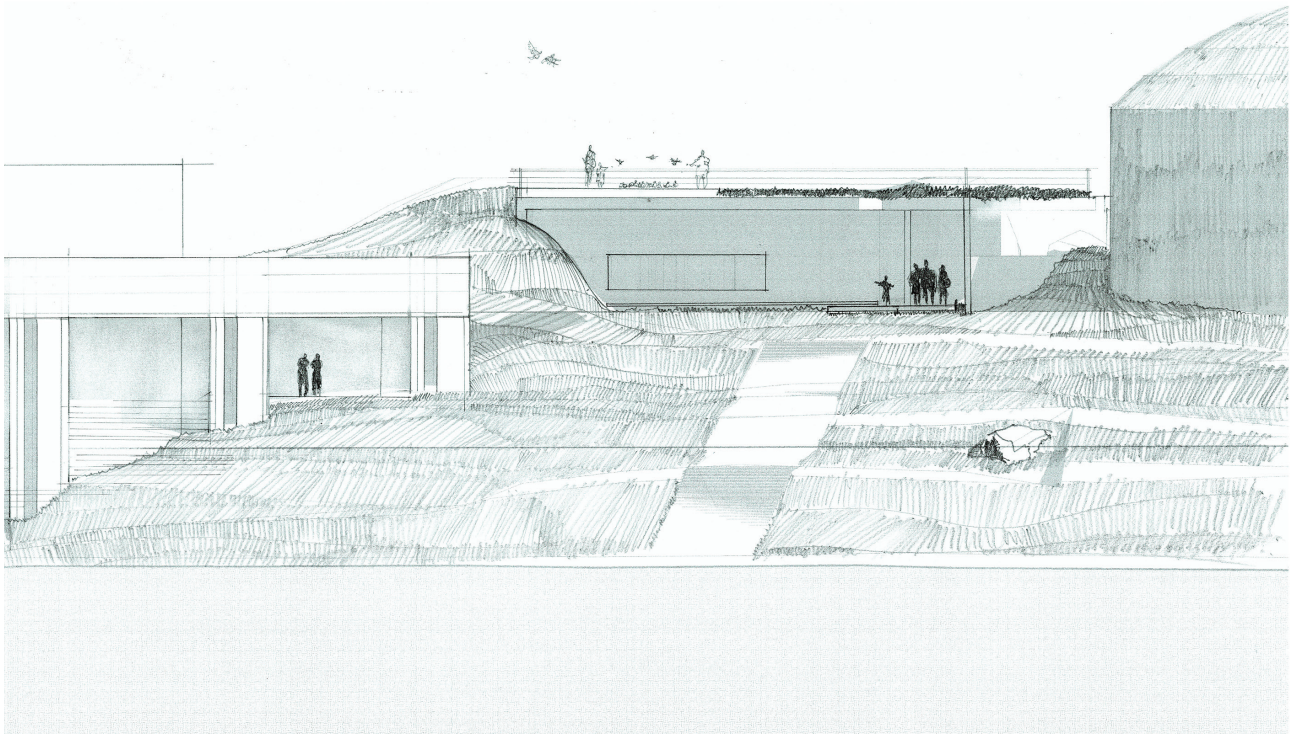
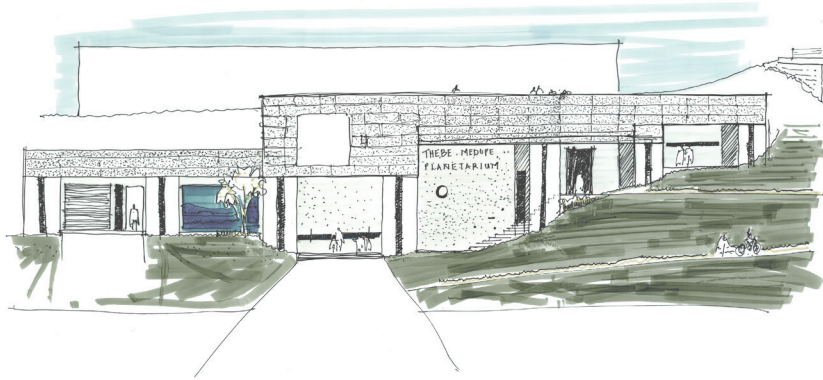




## 7.4.2 APPROACH

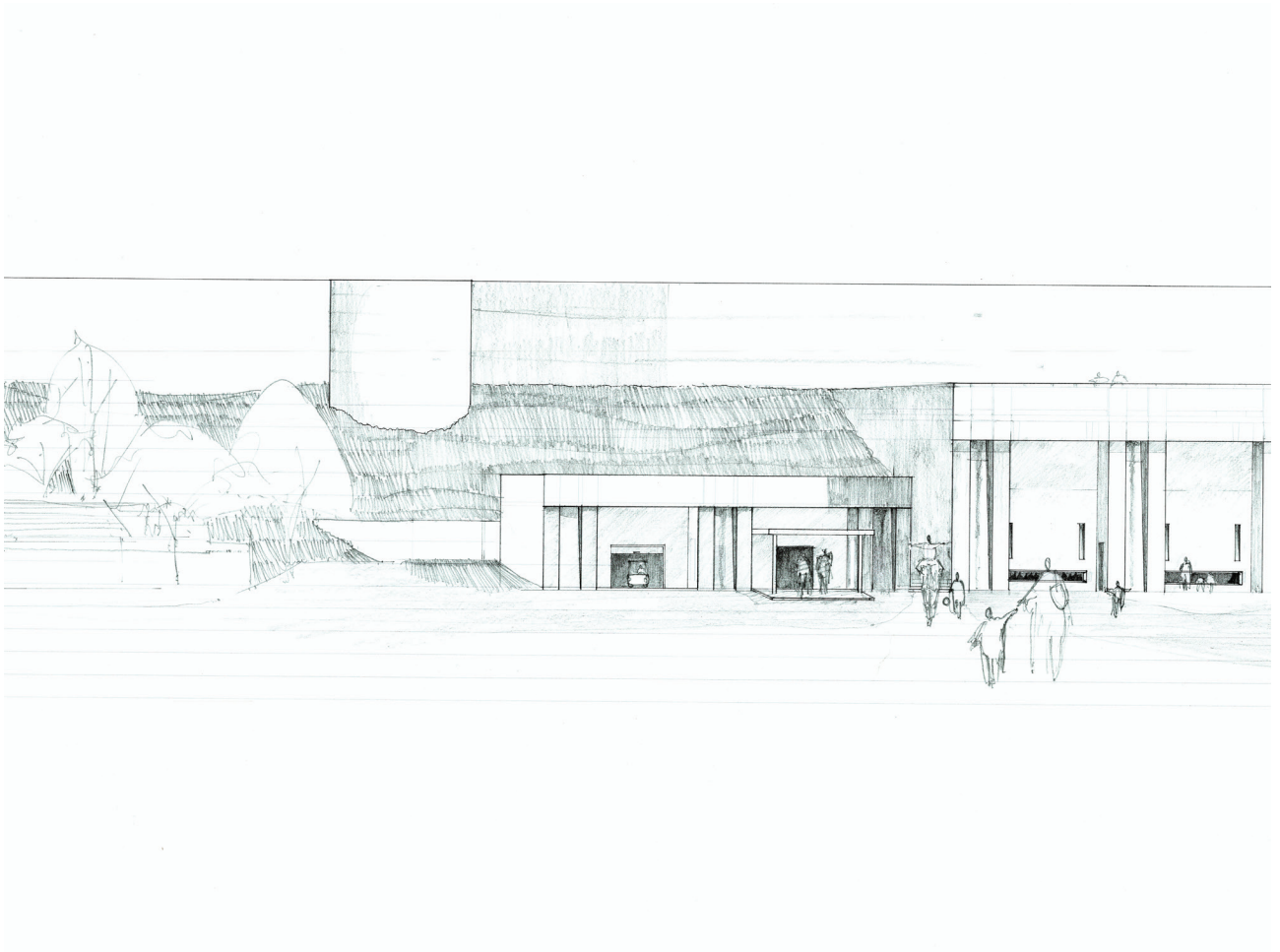
*Designing the elevation*



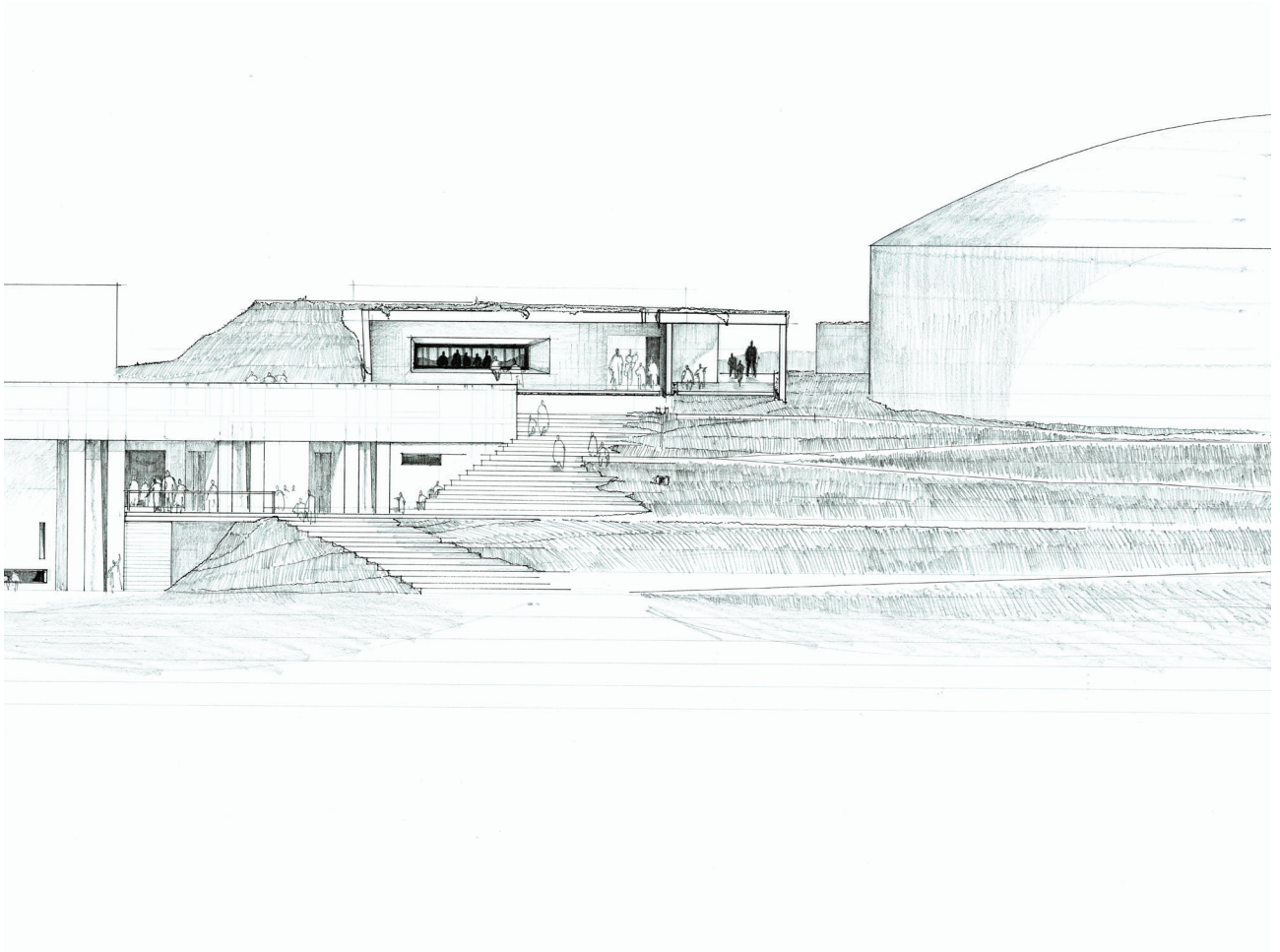


## 7.4.3 THE PLINTH

*Designing the Southern entrance*

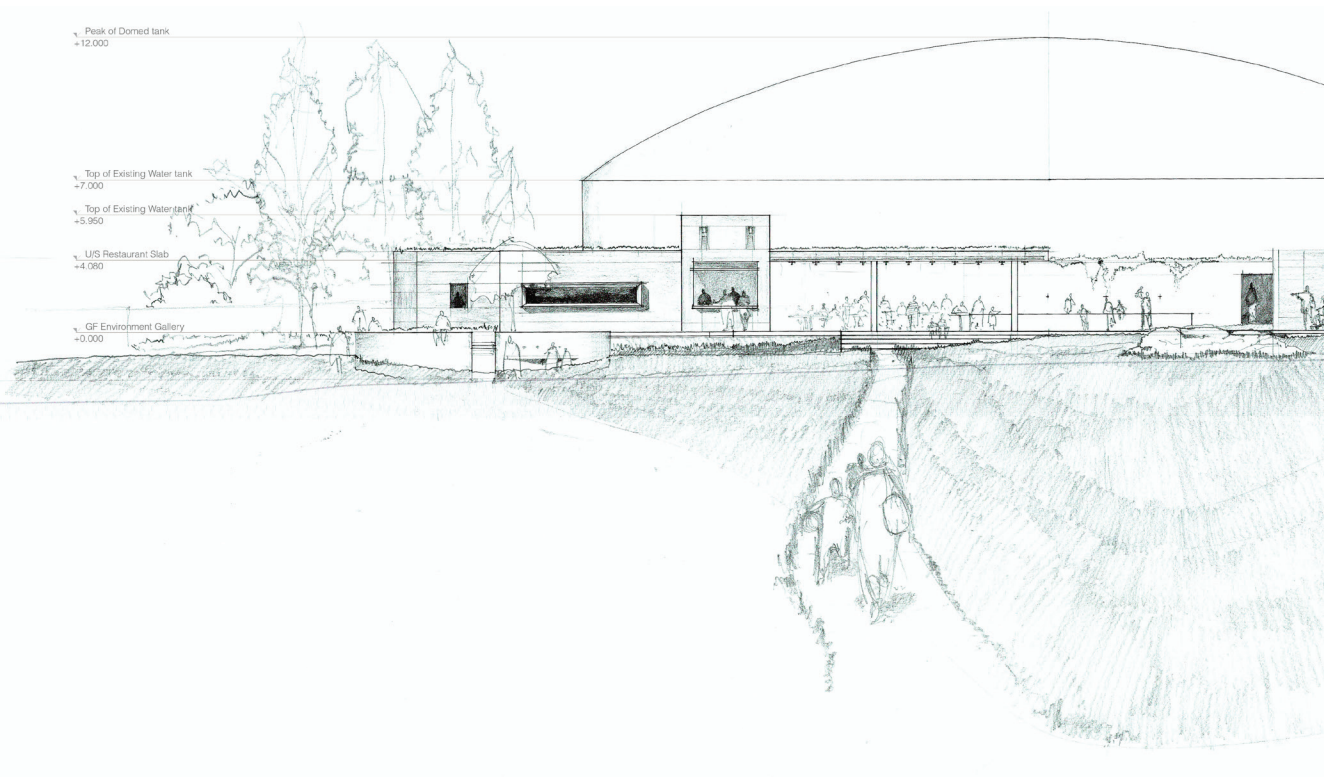


Southern Elevation NTS drawn at 1:100

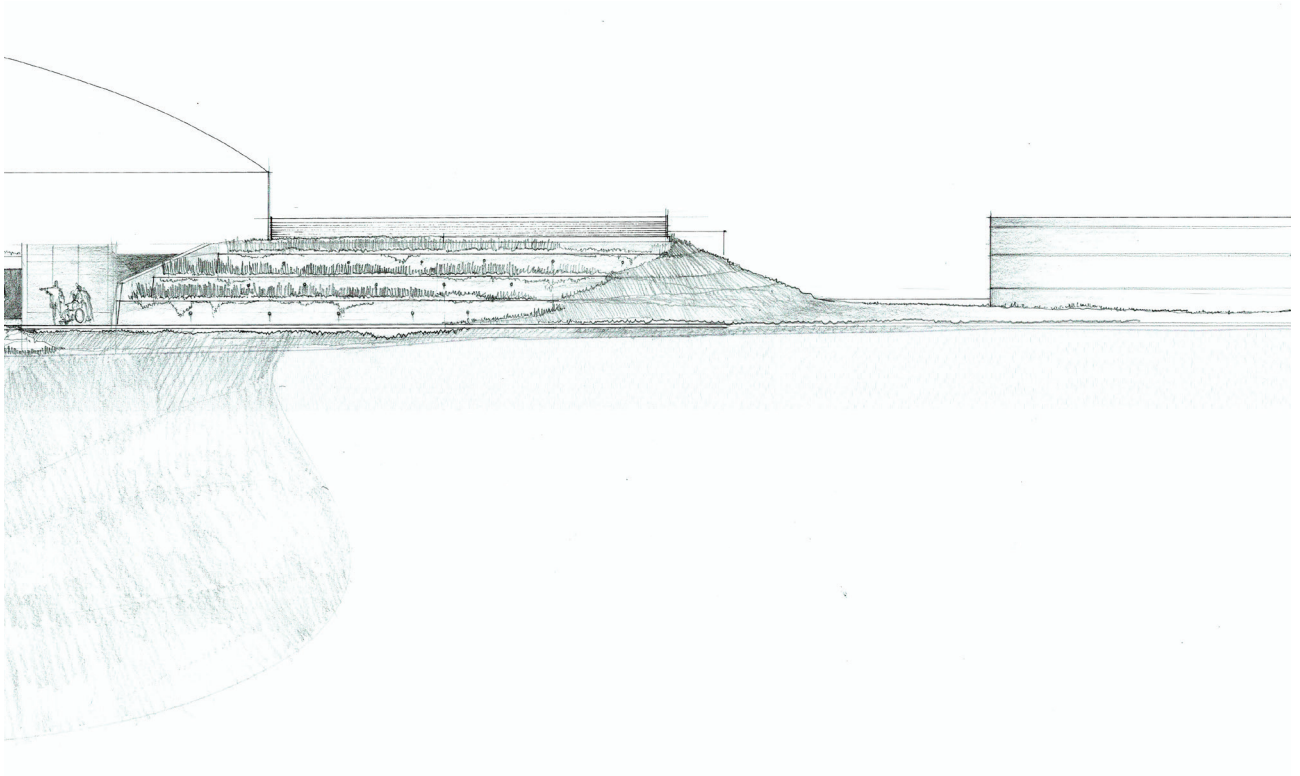


## 7.4.4 THE PARK

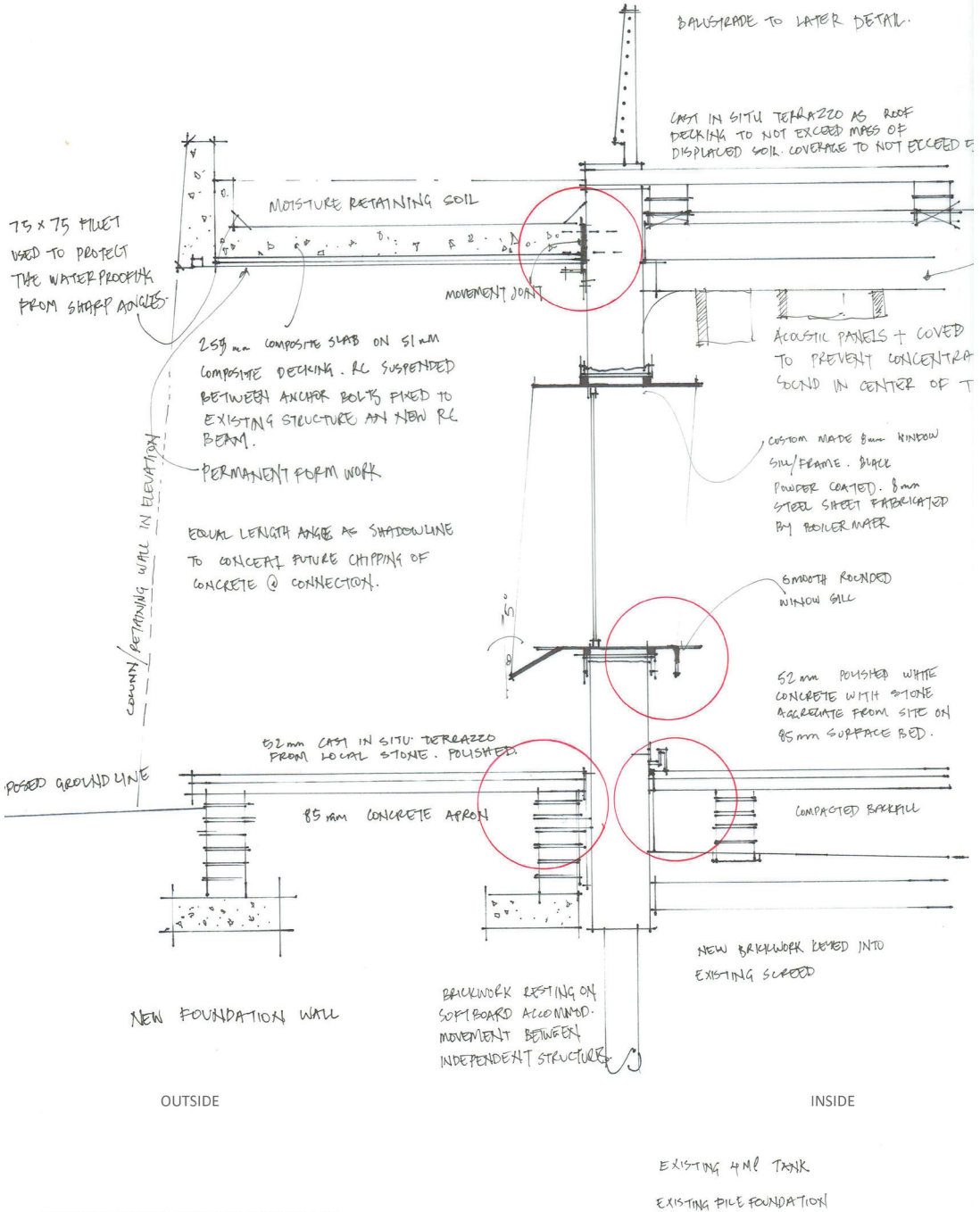
*Designing the Northern entrance*

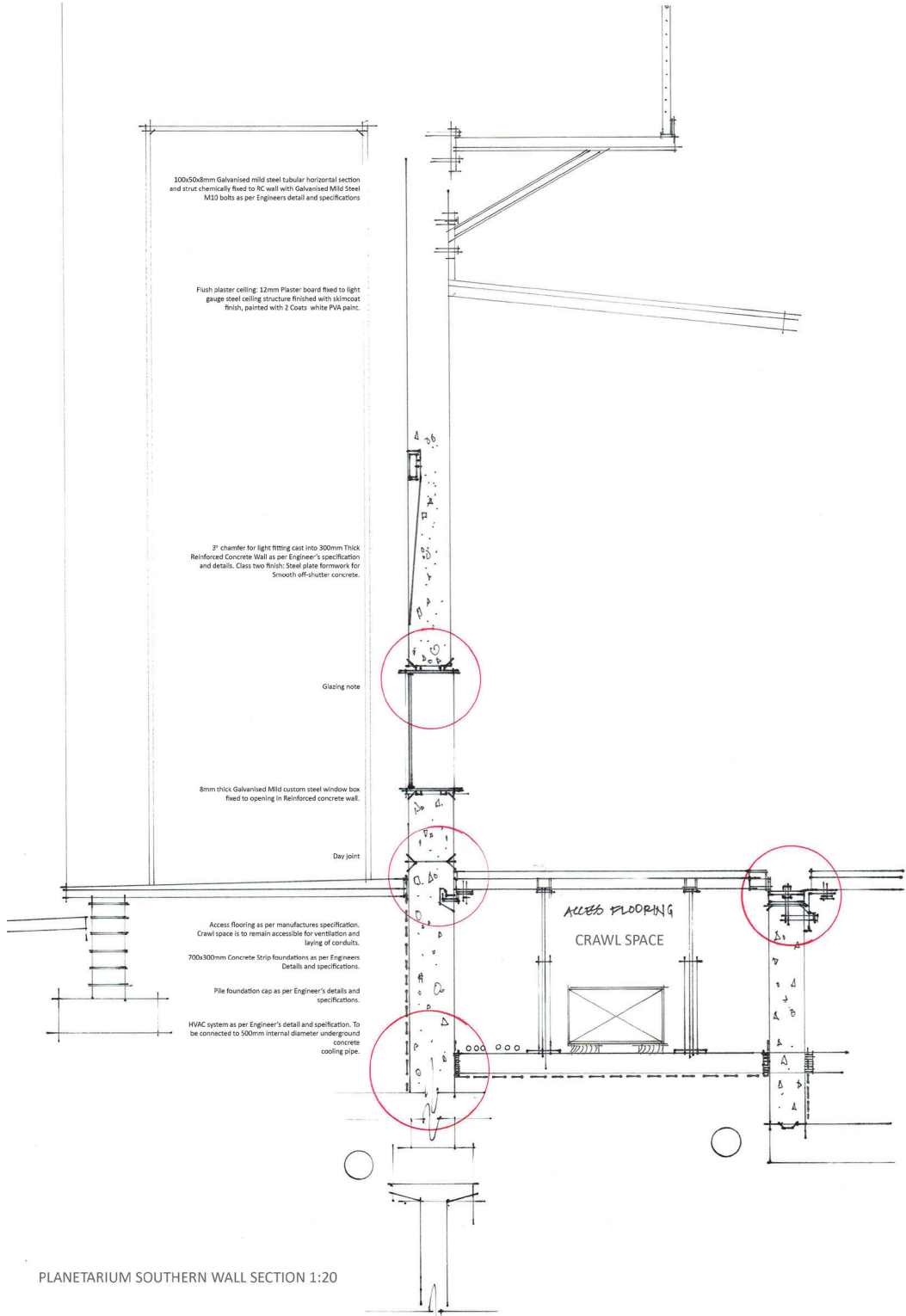






## 7.5 1:20 EXPLORATION





## 7.6 SITE PLAN

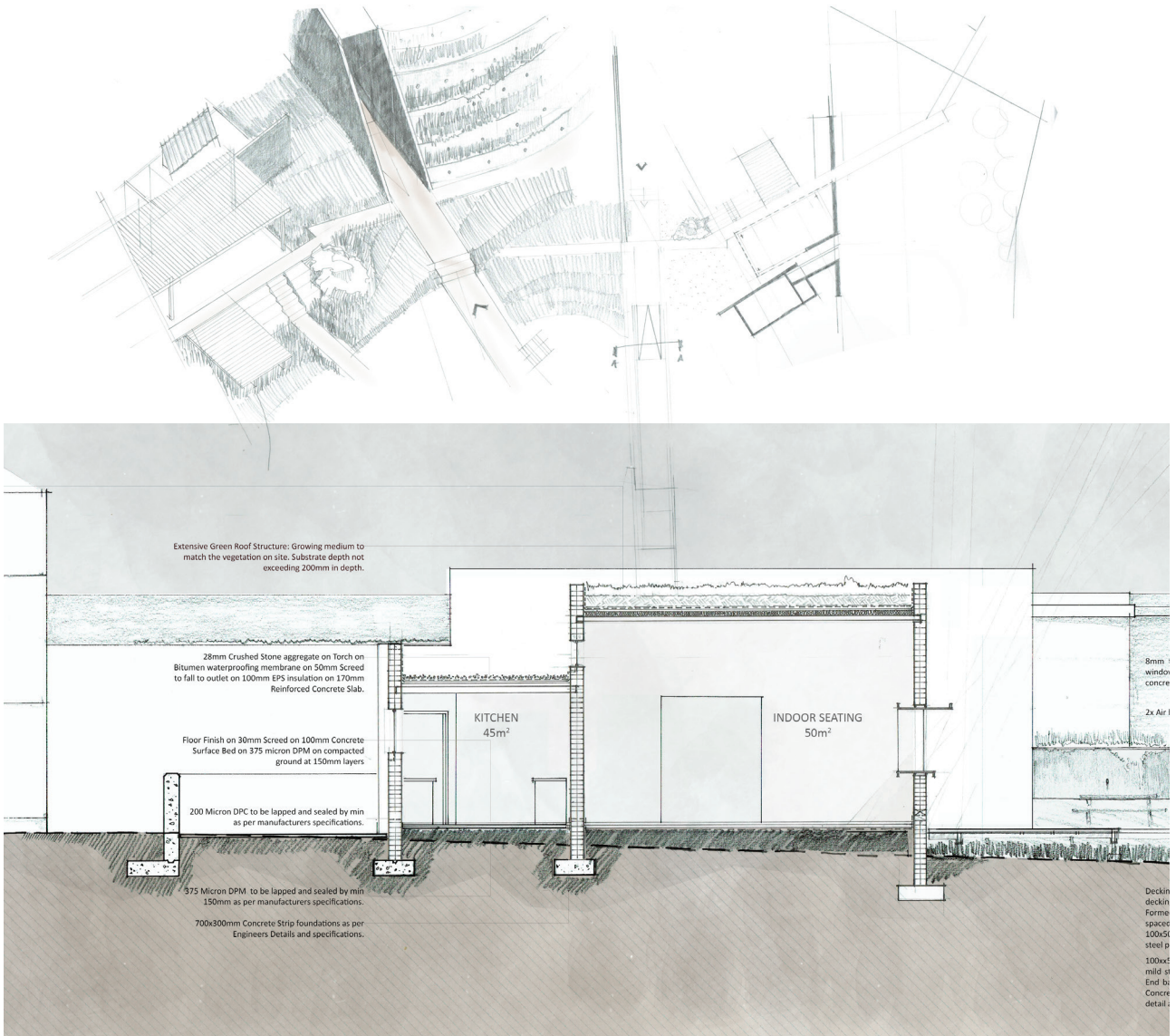
*Drawn 1:500 illustration NTS*

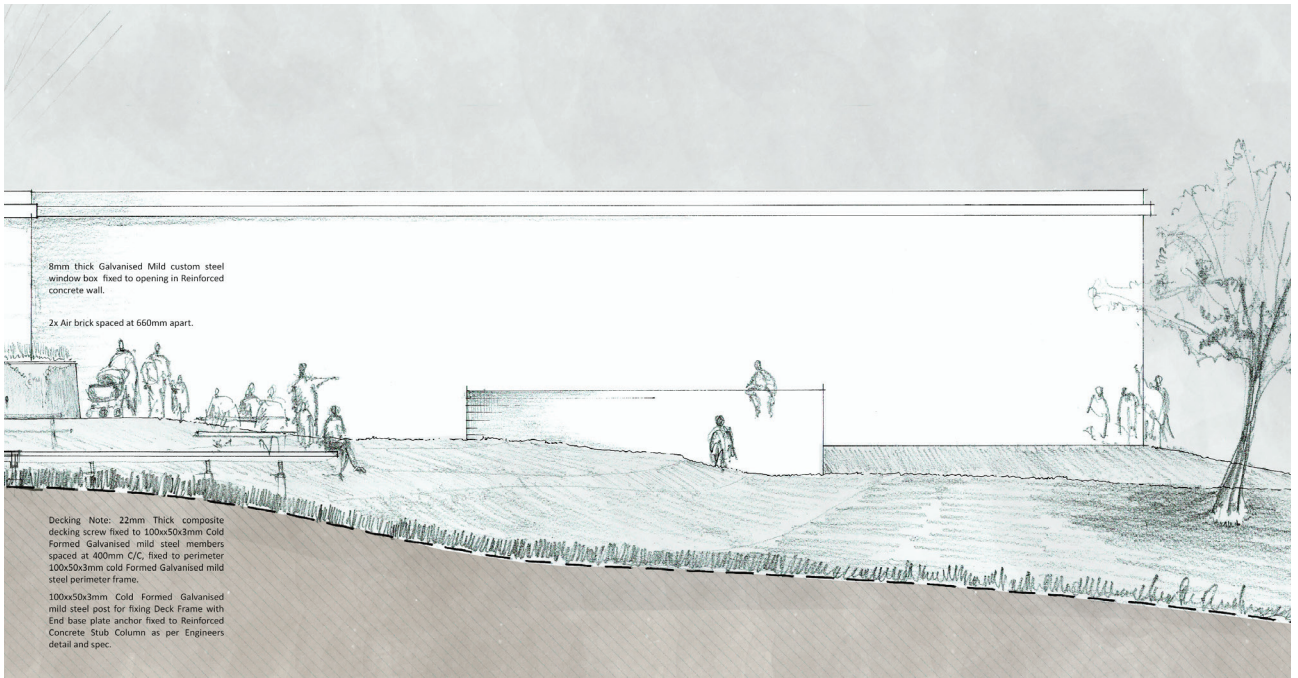
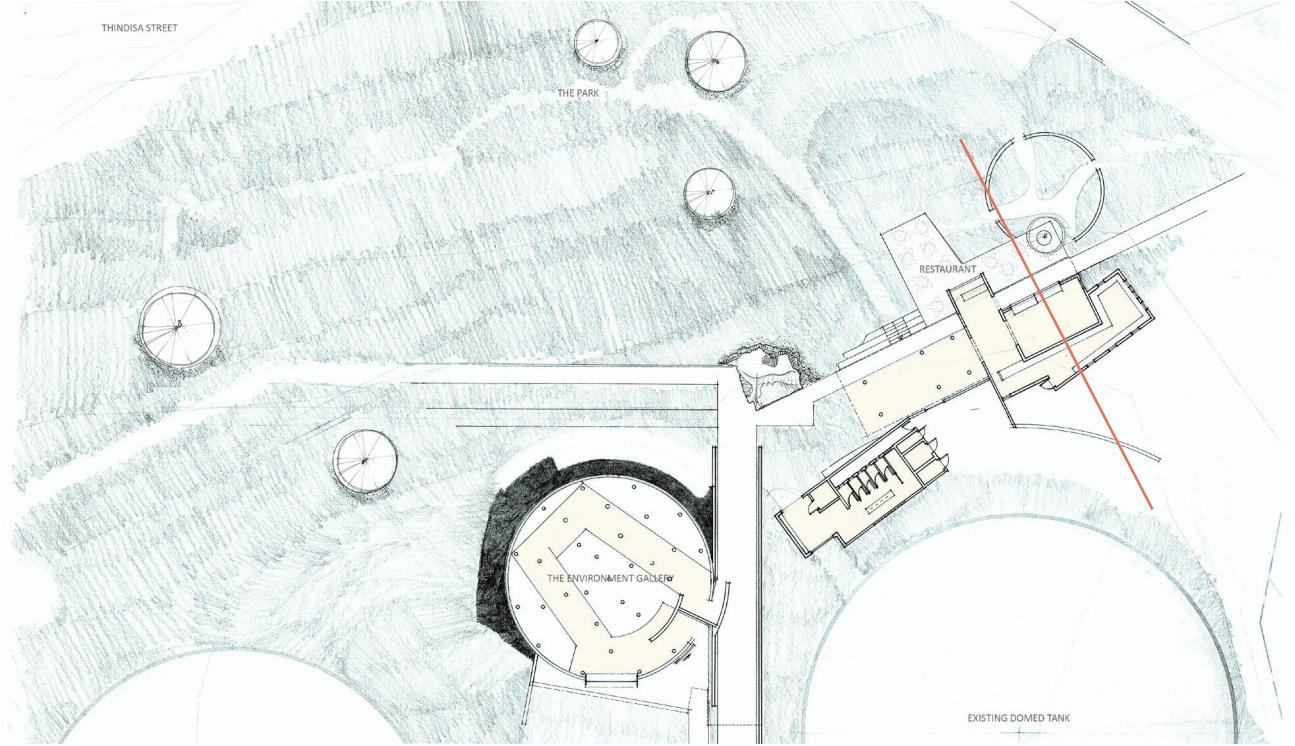




## 7.6.1 THE RESTAURANT

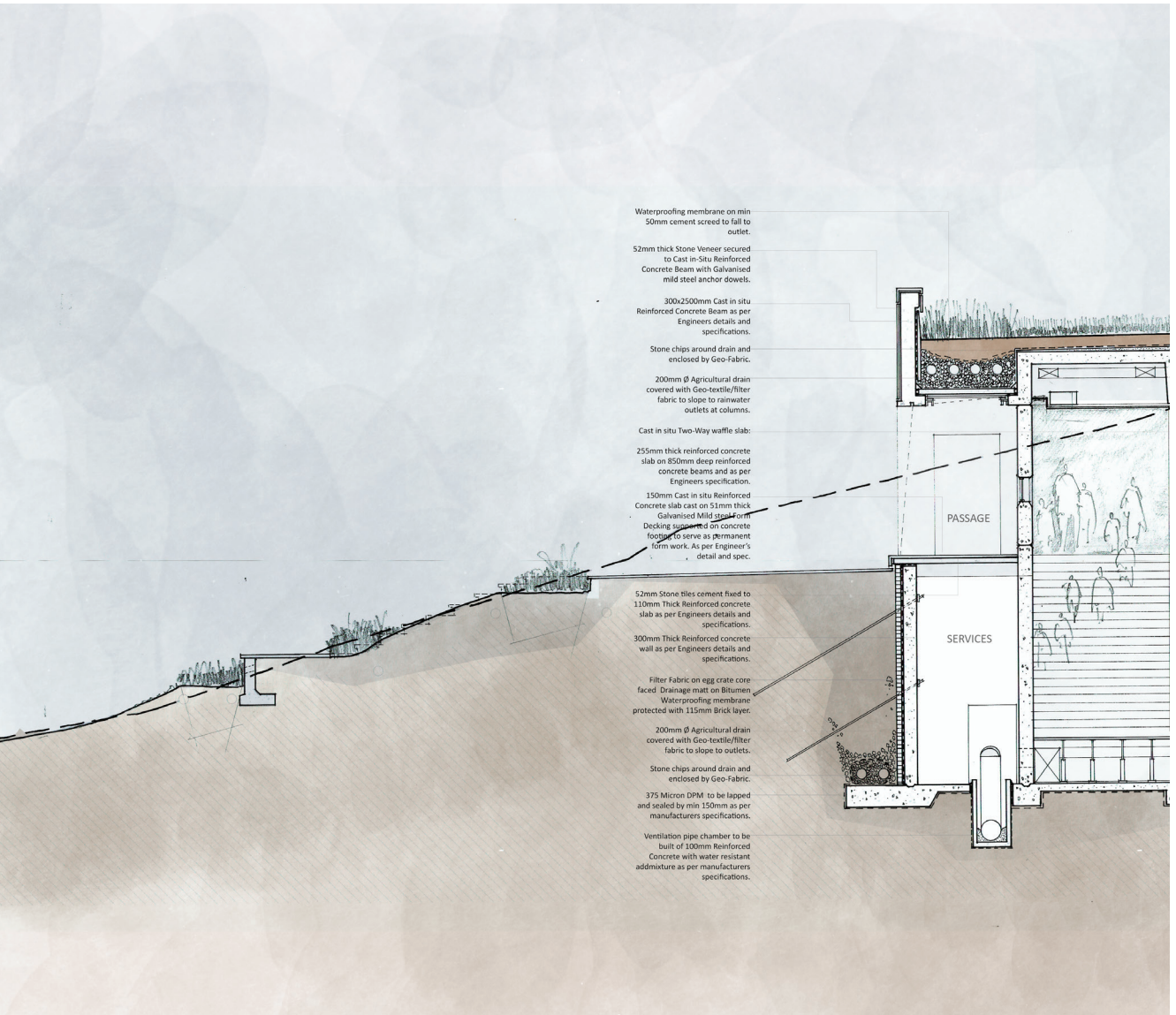
*1:50 Section illustration NTS*



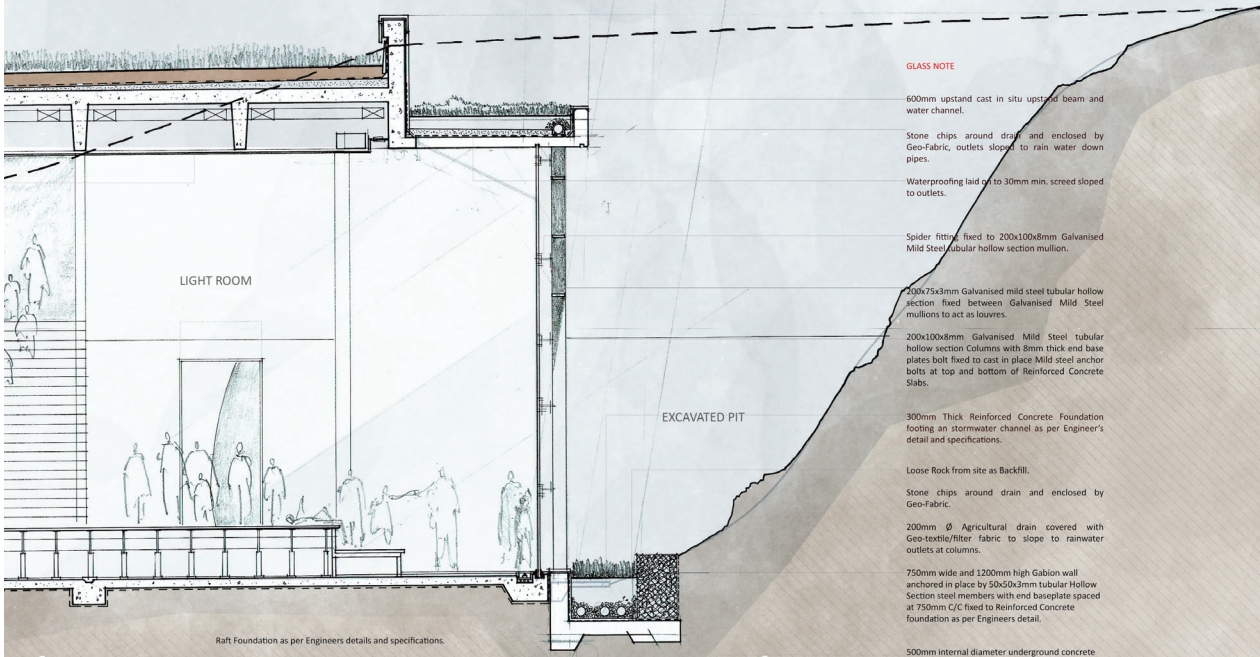
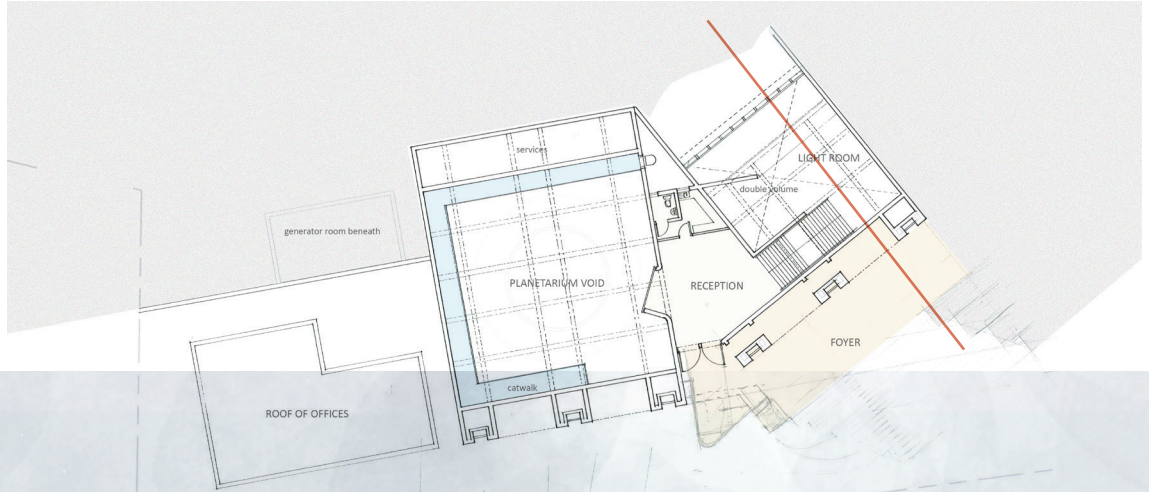


## 7.6.2 THE LIGHT ROOM

*1:50 Section illustration NTS*







**GLASS NOTE**

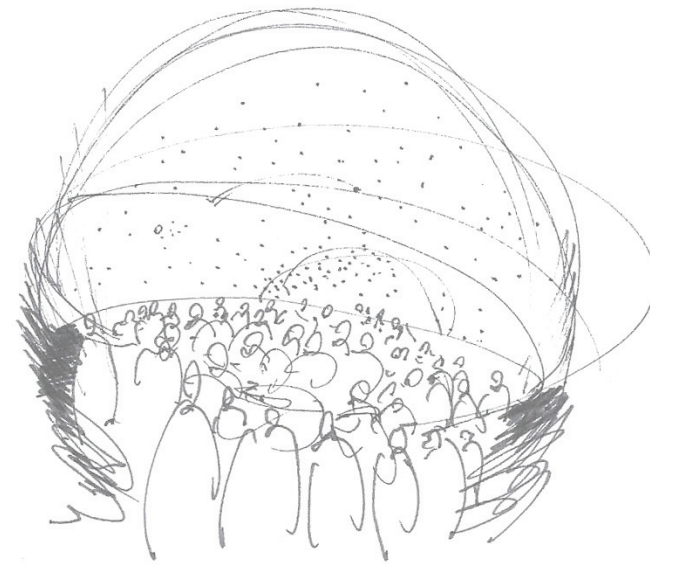
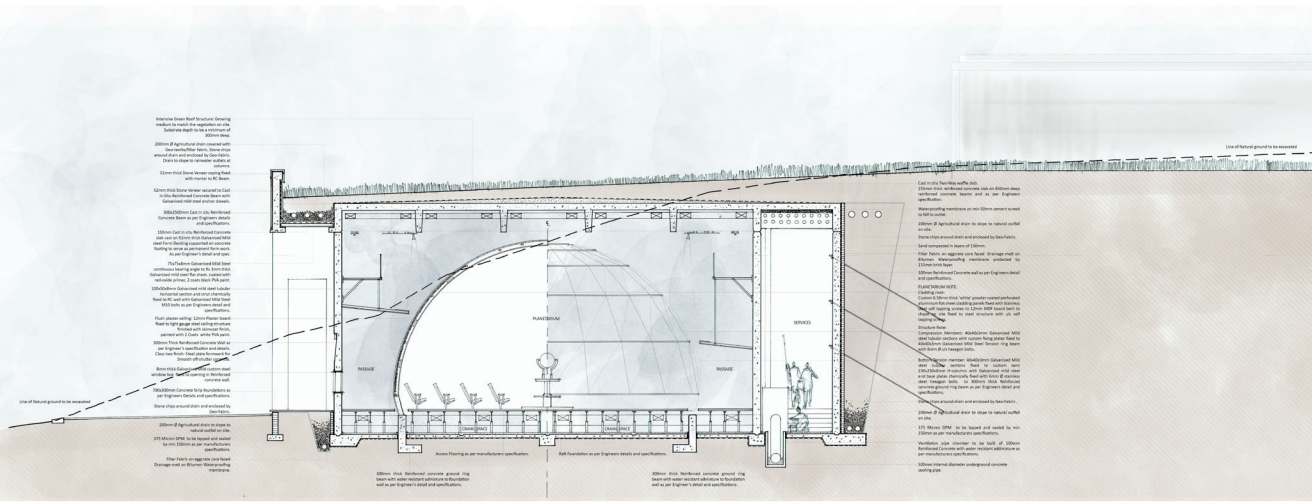
- 600mm upstand cast in situ upstays beam and water channel.
- Stone chips around drain and enclosed by Geo-Fabric, outlets sloped to rain water down pipes.
- Waterproofing laid out to 30mm min. screed sloped to outlets.
- Spider fitting fixed to 200x100x8mm Galvanised Mild Steel tubular hollow section mullion.
- 200x75x3mm Galvanised mild steel tubular hollow section fixed between Galvanised Mild Steel mullions to act as louvres.
- 200x100x8mm Galvanised Mild Steel tubular hollow section Columns with 8mm thick end base plates bolt fixed to cast in place Mild steel anchor bolts at top and bottom of Reinforced Concrete Slabs.
- 300mm Thick Reinforced Concrete Foundation footing a stormwater channel as per Engineer's detail and specifications.
- Loose Rock from site as Backfill.
- Stone chips around drain and enclosed by Geo-Fabric.
- 200mm Ø Agricultural drain covered with Geo-textile/filter fabric to slope to rainwater outlets at columns.
- 750mm wide and 1200mm high Gabion wall anchored in place by 50x50x3mm tubular Hollow Section steel members with end baseplate spaced at 750mm C/C fixed to Reinforced Concrete foundation as per Engineers detail.
- 500mm internal diameter underground concrete cooling pipe.

Raft Foundation as per Engineers details and specifications.



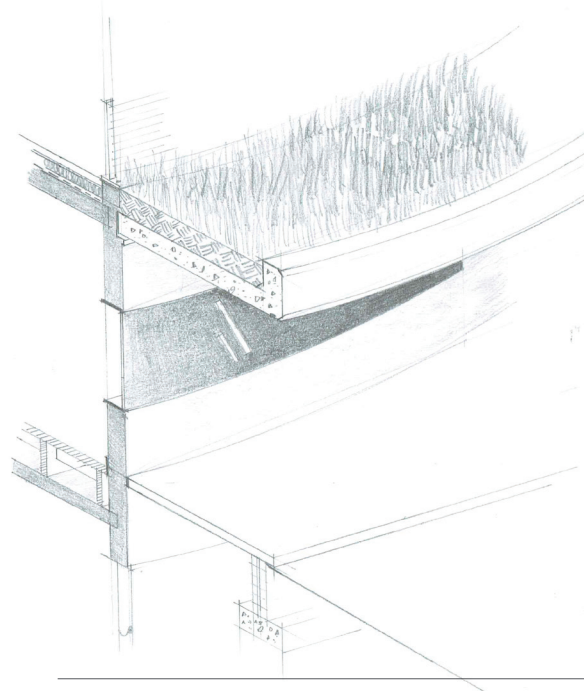
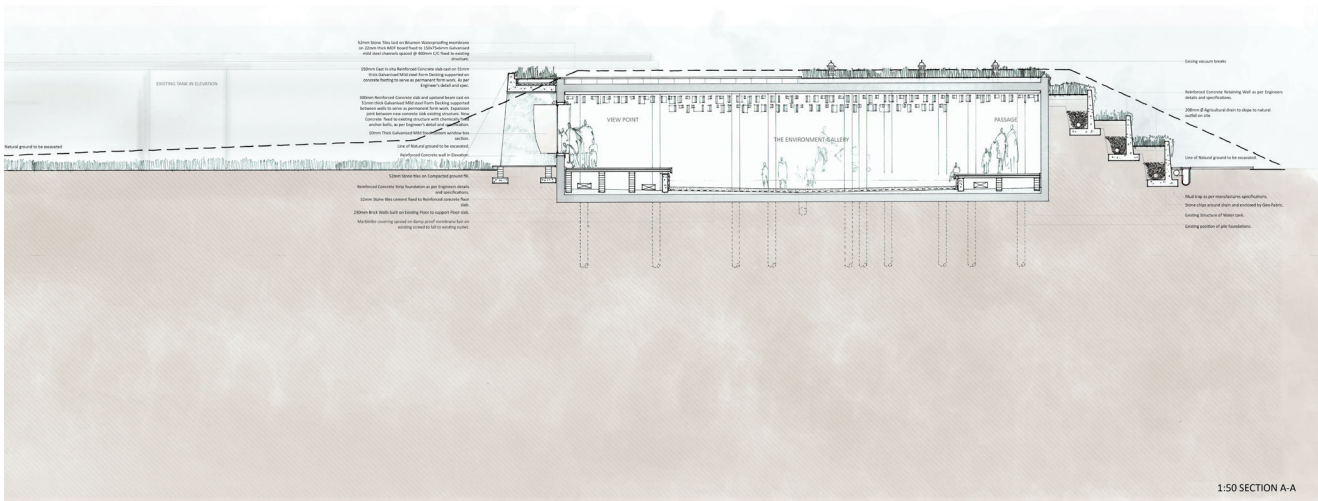
# 7.6.3 PLANETARIUM

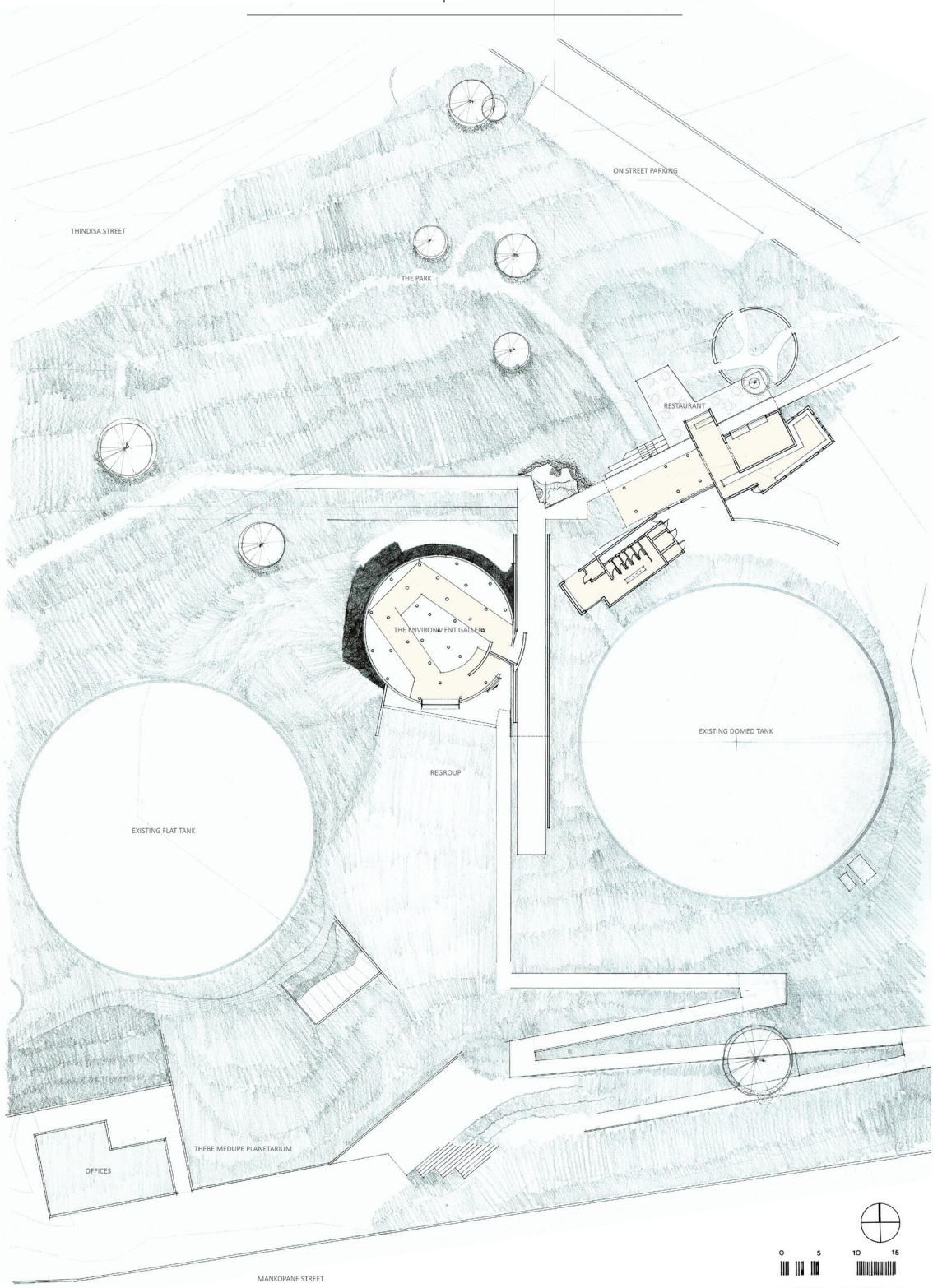
## 1:50 Section illustration NTS



## 7.6.4 ENVIRONMENT GALLERY

*1:50 Section illustration NTS*

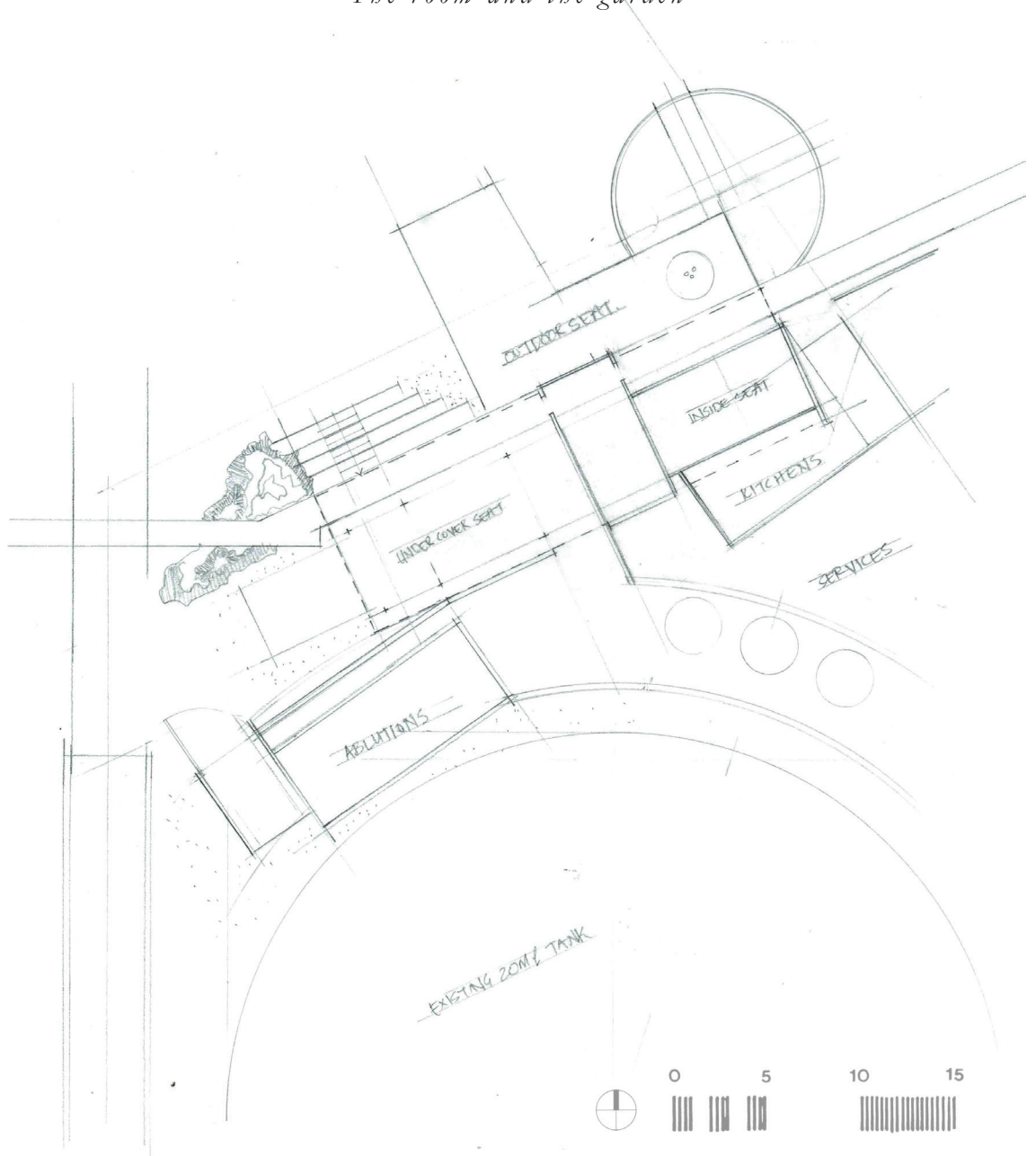




1:200 RESTAURANT PLAN

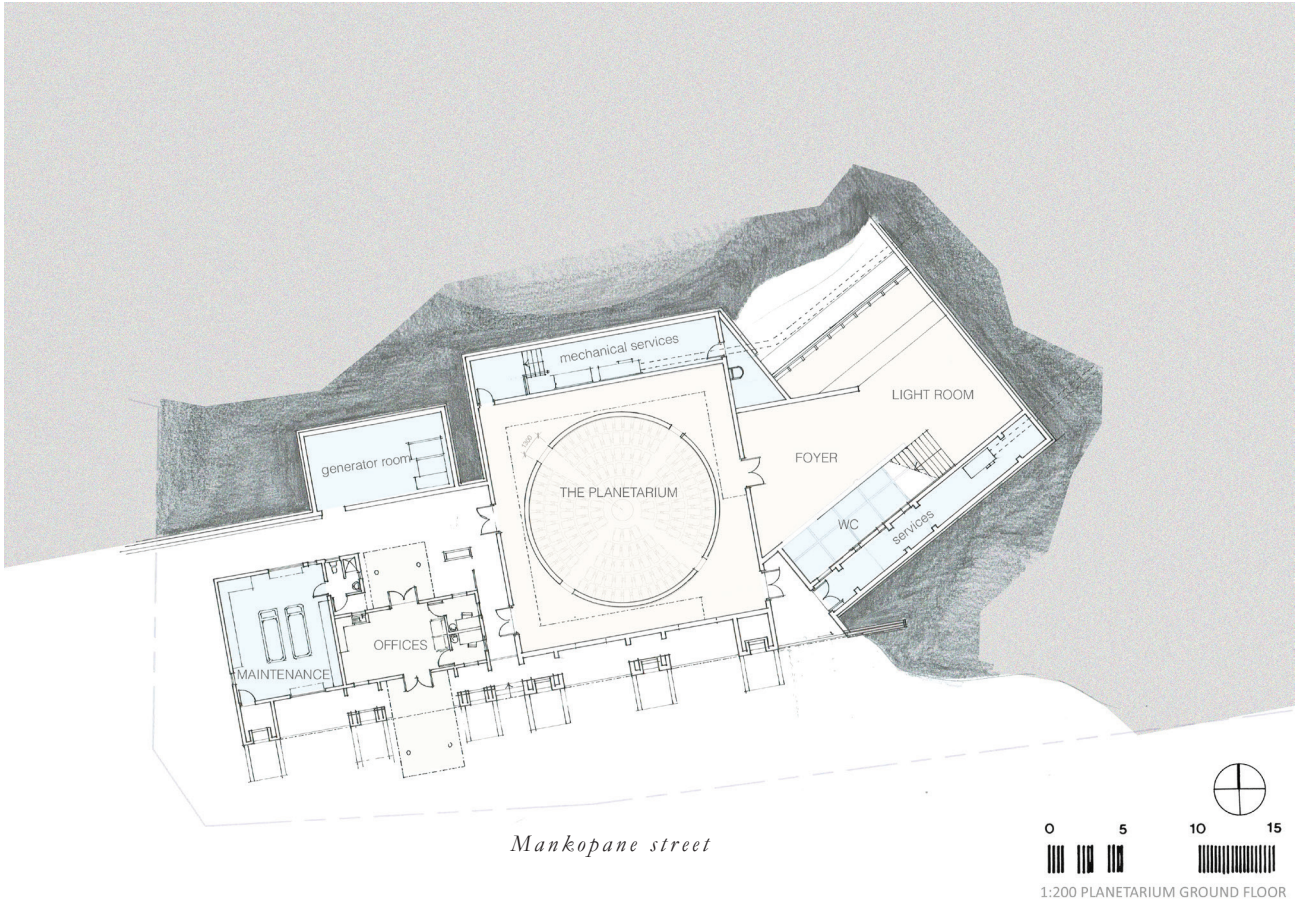
## 7.6.5 PLANS

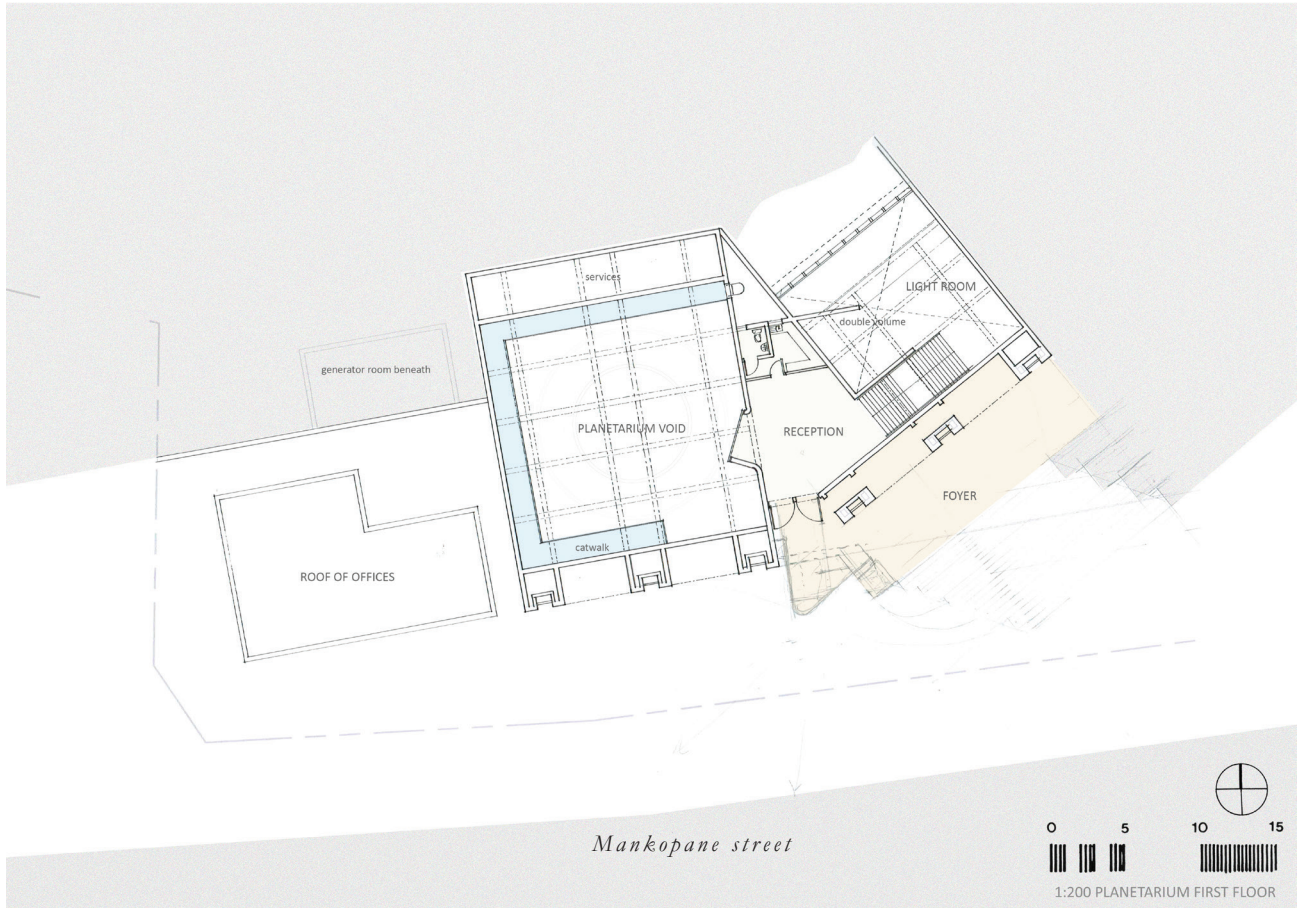
*The room and the garden*



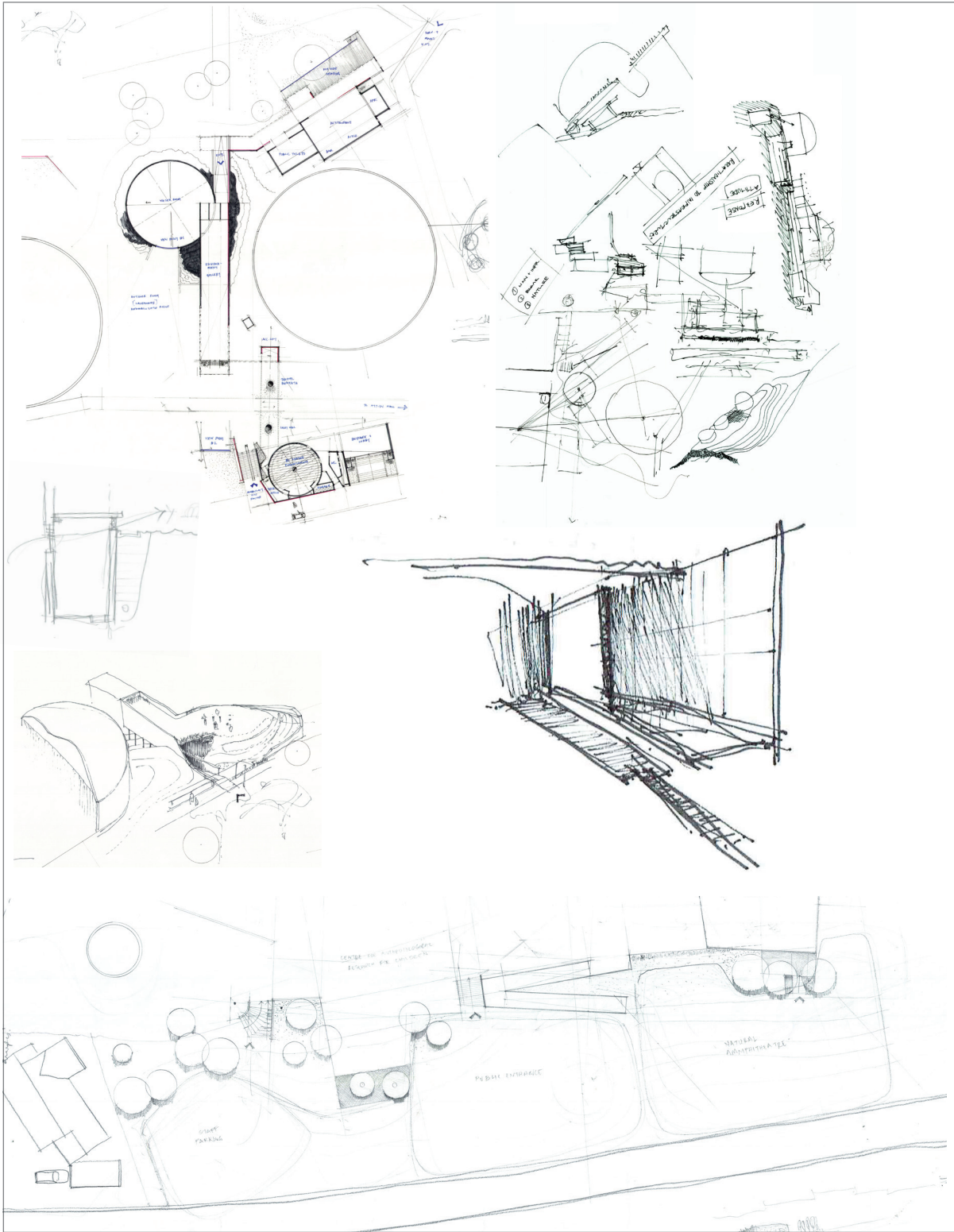
## 7.6.6 LOWER LEVELS

### *Planetarium and lobby plans*



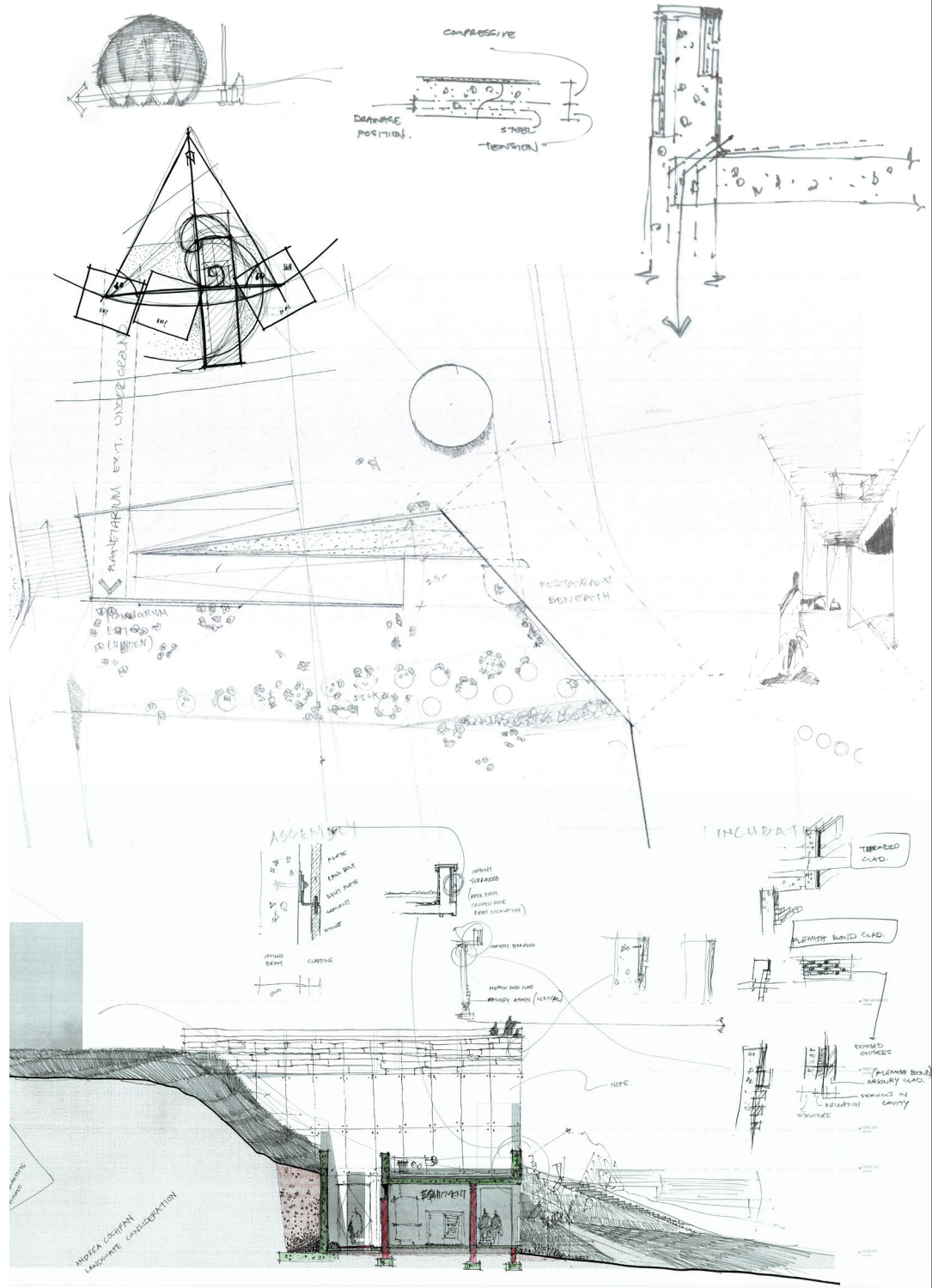


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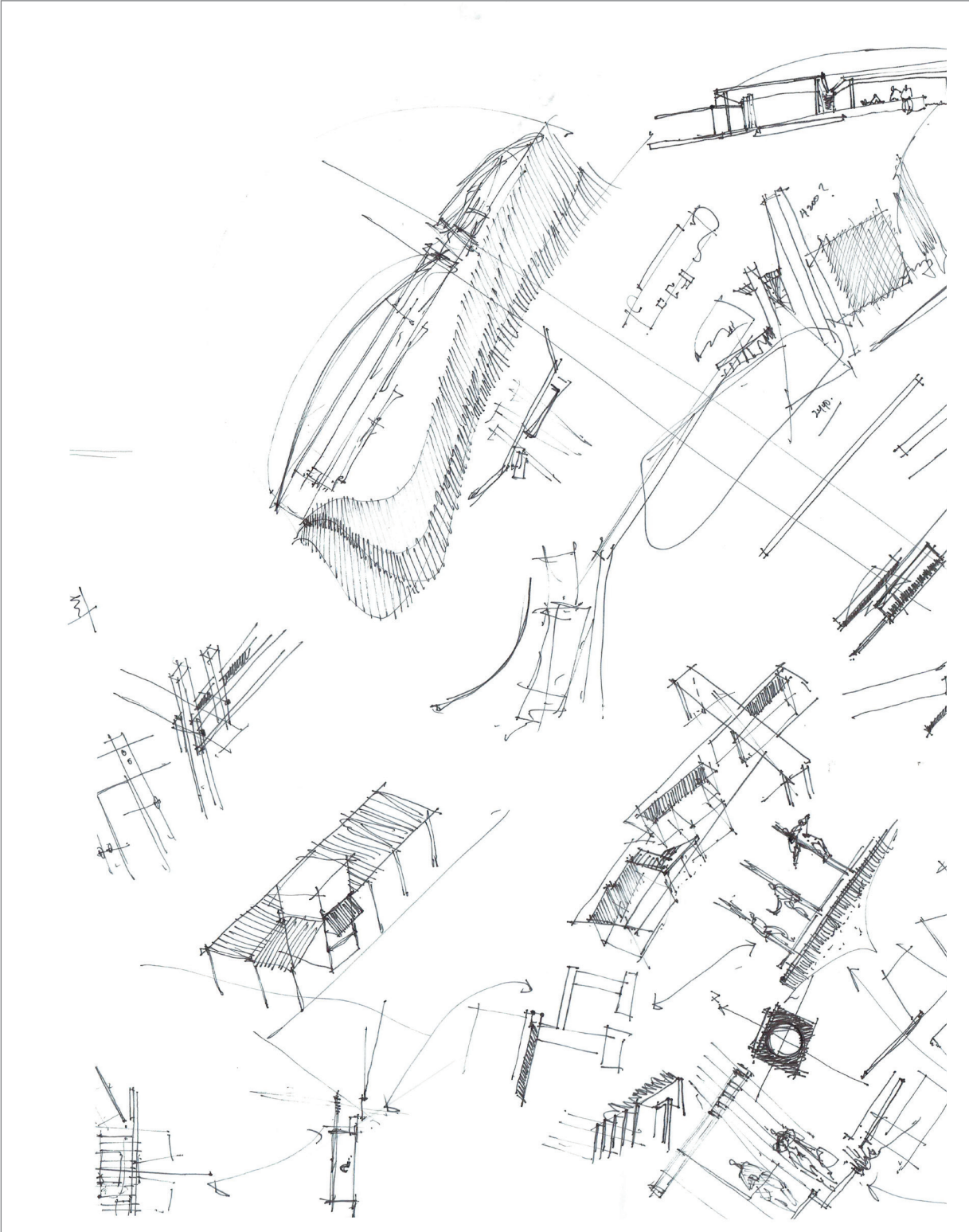


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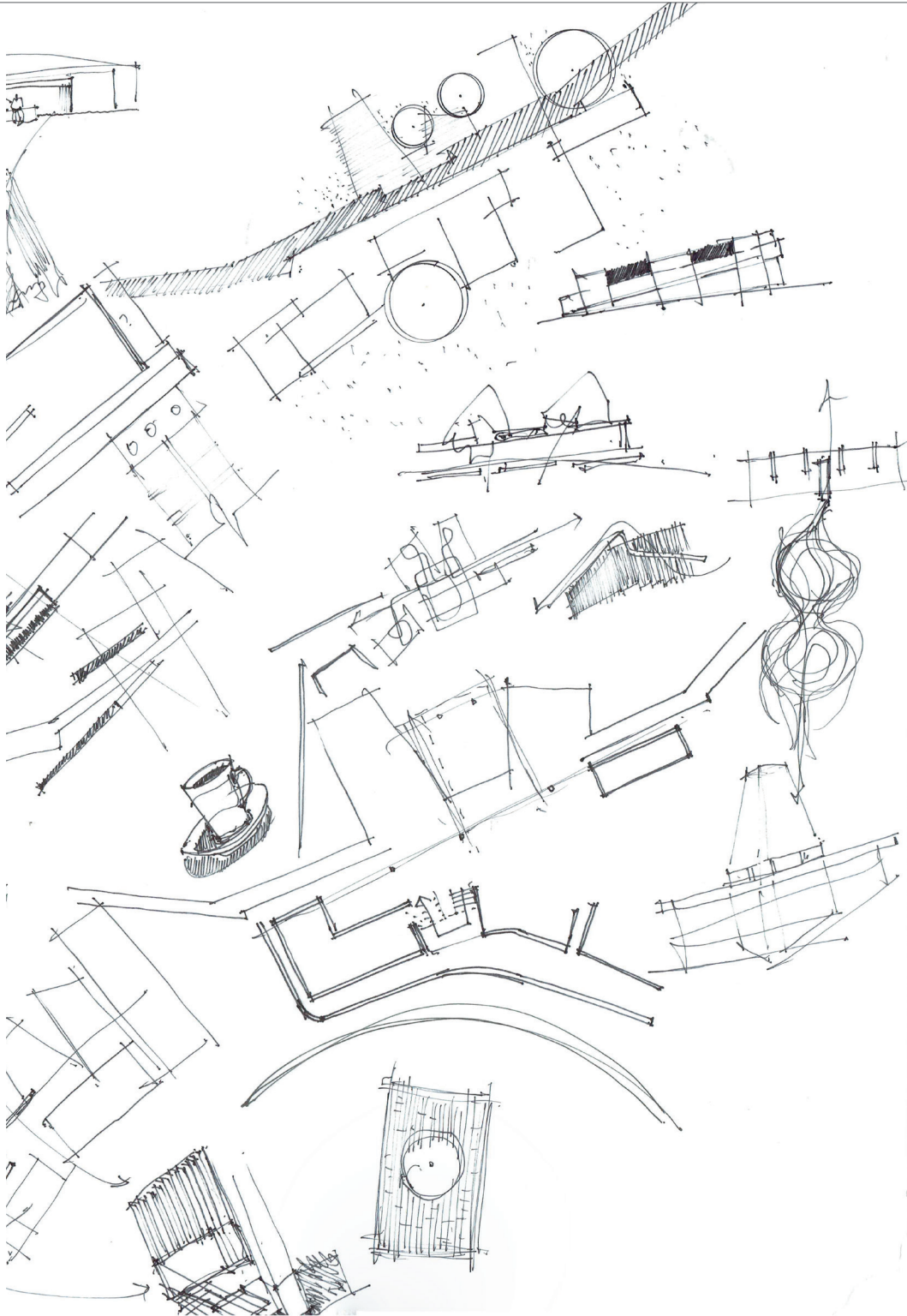


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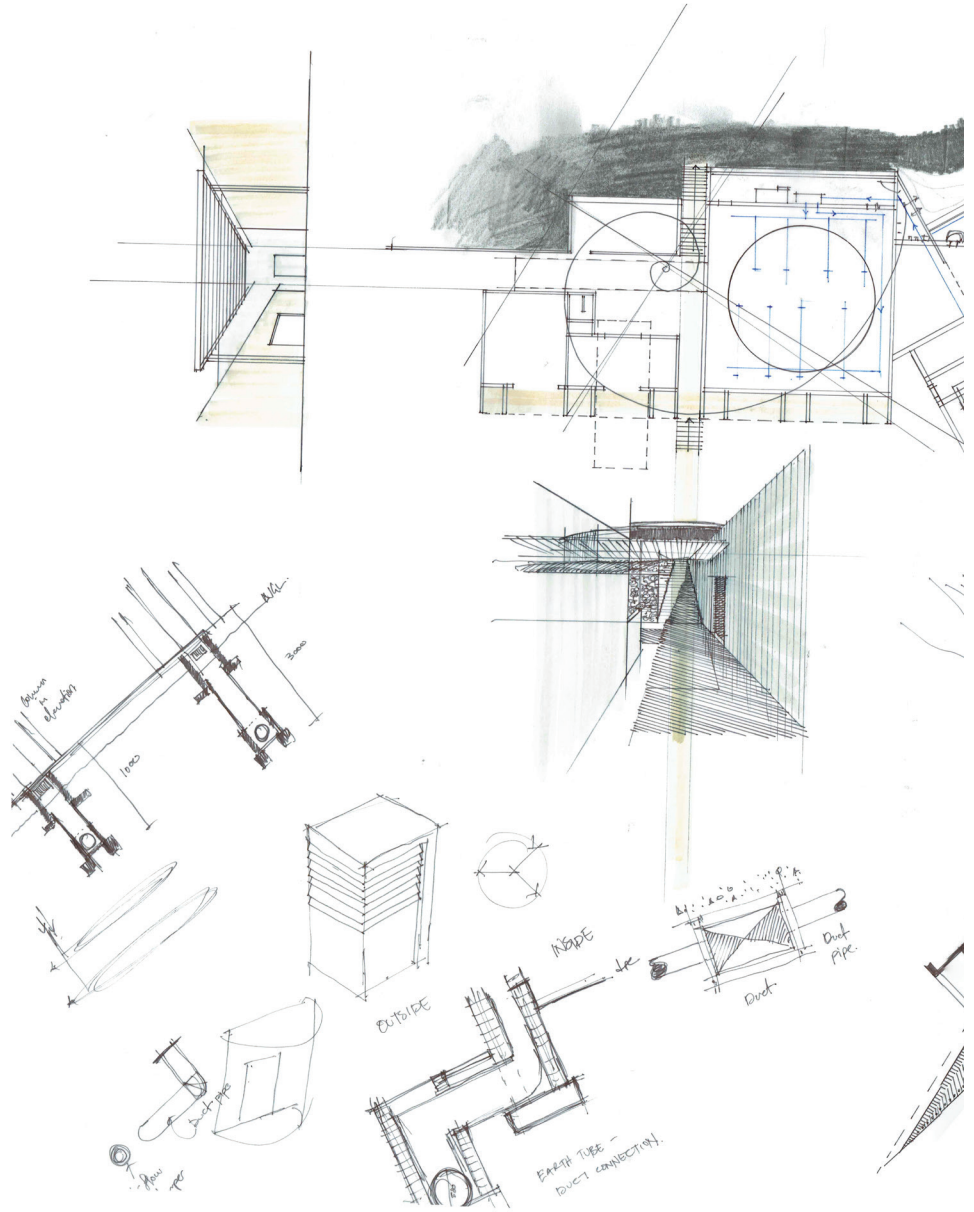




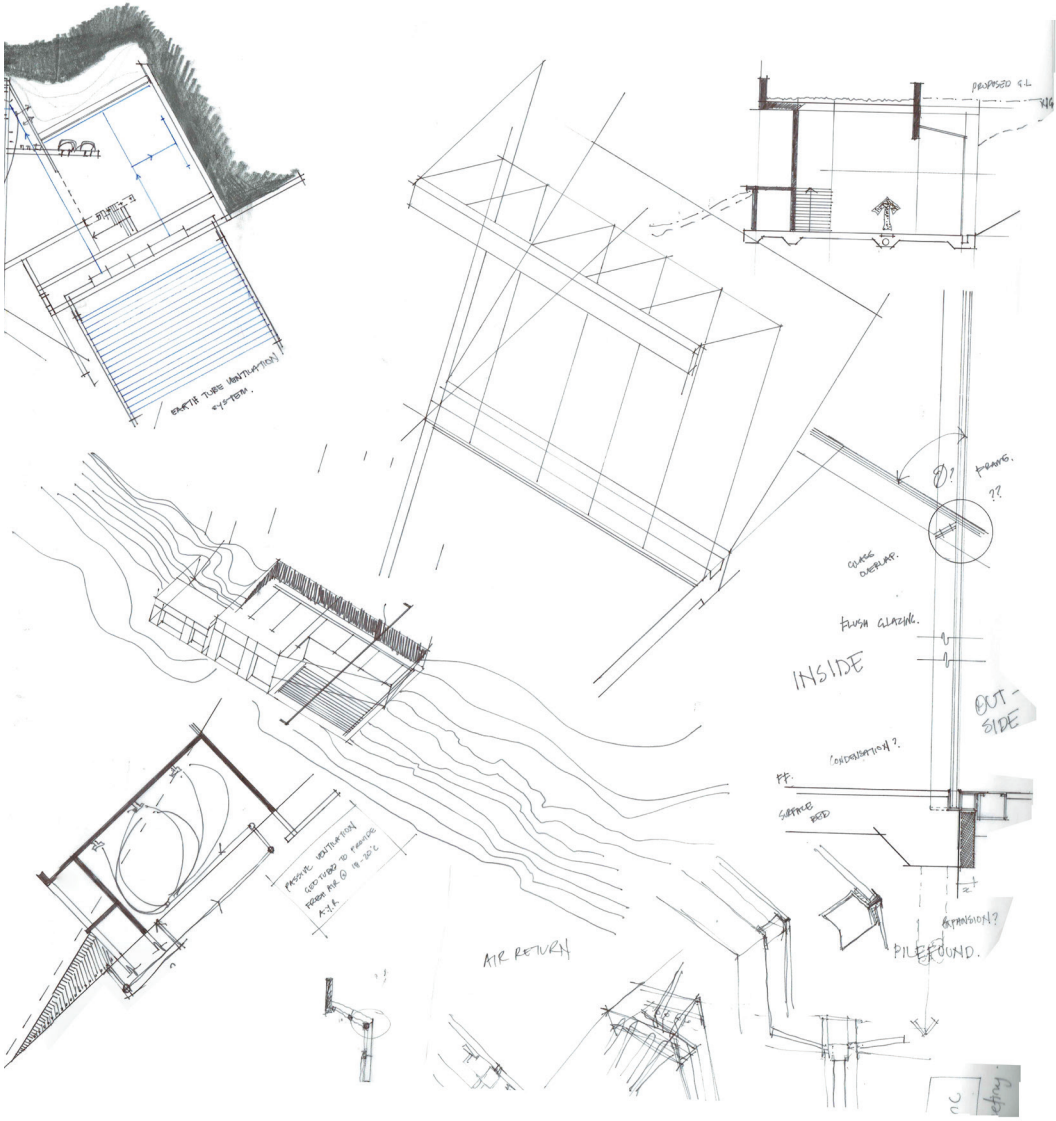
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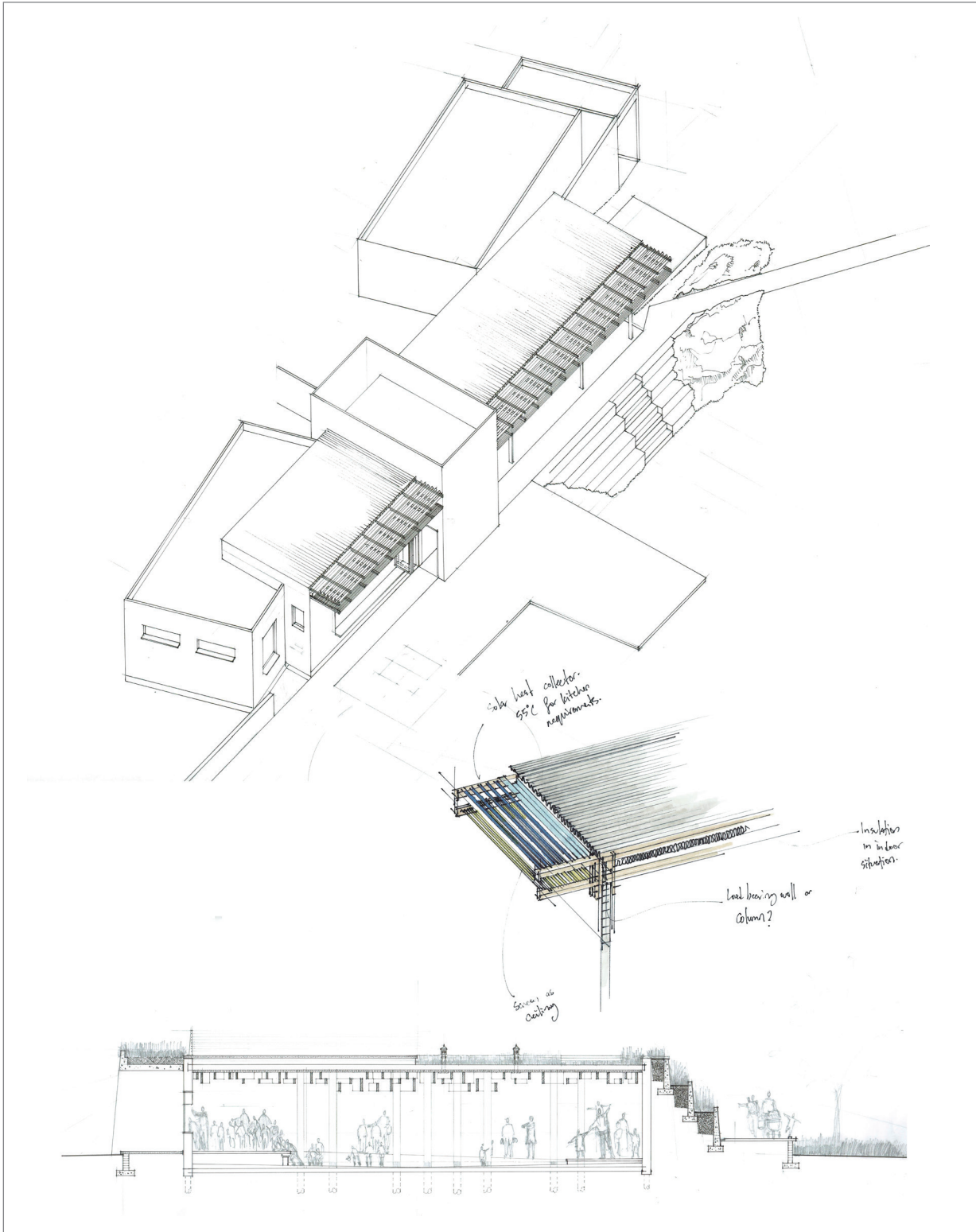
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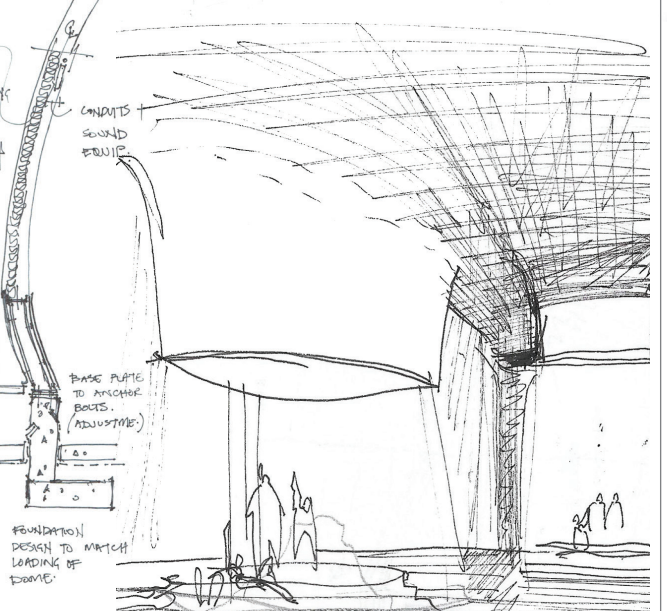
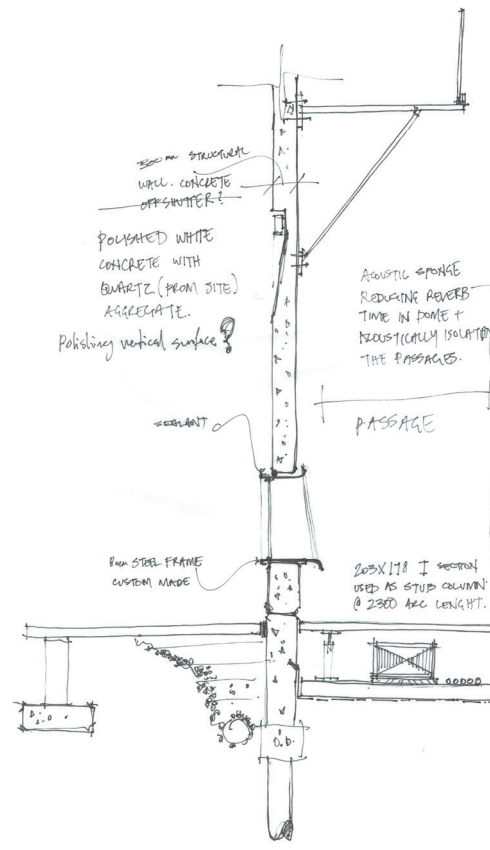
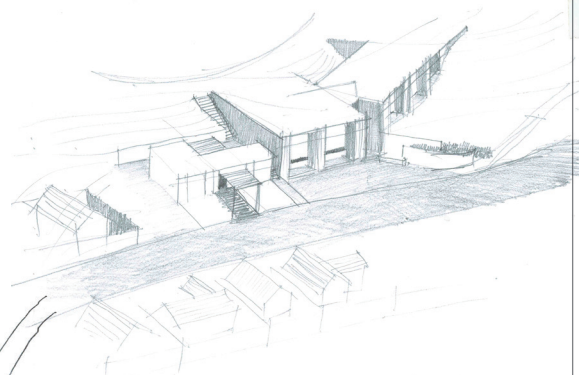
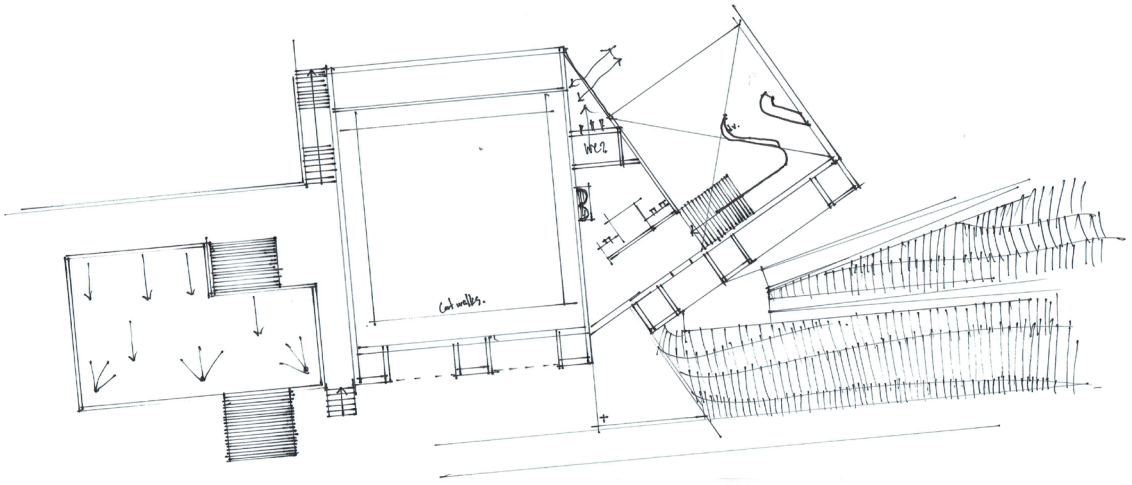
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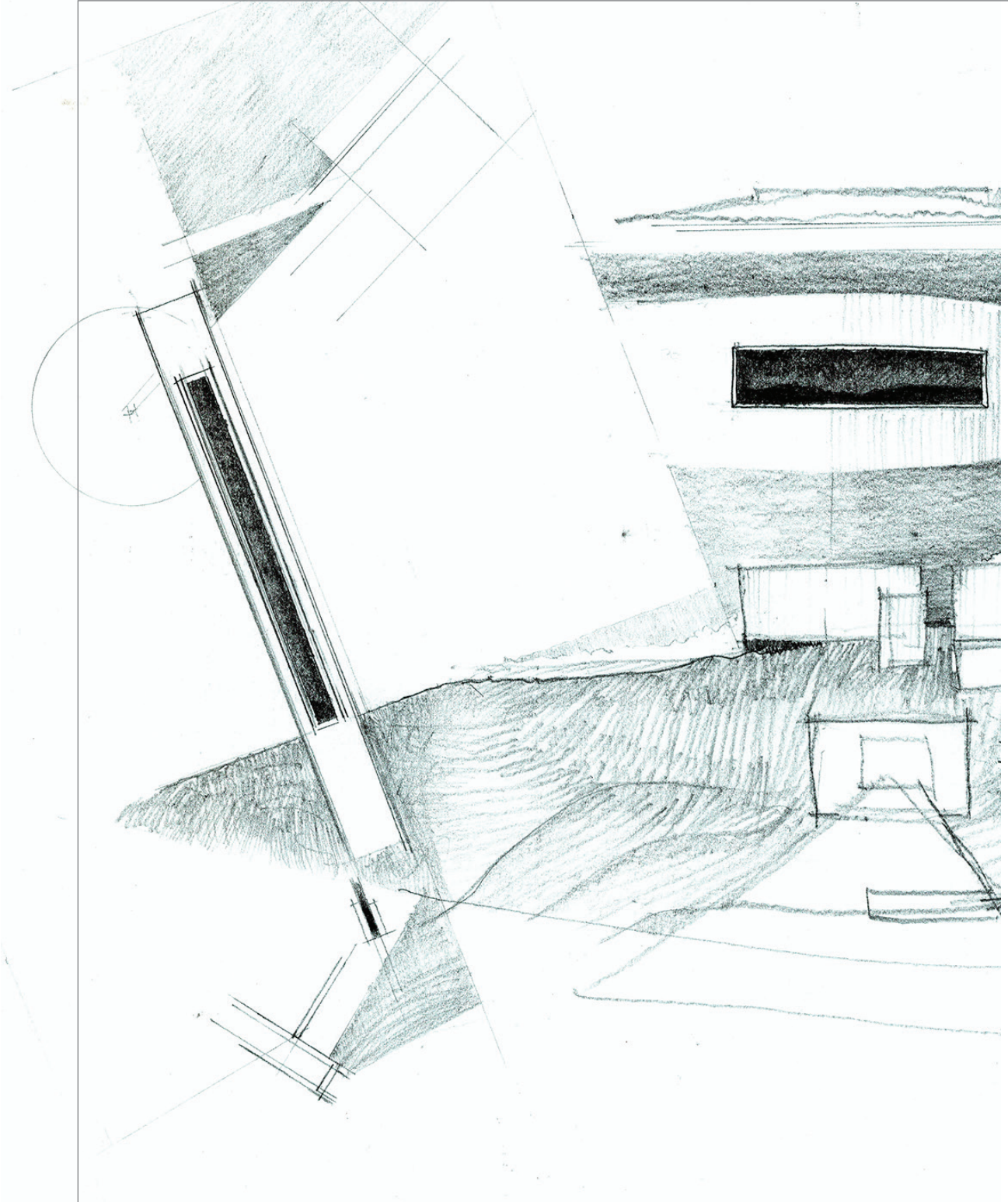


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INSIDE



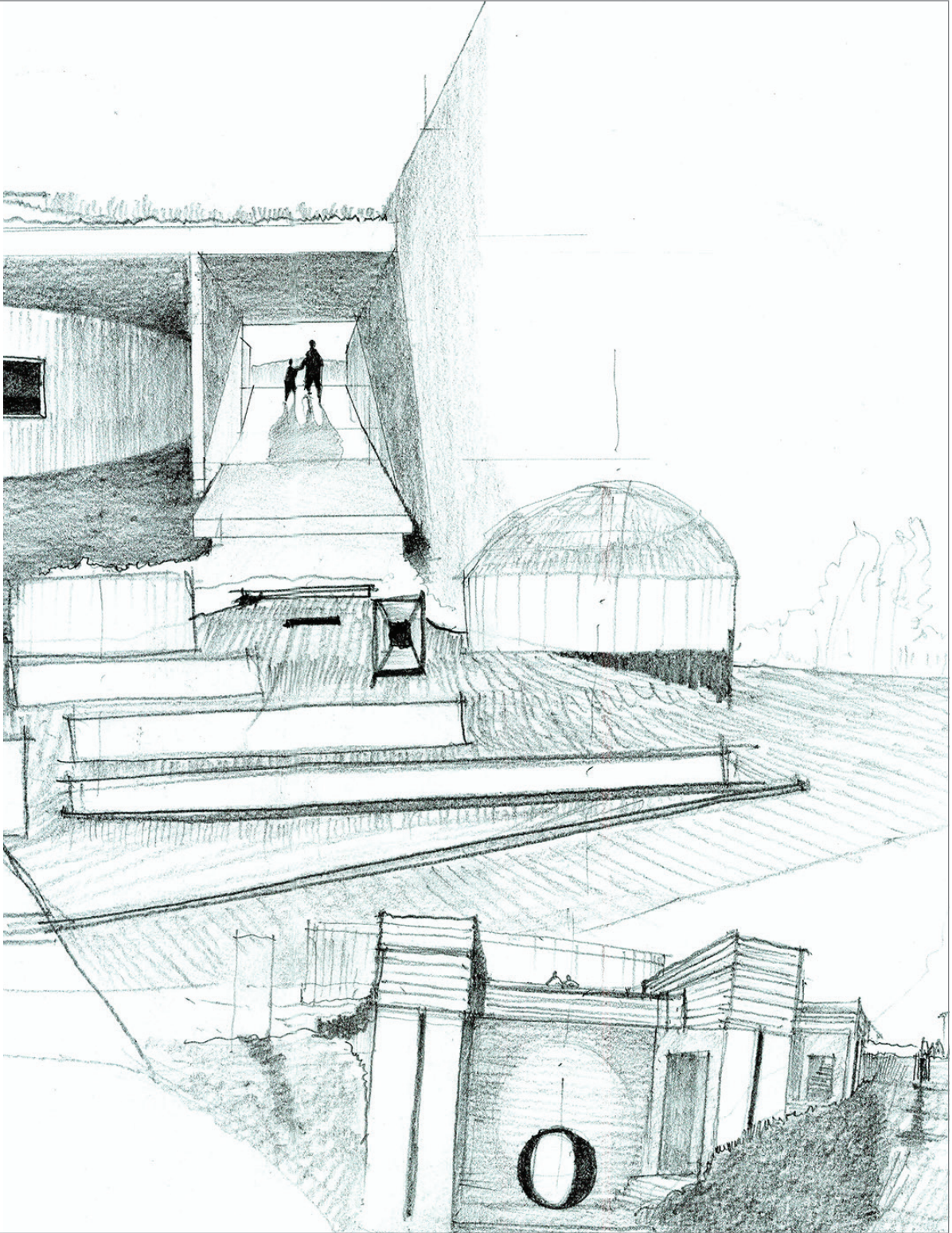
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