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# POETICS IN THE LANDSCAPE

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AN INTERPRETATION CENTRE FOR A WORLD HERITAGE SITE

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This dissertation is submitted in partial fulfillment of the requirements for the degree M.Arch. (Prof)

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**Declaration of original authorship**

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



Acknowledgment of editorial and proof-reading services:

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To my other half, who continuously supported and loved me no matter the challenges.

To Malherbe Rust Architects, who saw potential in me and have supported me since my second year,

To my supervisors, who continuously supported me during this challenging year and never stopped believing in me.

I would like to recognise the invaluable assistance that you all provided during my study.



**Figure 1: View from the stadsaal caves**

## Abstract

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Climate change is a global issue and the main challenge regarding this predicament is the human being's lack in ability to protect our natural environments.

This dissertation investigates how to overcome the conventional design process by critically analysing the context's geomorphology and vegetation to encourage a better understanding of the site.

An interpretation centre is proposed to inform the visitors of how the site is formed and how the vegetation functions, to create awareness of nature conservation. Awareness of nature conservation will attempt to equip the visitor with empathy towards the environment in order to protect it better. Once the environmental processes are better understood, the visitor can aid in the conservation process.

The geomorphology, fynbos and cedar tree will be investigated in depth; poetic ideas will be derived and together with architectural theories, a piece of architecture will be developed. A main walkway that leads from the parking to the Stadsaal caves will be constantly exposed to the landscape to encourage a nature-near approach throughout the proposed design. Ideas that are derived from the context will aim to result in a unique structural approach, which metaphorically demonstrates the presence of a cave whilst overlooking the landscape.

The proposed design process will make use of case and precedent studies as well as contextual analysis, where the unique Stadsaal caves that are carved to perfection by natural erosion are observed.

Awareness of the natural processes on site will attempt to create a being of care among the visitors. The function of the interpretation centre will aim to form a symbiotic relationship between the landscape and itself.



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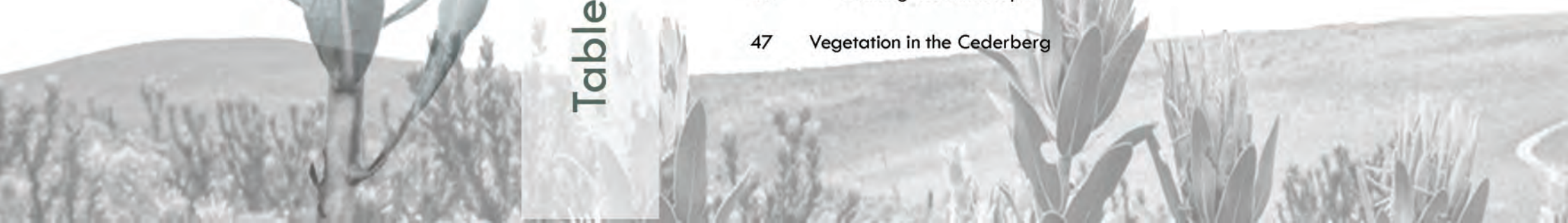
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## Project summary

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**Program:** Interpretation centre, restaurant, accommodation

**Location:** Stadsaal Cave, Cederberge, Western Cape, South Africa

**Site Coordinates:** 32°30'52.3"S 19°18'47"3E

**Client:** Cape Nature

**Users:** Nature lovers that finds nature important and tend to care for it in order to enjoy it.

**Theme:** Nature conservation

Nature conservation refers to the care and protection of natural resources in order for it to survive for future generations (National Geographic, 2020: online). "It includes the maintaining of species, genes and ecosystems, as well as functions of the environment, ... (National Geographic, 2020: online)."

**Architectural theoretical premise:** Analysing the geomorphology, fynbos and cedar tree of the site as well as discussing Richard Serra's land art, Richard Neutra's biorealism theory and Peter Zumthor's presence in architecture theory, from which poetic ideas are derived and interpreted into architecture.

**Architectural approach:** Nature is metaphorically appointed as a client. Focus is placed on the scale, physical properties, and the experience of the design in the landscape. Throughout the design, a nature-near experience is proposed. The design development is derived from the layers of geomorphology to create a presence of the site in the proposed design. The fire element between fynbos and the cedar tree is illustrated by means of the construction, giving the user a unique experience when passing through the proposed design.

**Aims:** This dissertation will aim to encourage the understanding of this particular site's environmental system in order to encourage conservation thereof.



Figure 1.1: Fynbos sketch  
(diydesign, 2020: online)

### Part 1:

Part 1 demarcates the project rationale and background by orientating the reader with regards to the contextual approach. The section familiarises the reader with the site, as it is such a challenge to communicate such a remarkable location on paper. Furthermore, the theoretical approach and site investigation, and how it informed the design process, is discussed in depth.

### Part 2:

In this section, precedent studies and the design exploration will be analysed in order to discuss the influences towards the design. Crucial decisions that were made during the design process will also be analysed.

### Part 3:

This section will demonstrate the design synthesis of research, the resolution of project aims and the technical resolution.

### Part 4

Part 4 will discuss the conclusion, reflection and references.

## Orientation

### Location

This dissertation is proposed in the Cederberg, which is located in the Western Cape, South Africa. Refer to Figure 2. The Matjiesrivier Nature Reserve, Hexberg State Forest and the Cederberg Wilderness are all protected areas that make up the Cederberg.

In the year 2000, the Matjiesrivier Nature Reserve was declared a nature reserve and in 2014, the area was declared a World Heritage Site (Cape Nature, 2020: online). The area is located in the overlapping zone of the Fynbos and lowland succulent Karoo biome. Thus, if one would visit the area, you would be exposed to both Fynbos as well as lowland succulent Karoo vegetation.

Examples of geological and archaeological heritage, such as the Stadsaal Cave, San rock art and the Truitjieskraal interpretive trail can be found in the area (Cape Nature, 2020: online).



Figure 2: Location of the Cederberg

(Google maps, 2017: online)



**Proposed site: The Stadsaal Cave**

Just off the beaten track, within the Matjiesrivier Nature reserve is a magical place called the Stadsaal Caves. After a long bumpy drive, one look at the natural wonder will make the drive all worth it.

The Stadsaal caves are not just another site in South Africa. This rock formation is carved to perfection by means of natural erosion. Refer to Figure 3 and 4. Astonishing weathered pillars as thin as icicles hold masses that could never be imagined. Peaks are placed into isolation and formations are left to the imagination. Refer to page 21 - 27 for a visual presentation of the site.

The Cederberg is considered a fragment of the ancient surface that is left behind. This surface is located above the African land surface and suggests that erosion has taken place over millions of years (Whitfield, 2015: 66). Refer to Figure 6.



(Author, 2020)

Figure 3: Sketch of rock formation at the Stadsaal cave.



(Author, 2020)

Figure 4: Sketch of rock formation at the Stadsaal cave.

## Theoretical underpinning

*How can the geomorphology and vegetation of the Cederberg inform the presence of the site and be developed into architecture?*

Theme: **Nature conservation**

This dissertation will conduct an in-depth analysis of the site, especially the geology, fynbos vegetation and the cedar tree. Following with the theoretical grounding of Richard Neutra's biorealism philosophy as well as Peter Zumthor's presence in architecture theory. Land art of Richard Serra will also be discussed and analysed. Finally, case studies and precedent studies will be analysed and explained.

All of the above will inspire poetic ideas that will inform the spatial and theoretical aspects of the design process. Refer to Figure 5.

Ultimately, nature will be appointed as a 'client' to inform the design process.

Theoretical approach to design:

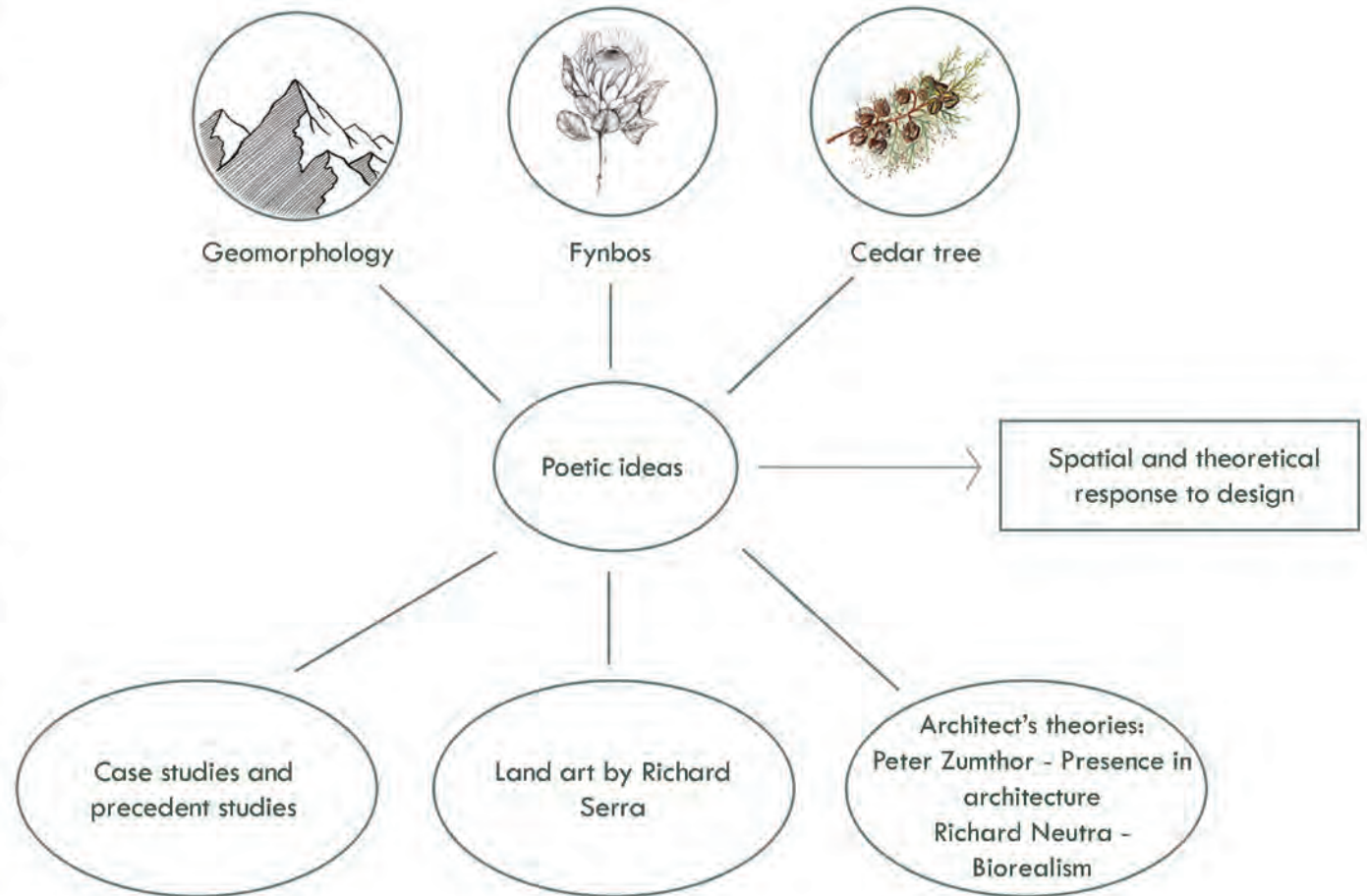
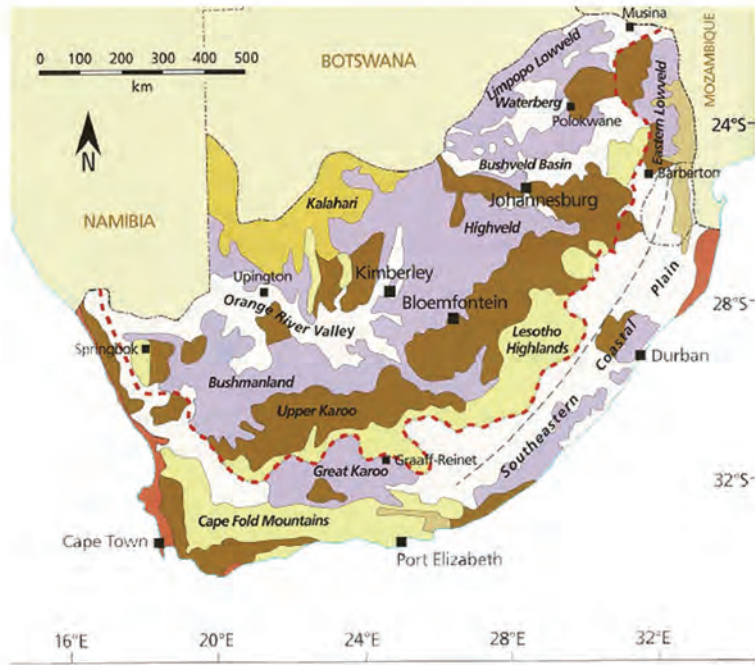


Figure 5: Theoretical underpinning  
(Author, 2020)



- |                                                                                                                                                       |                                                                                                                                                 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| <span style="display:inline-block; width:15px; height:15px; background-color:lightyellow; border:1px solid black;"></span> Older than African Surface | <span style="display:inline-block; width:15px; height:15px; background-color:orange; border:1px solid black;"></span> Coastal Neogene sediments |
| <span style="display:inline-block; width:15px; height:15px; background-color:lightpurple; border:1px solid black;"></span> African Surface            | <span style="display:inline-block; width:15px; height:15px; border-bottom:1px dashed black;"></span> Axis of maximum uplift                     |
| <span style="display:inline-block; width:15px; height:15px; background-color:lightblue; border:1px solid black;"></span> Post-African I Surface       | <span style="display:inline-block; width:15px; height:15px; border-bottom:1px dashed red;"></span> Line of the Great Escarpment                 |
| <span style="display:inline-block; width:15px; height:15px; background-color:lightgreen; border:1px solid black;"></span> Post-African II Surface     | <span style="display:inline-block; width:15px; height:15px; background-color:black; border:1px solid black;"></span> Cities and towns           |
| <span style="display:inline-block; width:15px; height:15px; background-color:lightgrey; border:1px solid black;"></span> Dissected areas              | <span style="display:inline-block; width:15px; height:15px; background-color:lightyellow;"></span> Great Karoo                                  |
| <span style="display:inline-block; width:15px; height:15px; background-color:yellow;"></span> Kalahari sediments                                      | <span style="display:inline-block; width:15px; height:15px; background-color:lightgreen;"></span> Geomorphic regions                            |

(Whitfield, 2015: 38)

Figure 6: Land surfaces

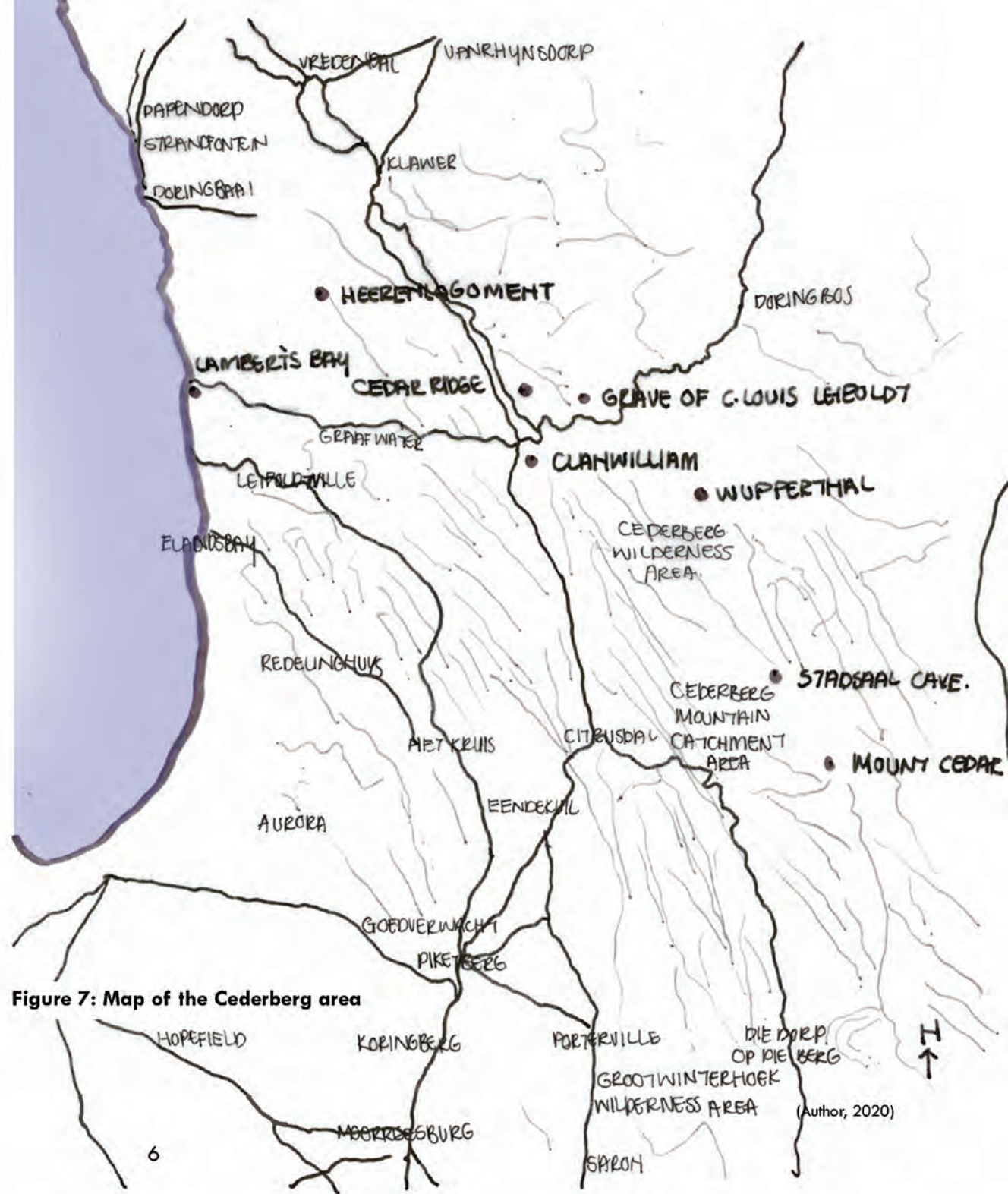


Figure 7: Map of the Cederberg area

(Author, 2020)

### A brief history of the Cederberg (Refer to Figure 7)

The Cederberg has been occupied by human activities for a long time. Refer to Figure 9. Evidence of hunting and trading are evident in rock art that is found in the Cederberg.

This area is a very significant geoheritage region as it contains caves and stone overhangs. Inside these caves, one can find numerous examples of San rock art. The Elephant cave showcases some of the most well-known rock art in the Cederberg. Refer to Figure 8. I have also witnessed rock art close to Mount Cedar in the Cederberg. Refer to Figure 14, page 12.

Before the Europeans occupied this landscape, the San (Bushmen) and the Khoi (Hottentot) lived in the Cederberg (van Rooyen, 1999: 12). They only went over the mountains so that their livestock could graze during the Summer; during Winter they would graze on the beaches west of the Cederberg.

The very first written report that was made of the Cederberg mountains was on the 6th of January, in 1488. Bartholomeus Dias was able to see the mountains while sailing past the west of South Africa. He called the mountains the "Sierra dos Reis" which translates to the mountains of the three wise men of the East (Van Rooyen, 1999: 12), which are presumably the three peaks of Sneeuberg. Refer Figure 88, page 36.

The Cederberg is about 200km away from Cape Town. Thus, when Jan van Riebeeck arrived in Cape Town for the first time in 1652, they took a mere 150 years to explore the country and reach the Cederberg. Even the explorers that searched for the legendary Kingdom of Monomotapa never seemed to travel through this region.



Figure 8: Rock art at the stadsaal cave

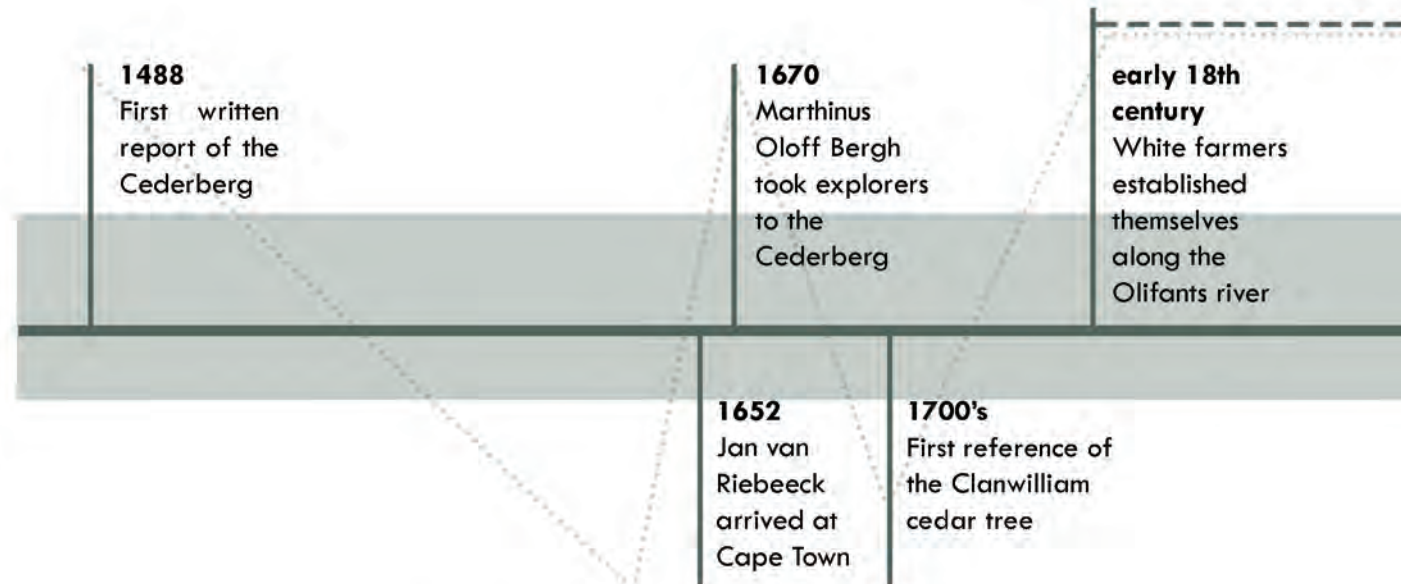


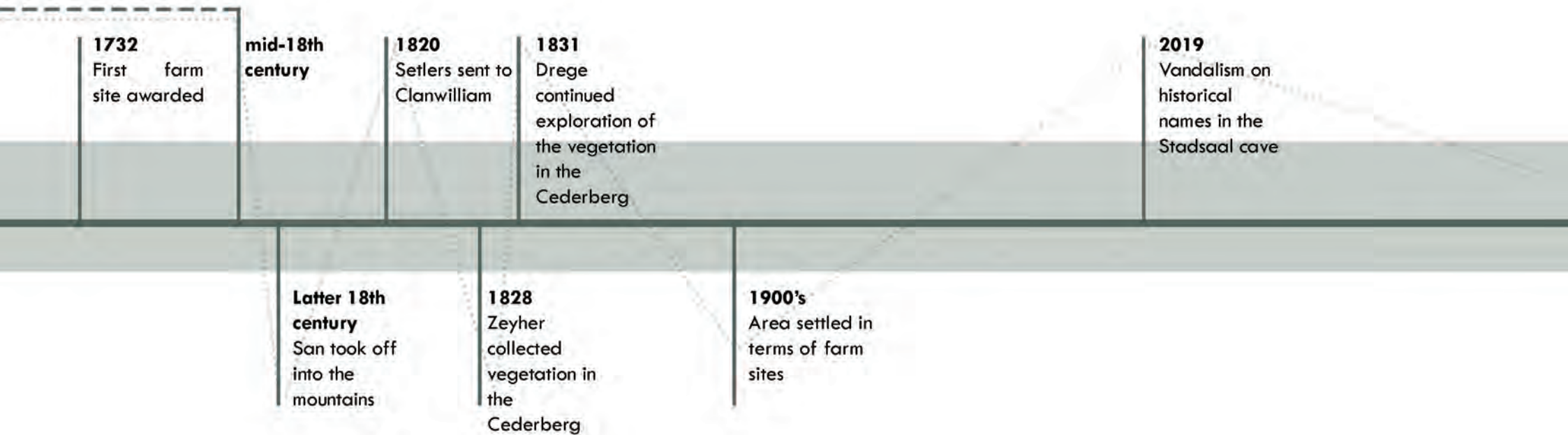
Figure 9: Timeline  
(Author, 2020)

However, one of the early colonialists, Marthinus Oloff Bergh, took explorers to the North of Cape Town in 1670 to explore the Cederberg (Cederberg Ridge, 2020: online). Refer to Figure 10. They came across the Elephants River and settled next to it. Today, the 10th generation of Marthinus Bergh is still on this farm, Cedar Ridge. The river was named the Elephants River because of the large numbers of elephants that were found in the region. Sadly, they were hunted until they became extinct to this area.

Explorers who did cross the mountains wrote that the landscape was full of "...grass, good firewood, large forests and impenetrable scrub" (Van Rooyen, 1999: 12). The first ever reference to be made of the endemic Clanwilliam Cedar tree was in the 1700's, which Governor William Adriaan Van der Stel reported.

In 1732, the first farm site was awarded but the area was only settled during the early 1900's (Cederberg Ridge, 2020: online).

Clanwilliam is the 7th oldest town in South Africa and was given the name Clanwilliam by Sir John Cradock, named after his father in law, the Scottish Earl of Clanwilliam (Cederberg Ridge, 2020: online). Clanwilliam's population started to grow in 1820 and a small group of settlers (126 men, 73 women and 159 children) were sent from England and Ireland to Clanwilliam (Cederberg Ridge, 2020: online). However, it was not too long before they moved to the Eastern Cape because of the harsh climatic conditions of this region, as the landscape was not suitable for farming.



White farmers (“trekboere”) established themselves along the Olifants River in the early 18th century until about mid-century (Van Rooyen, 1999: 13). Conflict situations arose when the farmers intruded on the San’s hunting territory. Latter 18th century, the San were confronted by the Khoi, and then the European settlers, which is why they then decided to leave into the mountains.

Botanical collectors avoided the exploration of the Cederberg until 1828, when Zeyher started to collect vegetation. He came back with Drege in 1831 to continue his exploration.

At the Stadsaal Cave, one can find the name of the South African poet, C.Louis Leipoldt, engraved in the cave as well as the first National Prime minister, D.F. Malan. Refer to Figure 59 and 62, page 24. Other names are also evident on the rocks that date back to the early 1800’s.

C.Louis Leipoldts’ grandfather, Johann Gottlieb Leipoldt, is founder of the small town, Wupperthal, in the Cederberg. Refer to page 17. Leipoldt is buried just outside the Cederberg at the beginning of Pakhuis Pass, close to Clanwilliam. Refer to Figure 11. He referred to the Cederberg in his poems as he was also amazed by this unique landscape. Refer to page 10.

“The scientific (geologic, geomorphic, ecological, biological and archaeological) significance and scenic value of the Cederberg mark the region as a prime geotourism and geoheritage centre within South Africa” (Quick, 2015: 92).

An area with so much history is worthy of celebration and protection.



Figure 10: Marthinus Oloff Bergh’s name carved in a rock at the Heerenlogement cave



Figure 11: Grave of C. Louis Leipoldt in a cave at the beginning of Pakhuis Pass.

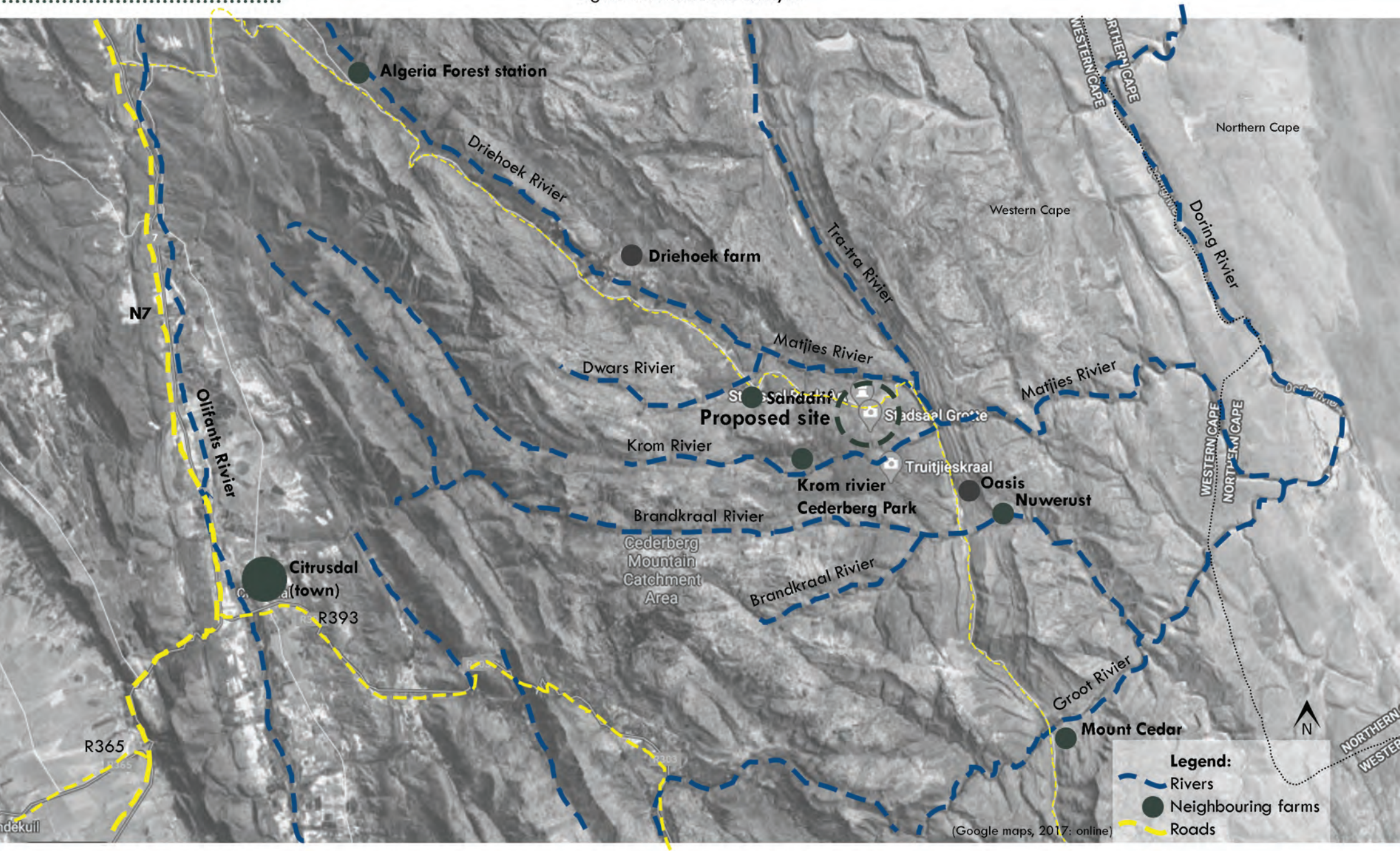


Figure 12: Skilpadbossies  
(Kijak, 2018: online)

“...Ver in die Troe-troe-vlakte, waar die skilpadbossies groei  
En heuningsoet die boesmangras laat in die voorjaar bloei;  
Waar, as die winter, halfpad wild, die wit-gerupte land  
Bedek het met 'n harde kors van half gevriesde sand,  
Die mistig môre, wasemryk, die son se glorie steel  
En skemeraande, ster-gestrooi, die hemel bo ferweel;  
Op uitspanplekke langs die pad wat deur Jan Dissels loop,  
Tot waar sy vuil-geel gruis-tapyt hom in diep water doop,  
As met die Olifantsrivier die blouberg-stroompie ming  
En waboombos en boegoebos tesam hul geure bring;  
Op Sederberg se plase, waar die winter-kone skok  
Die kweperlanings by die huis belaa met wit kapok;  
Waar teen die purperswarte rots die sederreuse pryk,  
Die oerou konings van die berg en van sy sederryk;  
Waar tussen ruie slingergras die afrikaner strooi  
Sy wierookgeure oor die land en spog in helder rooi,  
En bontgeverfde klossies met die grys kalkkoentjies paar  
In kleure-pronk en -skitter tussen donker groen geskaar;  
En in die dorpie op die vlak waarteen Karoberg lag,  
Waar glorie-groen met glorie-goud die skemeraande wag...”

C.L. Leipoldt  
(Kannemeyer, 1980:93)

Figure 13: Macro site analysis



The following section will introduce the Cederberg visually.

### Tourist attractions in the Cederberg

The Cederberg offers numerous tourist attractions. In a radius of about 20km from the proposed site, one can find the following activities to explore: (Refer to page 12 - 17.)

- Rock climbing:
  - Truitjieskraal
  - Rocklands Bouldering
  - Sanddrif Crag
  
- Hiking trails:
  - Maltese cross
  - Wolfberg Arch
  - Maalgat
  - Lot se vrou
  - Crystal pools
  - Truitjieskraal interpretive trail
  
- Restaurants:
  - Oasis biker restaurant
  - Bush bar at Nuwerust
  - Kromrivier restaurant
  
- The historical town, Wupperthal.
  
- Wine tasting

Tourists tend to spend a lot of time in the Cederberg which gave surrounding farms the opportunity to offer accommodation units and camping sites to generate an income. Examples of some of these farms are as follows:

- Sanddrif
- Driehoek
- Nuwerust
- Mount Cedar
- Kromrivier



Figure 14: Rock art at Mount Cedar



Figure 15: Rock climbing: Sandrif Crag



Figure 16: Rock climbing:  
Rocklands bouldering

(CapeNature, 2020: online)

Figure 17: Activities map

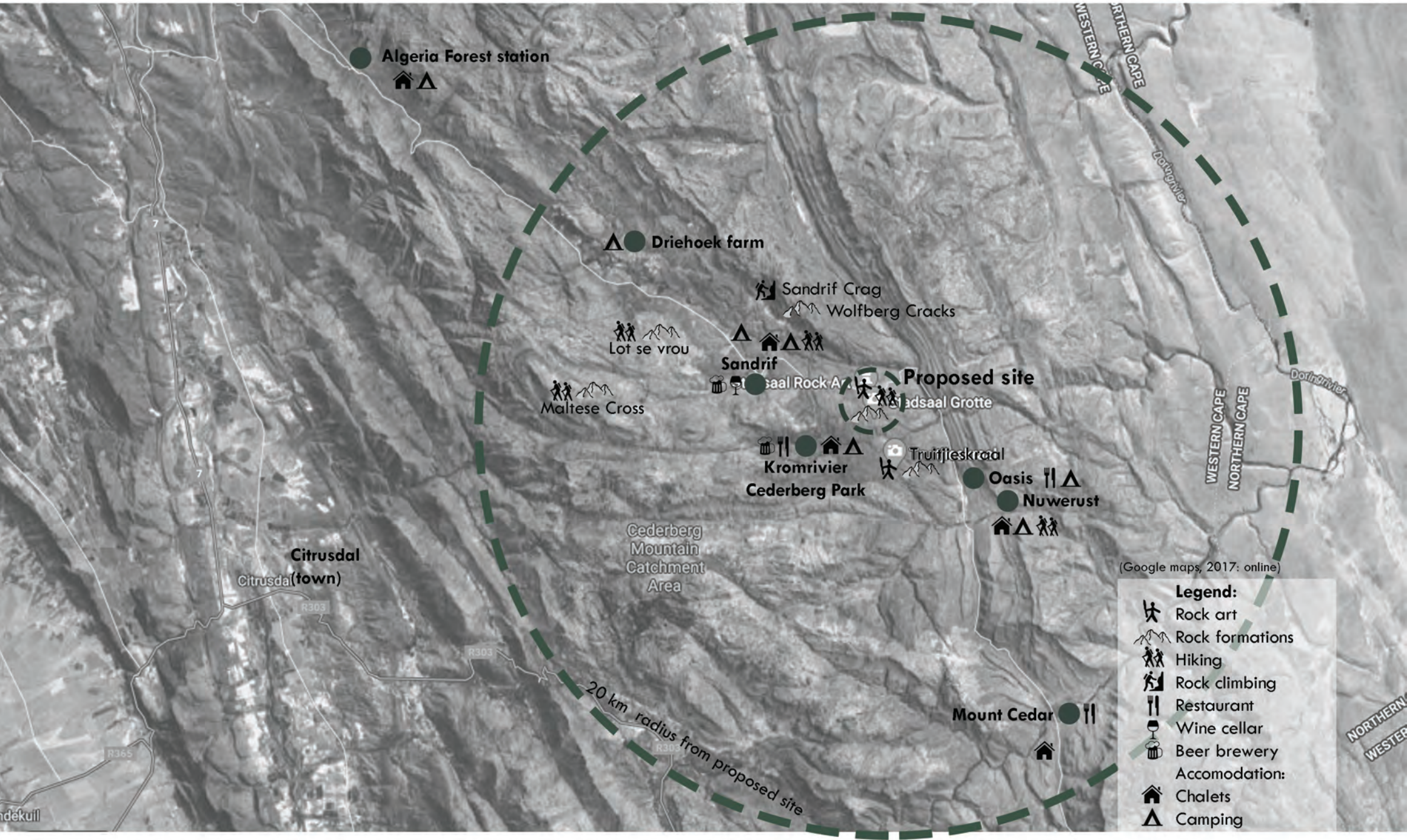




Figure 18: Hiking trail:  
Truitjieskraal interpretive trail

(Author, 2016)



(Cape Hike, 2020: online)

Figure 19: Hiking trail: Maalgat at Sanddrif



Figure 20: Hiking trail: Rock art at the  
Truitjieskraal interpretive trail

(Author, 2016)



Figure 21: Restaurant: Kromrivier (Author, 2019)



Figure 22: Restaurant: Kromrivier (Author, 2019)



Figure 23: Accommodation: Kromrivier (Author, 2019)



Figure 24: Restaurant: Kromrivier

(Author, 2019)



Figure 25: Hiking trail: Lot se vrou

(Author, 2016)



(Author, 2019)

Figure 26: Accommodation: Nuwerust



(Author, 2019)

Figure 27: Restaurant: Bush pub, Nuwerust

Figure 28: Restaurant: Bush pub, Nuwerust



(Author, 2019)

Figure 29: Accommodation: Oasis



(Cederberg conservancy, 2020: online)



(Author, 2019)

Figure 30: Accommodation: Sandrif

Figure 31: Wine tasting at Sandrif



(Author, 2019)



**Figure 32: Wupperthal after the fire** (Kruger, 2018: online)

Unfortunately the small town, Wupperthal, suffered a disastrous fire on the 30th of December in 2018. An estimate of 45 homes, the town hall and the school was burnt down (Timeslive, 2018: online). Refer to Figure 32.



(Sutterstock, 2018: online)

**Figure 34: A street in Wupperthal**



**Figure 33: Leipoldt house - Was once the home of the poet Louis Leipoldt** (Pretorius, 1994: online)



**Figure 35: no. 33 Tratra Street** (Pretorius, 1994: online)

## Proposed site

The Cedarberg has now been introduced, the proposed site will now be discussed.

The proposed site is in the Matjiesrivier Nature Reserve in the Cederberg, at the Stadsaal cave. Refer to Figure 36 - 38.



Figure 36: Aerial photo of proposed site

A 3D model of the site and a contour map, showing the orientation on the site. Refer to Figure 37.1 and 37.2.

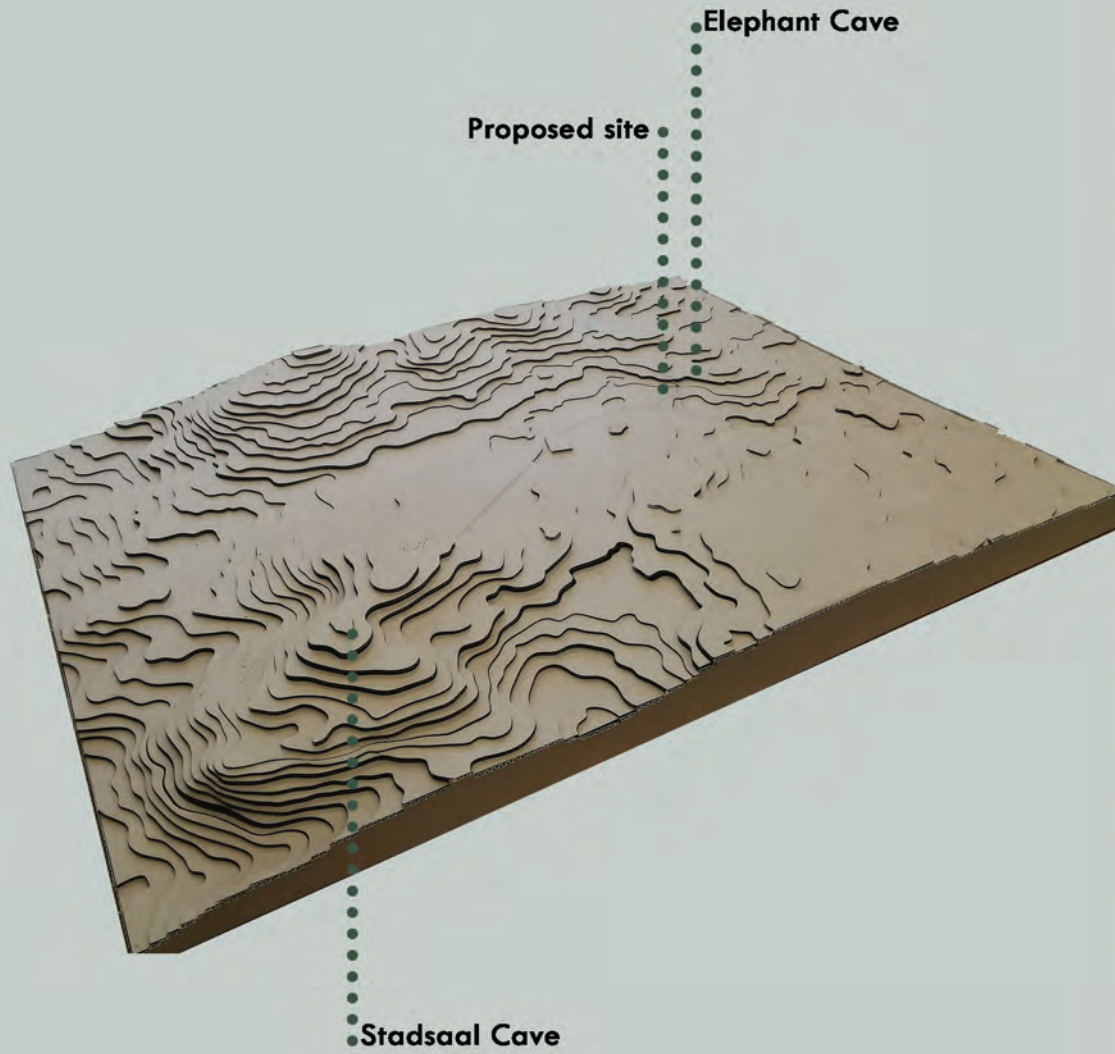


Figure 37.1: Site model  
(Author, 2020)

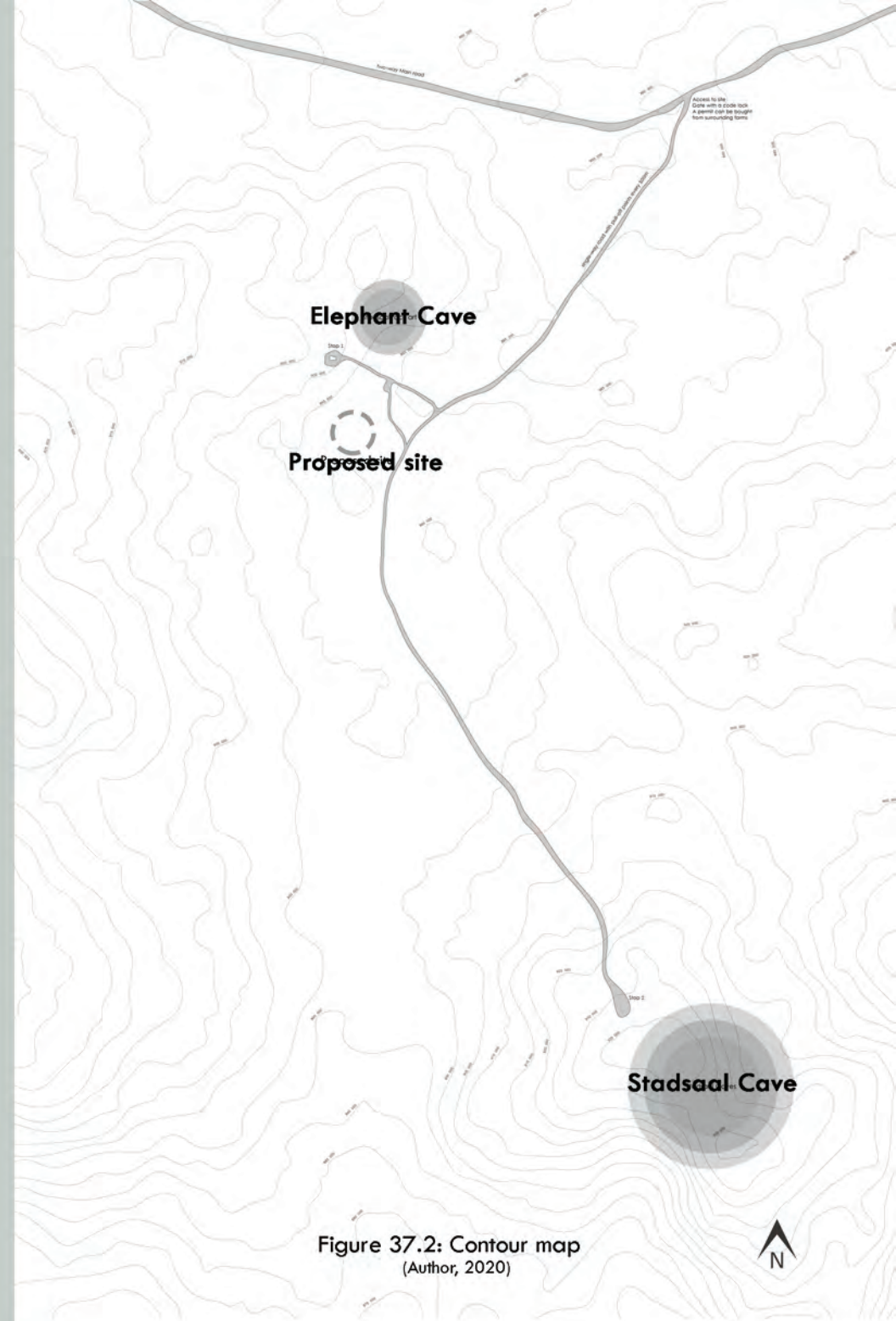


Figure 37.2: Contour map  
(Author, 2020)

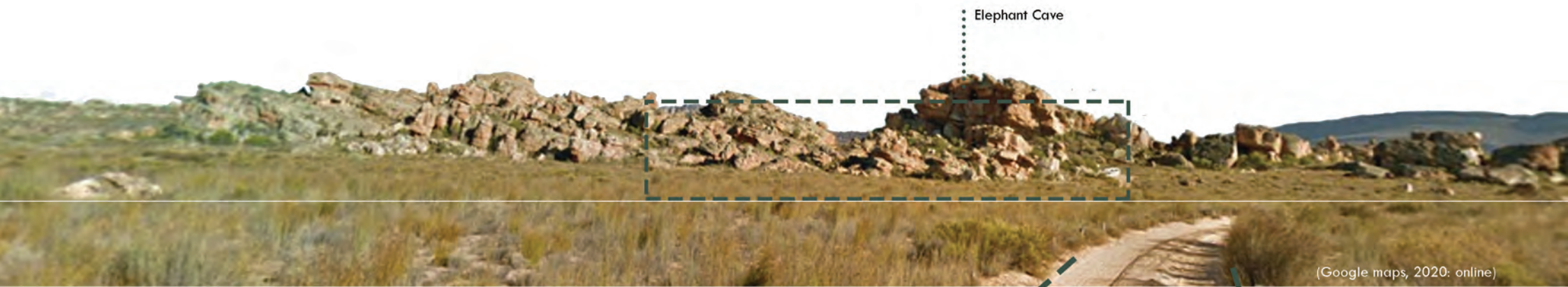


Figure 38: Proposed site

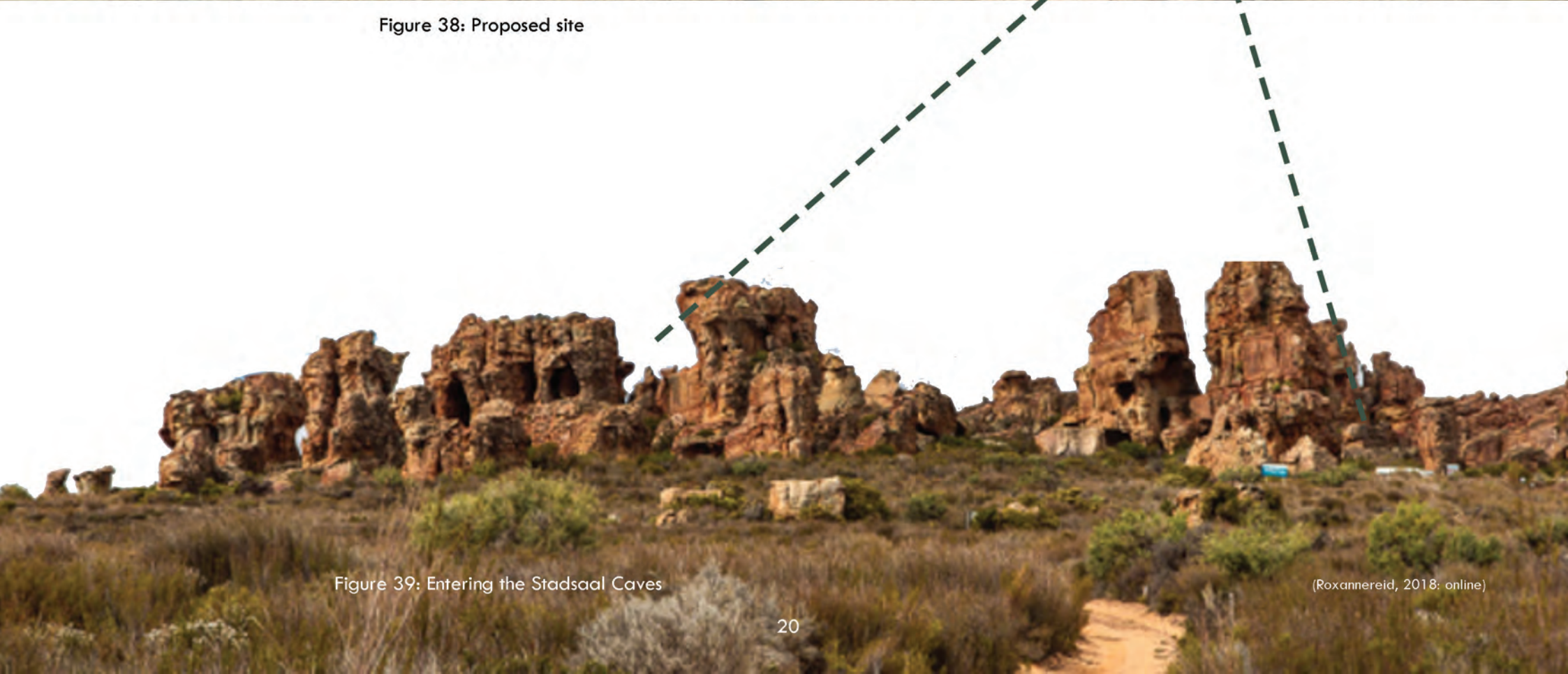


Figure 39: Entering the Stadsaal Caves

# Visual analysis - Elephant cave and Stadsaal cave

The Elephant Cave presents well preserved rock art. Refer to Figure 40 - 45.

Figure 40: The Elephant Cave



Figure 41: Rock paintings in the Elephant Cave



Figure 42: View from the Elephant Cave in North West direction - also proposed parking area area



Figure 43: The Elephant Cave

Figure 44: Rock paintings in the Elephant Cave

Figure 45: View from the Elephant Cave with the Stadsaal Cave in the far in a South West direction

The Stadsaal Cave presents a series of beautiful rocks formed over time. These geomorphological wonders frame the landscape naturally, an imaginative place to wander through and to discover. Refer to Figure 46 - 75.

Figure 46: Vehicular entrance to the Stadsaal Cave



Figure 47: The Stadsaal Caves



Figure 48: View from the Stadsaal Cave to the Elephant Cave

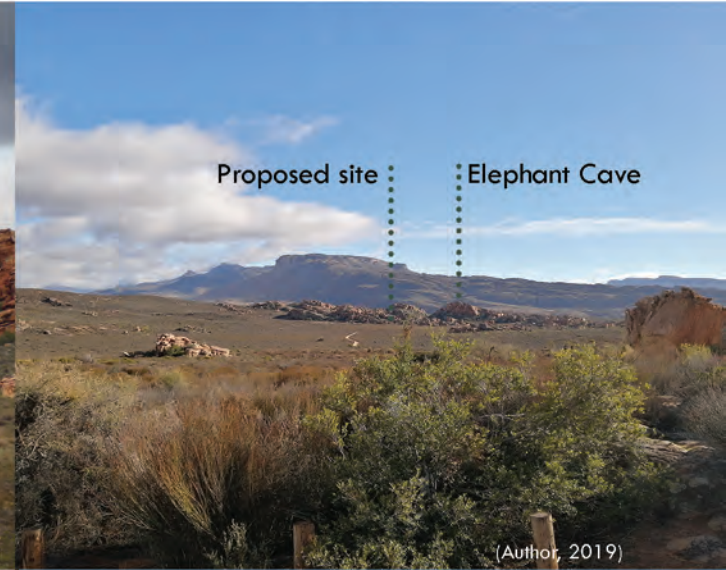


Figure 49: Entrance to the Stadsaal Cave



Figure 50: Parking space at the Stadsaal Cave



Figure 51: Footpath to the Stadsaal Cave

Figure 52: Formations at the Stadsaal Caves



Figure 53: Formations at the Stadsaal Caves



Figure 54: Formations at the Stadsaal Caves



Figure 55: Formations at the Stadsaal Caves

Figure 56: Formations at the Stadsaal Caves

Figure 57: Rock formations

Figure 58: The Stadsaal Cave



(Author, 2019)

Figure 59: Vandalism in the Stadsaal Cave



(Author, 2019)

Figure 60: Inside the Stadsaal Cave



(Author, 2019)



(Author, 2019)



(Author, 2019)



(Author, 2019)

Figure 61: A natural frame in the Stadsaal Cave

Figure 62: Names that were written many years ago, and then vandalised

Figure 63: In the Stadsaal Cave

Figure 64: Natural frames at the Stadsaal Cave



(Author, 2019)

Figure 65: Views from the Stadsaal Cave



(Author, 2019)

Figure 66: Views from the Stadsaal Cave



(Author, 2019)



(Author, 2019)



(Author, 2019)



(Author, 2019)



(Author, 2019)

(Author, 2019)

Figure 67: Rock formations

Figure 68: Rock formations

Figure 69: Rock formations

Figure 70: Rock formations in the landscape



(Author, 2019)

Figure 71: Rock formations



(Author, 2019)

Figure 72: Rock formations



(Author, 2019)



(Author, 2019)

(Author, 2019)

Figure 73: Rock formations



(Author, 2019)

Figure 74: Rock formations in the landscape



(Author, 2019)

Figure 75: Rock formations



(Author, 2020)

Figure 76: Rock formation at the Stadsaal cave

*"...En die pronk-Sederberge, in gelid,  
Wat reuse-sandsteenkrans boontoe strek,..."*

*C.L. Leipoldt*  
(Kannemeyer, 1980:234)

## Introduction

---

An article done by The New York Times Style Magazine states that, "Amid pandemics and environmental disasters, designers and architects have been forced to imagine a world in which the only way to move forward is to look back into history (Saval, 2020: online)."

Saval also states that architects are reconsidering their methods as modern design has failed. Therefore, it is suggested that the architectural process should consider other methods. Architecture has always been a futuristic topic, meaning that one would design for the unknown and we should rather look back at history for design ideas (Saval, 2020: online). Considering these unique circumstances regarding the pandemic in 2020, the future seems even darker. Therefore, it is suggested that one look back in history to consider other design methods that we already know of but just need to explore.

This dissertation will attempt to consider a different design process by analysing the context in detail, creating a very site-specific design.

The article also suggests that in this time, one should consider designing for different futures as it becomes more unknown every day (Saval, 2020: online). Therefore, the approach to investigate bio-camouflage is an opportunity to learn from nature and to apply the skills that have been learned.

A piece of artwork that was done called the "Resurrecting of the Sublime", produces the smell of flora that went extinct in the past 200 years. This piece suggests memory and awareness. It focusses on the essential paradox of contemporary design - The environment has been destroyed in the attempt to make our environment more comfortable for ourselves (Saval, 2020: online).

The proposed project will aim to listen and to observe nature, and to create and experience the landscape throughout the design. The proposed design will form a symbiotic relationship with its environment as it will attempt to create awareness among the environmental processes happening on site and in return, the landscape will create a presence of amazement among the visitors.

## Theoretical underpinning

The proposed site is now introduced, the theoretical underpinning will follow by analysing the geomorphology, fynbos and the cedar tree in depth as well as the architectural theories. Refer to Figure 77.

*How can the geomorphology and vegetation of the Cederberg inform the presence of the site and be developed into architecture?*

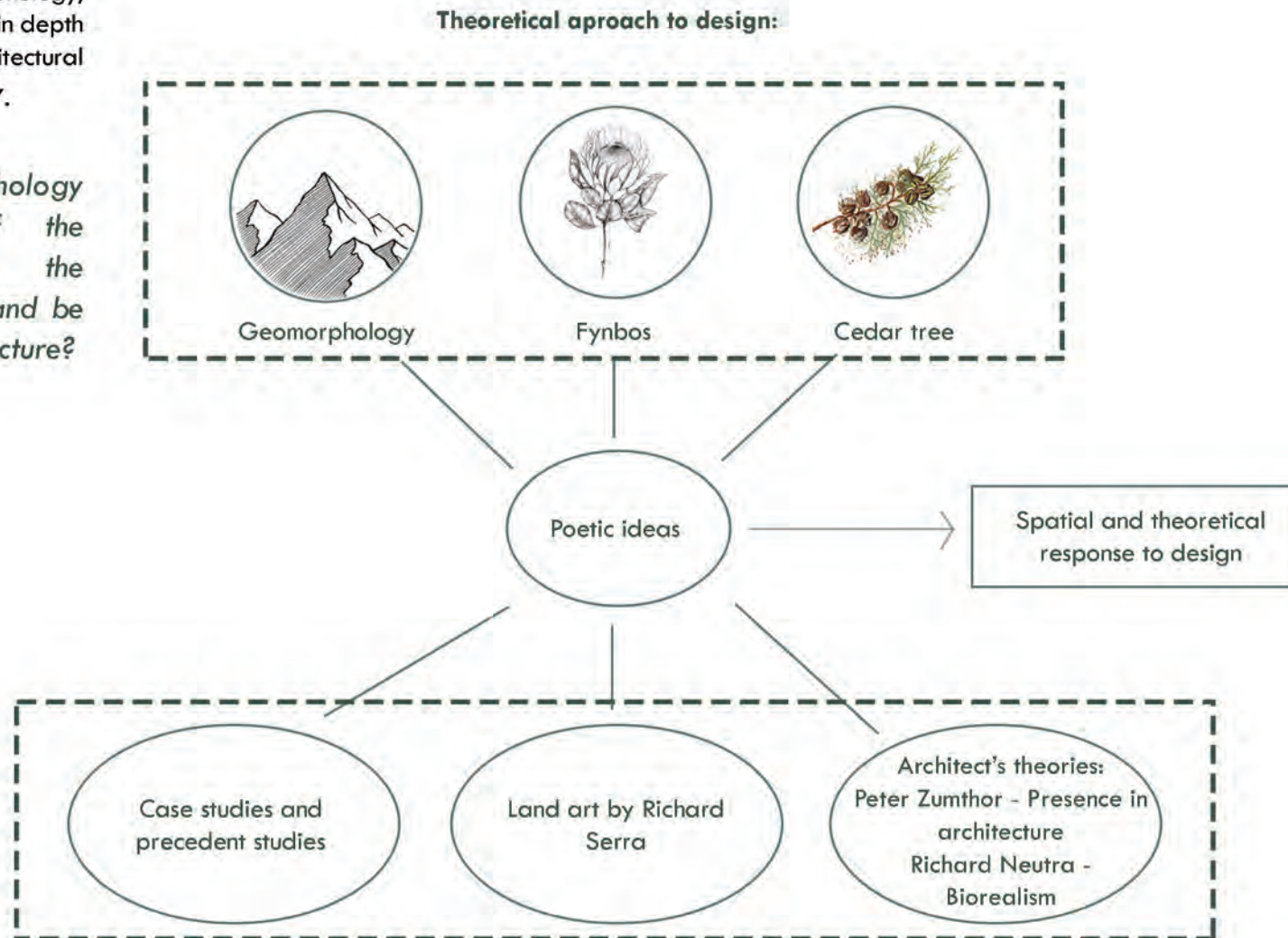


Figure 77: Theoretical underpinning  
(Author, 2020)

## Biomimicry vs Bio-camouflage

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There has been noted that this dissertation could have easily followed biomimicry as a theoretical approach, but a bio-camouflage route was rather followed.

“Biomimicry is a practice that learns from and mimics the strategies found in nature to solve human design challenges (Benyus, 2020: online)”. A decision was made to rather analyse this dissertation in terms of its physical scale and experience on site. The theory provides a lens in which the dweller becomes aware of its surroundings. Thus, a bio-camouflage approach was taken, rather than biomimicry. Bio-camouflage is: “... a defence mechanism or tactic that organisms use to disguise their appearance, usually to blend in with their surroundings (National geographic, 2011: online).” Refer to Figure 78.

Organisms mask their location, identity and movement by means of camouflage, which protects them from predators. Several factors are taken into consideration when camouflage is used, such as the physical characteristics of the organism, the behaviour, and the behaviour and characteristics of their predator (National Geographic, 2011: online). Camouflage tactics will be mentioned throughout the dissertation as a lot has been learned from nature.

The context was critically analysed to develop the best suitable piece of architecture for this site.

Whether biomimicry or bio-camouflage was used, either way, aspects are learned from nature and the aim is to create a space that connects to the natural world to encourage a healing experience.



Figure 78: Bio camouflage



Figure 79: Client: Cape Nature  
(CapeNature, 2020: online)



Figure 80: The Cedar tree

(Boots&fins, 2020: online)

## The Cederberg

Originally the Cederberg was named the 'Cedarberg'. The name referred to the endemic, and critically endangered, Clanwilliam Cedar tree. Eventually, the name Cederberg was approved as it is a combination between the English and the Afrikaans, 'Sederberge' (Quick, 2015: 85). Refer to Figure 80.

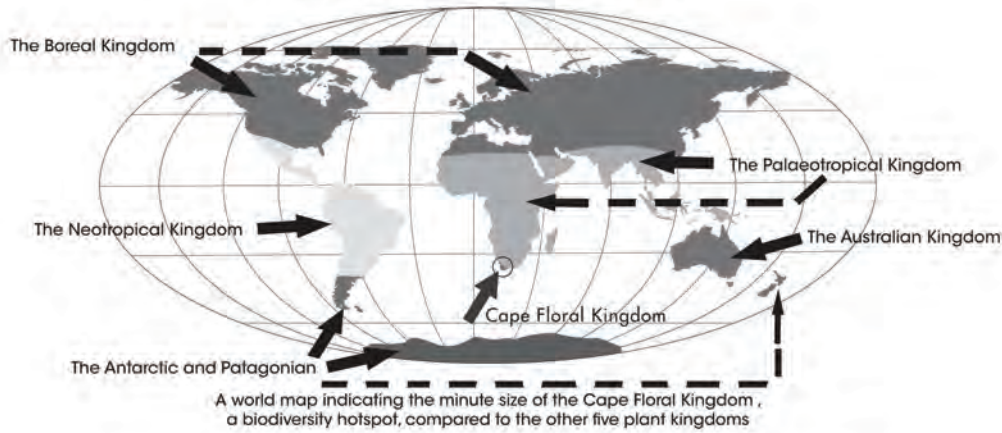
The geology and soil quality of the Cederberg is very important for the distribution of Mountain fynbos, which consists of numerous diverse plant species (Quick, 2015: 86). This area is a natural wonder that forms part of the Cape Floral Kingdom and it is part of only six floral Kingdoms in the world. Refer to Figure 81 and 82. It was declared a world heritage site in 2004 by UNESCO, the United Nations Educational, Scientific and Cultural Organisation (CapeNature, 2020: online).

The name Cape Floral Kingdom is given since this region is one of only 6 regions that has the highest concentration of plant species in the world. "It contains an estimated 9 500 species, of which 70% do not grow anywhere else in the world" (CapeNature, 2020: online). Only 9% of the biome is suitably protected, which is an alarming factor (CapeNature, 2020: online).

Cape Nature is involved in various activities to protect this region, for example, preventing fires, managing invasive species, and ensuring responsible tourism and urban development. Population growth in the Western Cape is one of the greatest threats for land and vegetation.

Therefore, I propose an interpretation centre to allow visitors to experience the site in all its reverence. Cape Nature is the proposed client, since they have nature's best interest at heart. Refer to Figure 79. They also manage the Cederberg's heritage sites. It is our duty as citizens of society to protect these areas before they are ruined and lost forever.

## WORLD FLORAL KINGDOMS



(Cederberg Park, 2020: online)

Figure 81: Cape Floral Kingdom



(Author, 2020)

Figure 82: Cape Floristic region



(Author, 2020)

Figure 83: Looking over the landscape from the stadsaal cave

Refer to figure 83 and 84 for sketches of the stadsaal caves.

### Glossary

**Fault:** "A planar or gently curved fracture in the rocks of the Earth's crust, where compressional or tensional forces cause relative displacement of the rocks on the opposite sides of the fracture" (Brittanica, 2020: online).

**Geoheritage:** A generic but descriptive term applied to sites or areas of geologic features with significant scientific, educational, cultural, or aesthetic value (Keweenaw Geoheritage, 2020: online).

**Geology:** the study of the particles and matter that makes up the earth surface (entrance-exam.net, 2020: online).

**Geomorphology:** the study of the outer surface of the earth. The study is related to the physical features of mountains, rocks and other substances found on the surface of the earth (entrance-exam.net, 2020: online).

**TMG** = Table Mountain Group

**Weathering:** disintegration or alteration of rock in its natural or original position at or near the Earth's surface through physical, chemical, and biological processes induced or modified by wind, water, and climate (Brittanica, 2020: online).

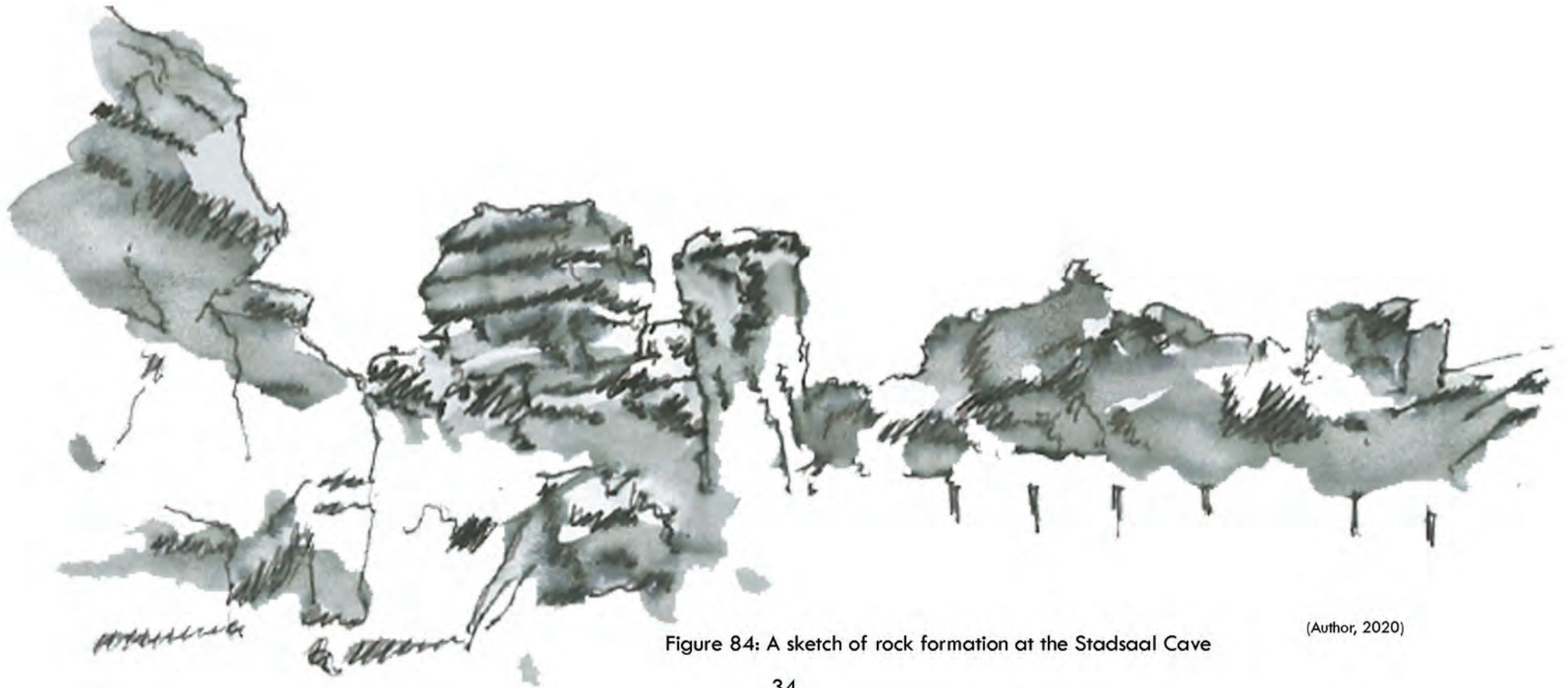


Figure 84: A sketch of rock formation at the Stadsaal Cave

(Author, 2020)

The following information will discuss how the in-depth site investigation inspired the design process.

### Geomorphology:

There are two river catchments that demarcate the Cederberg. One is the Olifants River that is located on the west, and the Tanqua-Doring River system to the east. The proposed site is closest to the Matjiesriver, which feeds from the Doring Rivier. Refer to Figure 13, page 11.

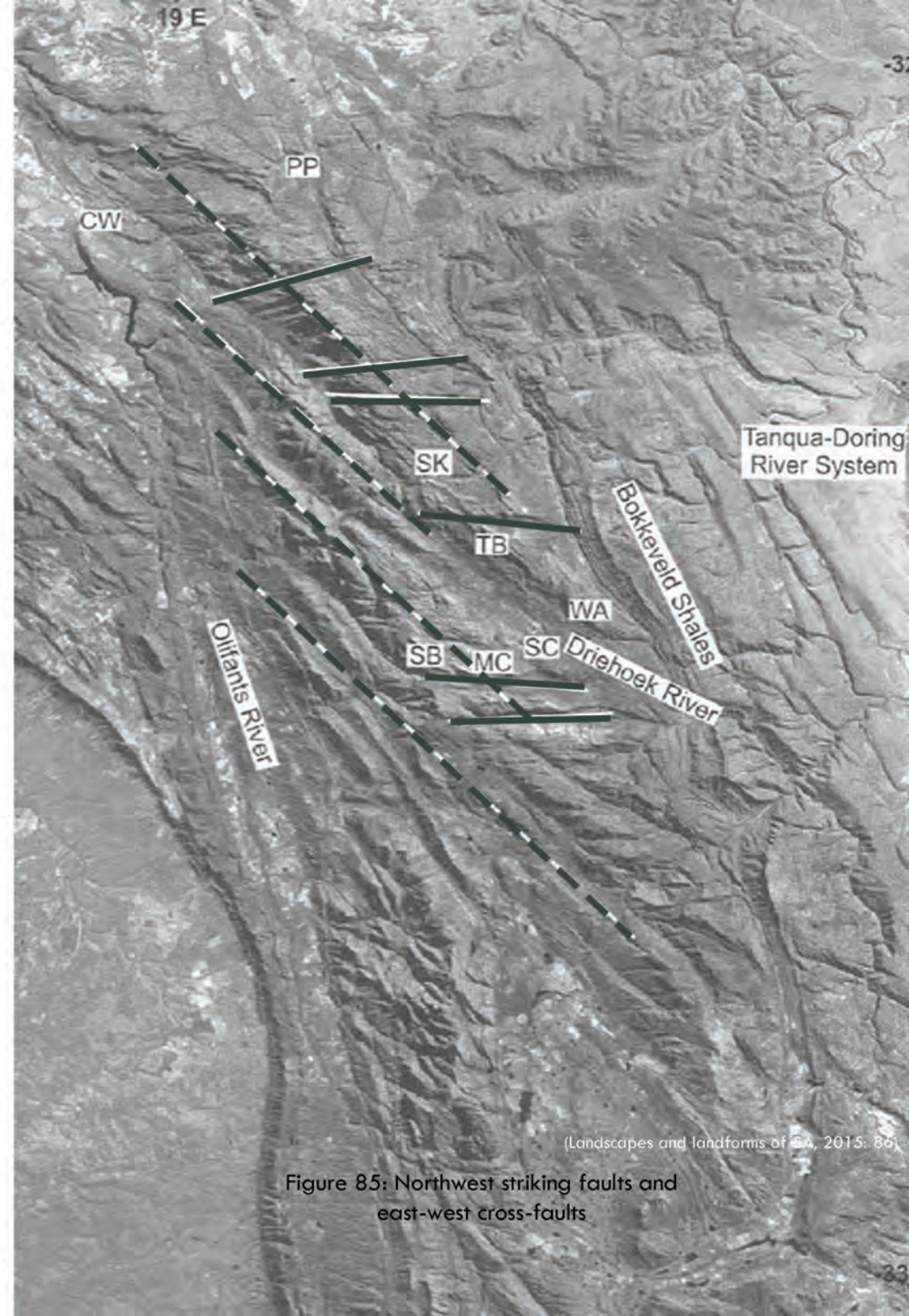
The Stadsaal cave region is mainly made up of the Table Mountain Group (Whitfield, 2015: 64). Sedimentary rocks in this group were formed by northwest striking faults as well as east-west cross-faults. Upright folds in the sedimentary rocks are the result of the natural erosion (Quick, 2015: 86). Referring to figure 85, the north-west striking faults are the dashed lines and the east-west-orientated cross-faults are the solid lines shown on the map. These winds are the result of the Stadsaal Cave as it sculpted the sandstone over millions of years.

Extraordinary rock formations can be found in the Cederberg that are sculpted by weathering and natural erosion (Quick, 2015: 86).

The Peninsula, Pakhuis, Cederberg formation as well as the Nardouw Subgroup of the TMG mainly make up the Cederberg (Quick, 2015: 87). Refer to Figure 86 - 89. The Stadsaal Cave and the Elephant Cave itself is made up of the Nardouw Subgroup, which is a thin layer of about 700mm thick. This layer can seem redder than the sandstones of older Peninsula formations, which tend to give the site an orange colour.

In-between the Nardouw Subgroup, one will find the Cederberg formation, which is a layer of about 50-120m thick. Refer to Figure 88 and 89.

Large-scale patterns of weathering and erosion results in geological patterns in the landscape. These patterns can tell us about the history of the landscape and the type of soils one can find in the landscape.



(Landscapes and landforms of SA, 2015: 86)

Figure 85: Northwest striking faults and east-west cross-faults



Figure 86: Bokkeveld Shales

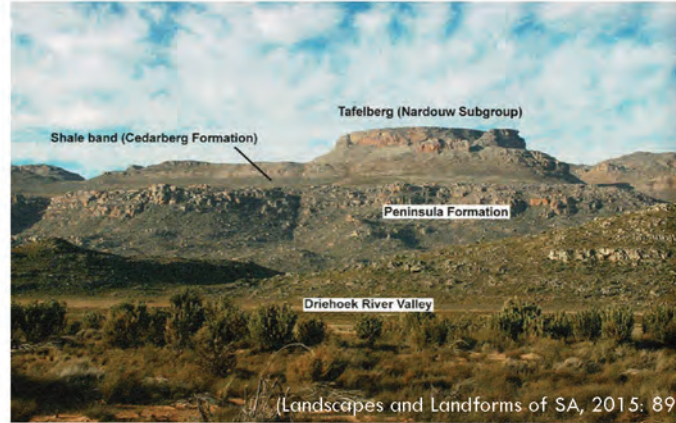


Figure 87: The Peninsula Formation

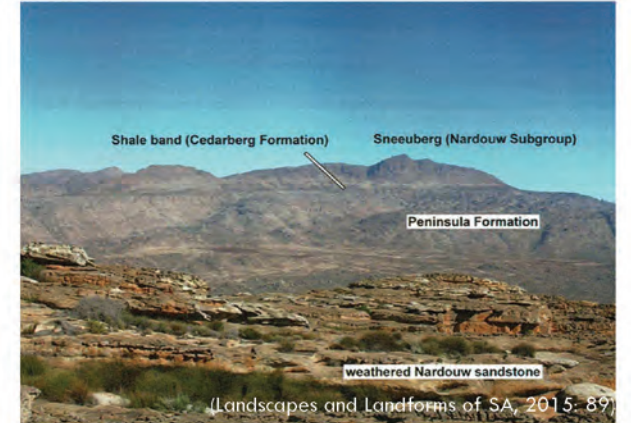


Figure 88: Nardouw Subgroup

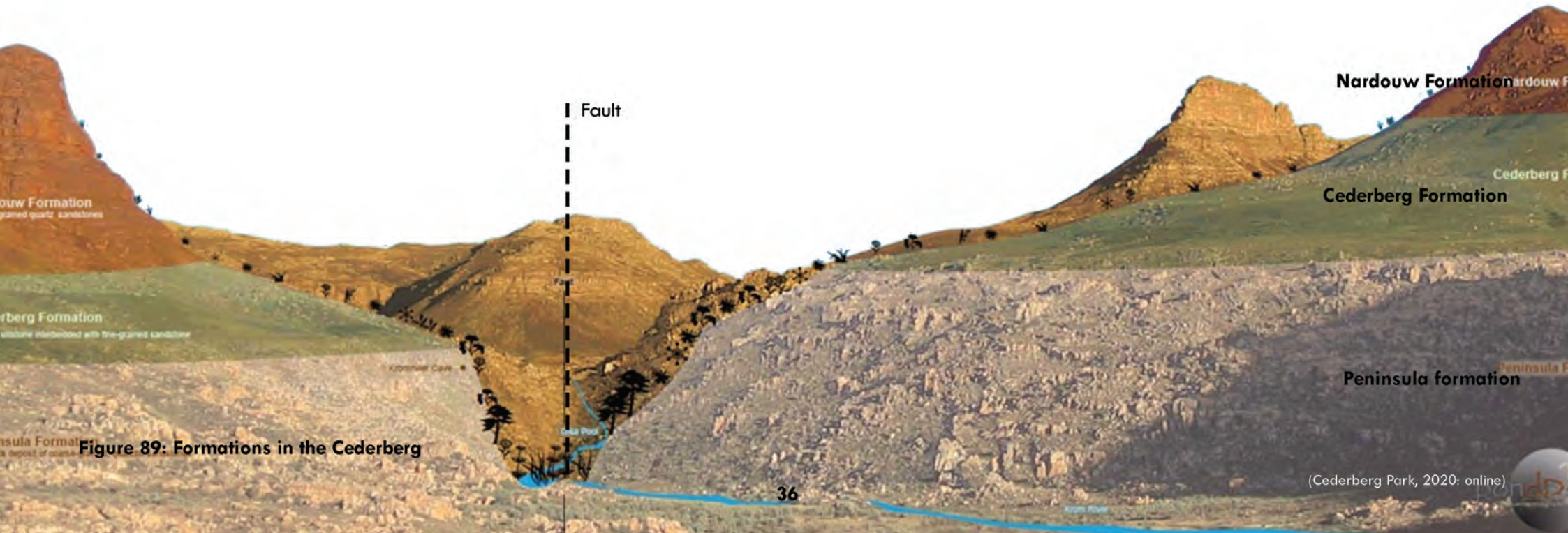


Figure 89: Formations in the Cederberg





(Author, 2020)

Figure 90: The proposed design as a new 'layer' on site



(Author, 2020)

Figure 91: Rock formations in the landscape



Figure 92: Stadsaal Cave



Figure 93: Design development inspired from geomorphology

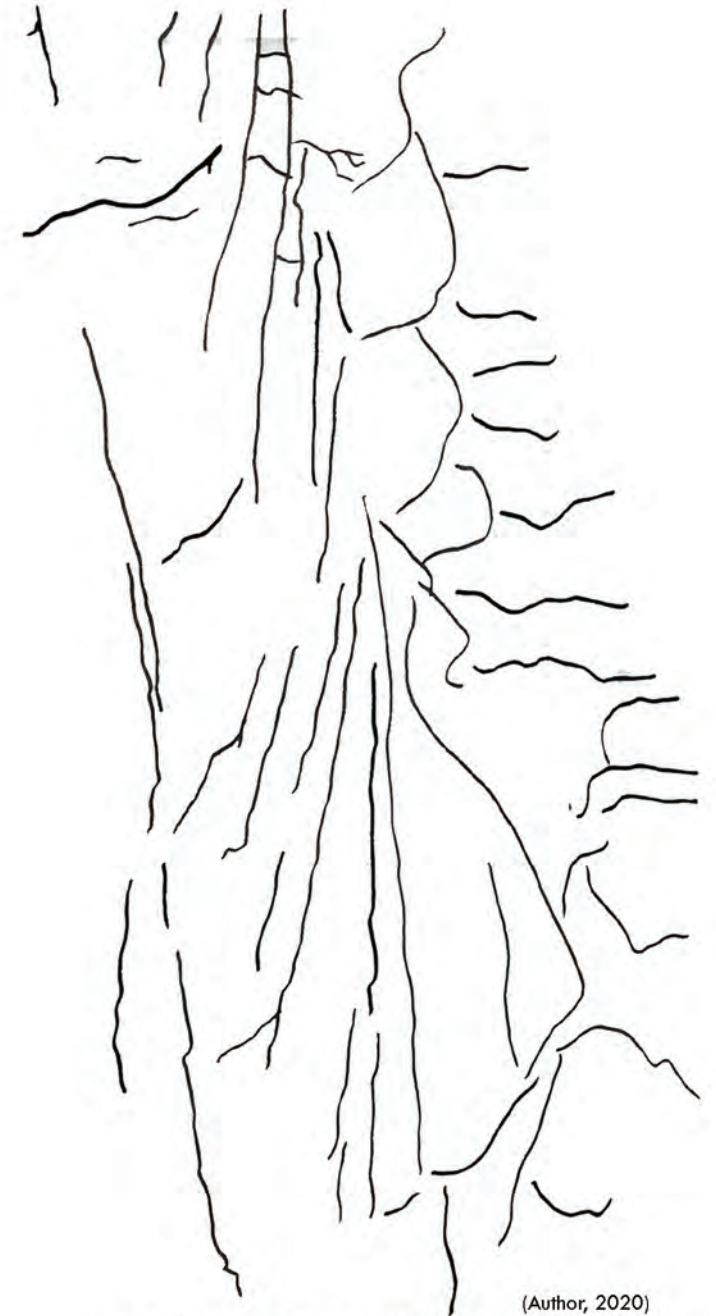


Figure 94: Design development inspired from geomorphology



Figure 95: Rock formations in the landscape



Figure 96: Entrance inspiration from geomorphology

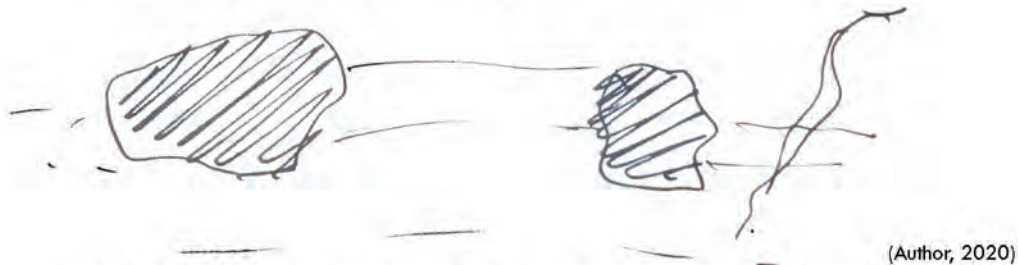


Figure 97: Accommodation inspiration from geomorphology

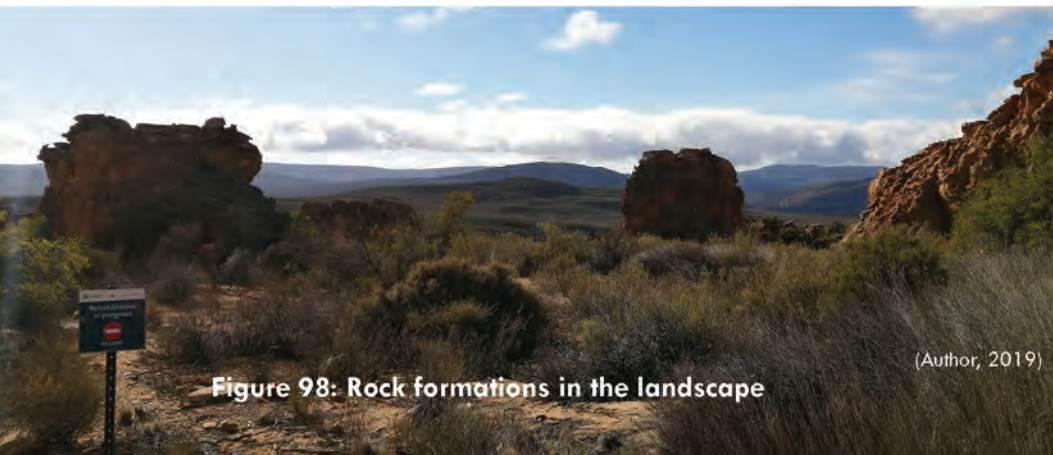


Figure 98: Rock formations in the landscape

An in-depth analysis informed the design process, as it would inspire clues to design a building that would suit the landscape. Several floor plans were examined in the landscape, but the natural sculpted lines in the geomorphological features had the answers embedded within them. Refer to page 37 - 41.

One will find that slope processes and river patterns greatly suggest the geologic control across the Cederberg (Quick, 2015: 91). One can thus say that the Cederberg is made up of rivers, weathering and erosion. Refer to Figure 13, page 11. When looking at the orientation of rivers, upland rivers are usually in V-shaped valleys, which meet bigger rivers at 90° angles (Quick, 2015: 91).

These V-shaped valleys are not only clearly shown on plan, but are suggested in geomorphology as well. Refer to Figure 99 - 102. It inspired the layout of the design in the landscape, one would move through the natural stone formations and the building would expand into the landscape with numerous walkways. Refer to Figure 92, 93, 103 - 105.

Areas that contain weathered sandstone have loose pieces on the surface, which clutters bedrock slopes and can lead to rockfalls. These loose rocks informed the accommodation units of the design in terms of being secluded in the landscape. By doing this, the visitors can have a unique, private experience within the landscape. Refer to Figure 97 and 98.



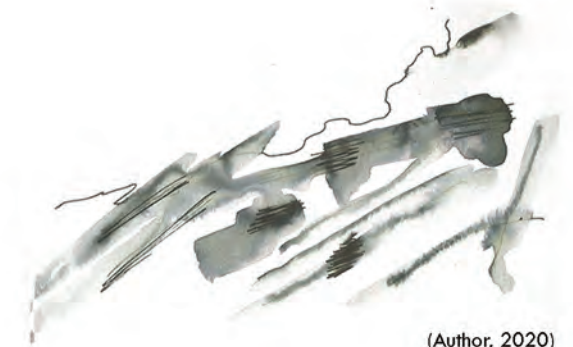
(Author, 2019)  
Figure 99: Design development inspired by geomorphology



(Author, 2020)  
Figure 100: Plan development derived from the geomorphology of the site.



(Author, 2020)  
Figure 101: V-shaped valleys



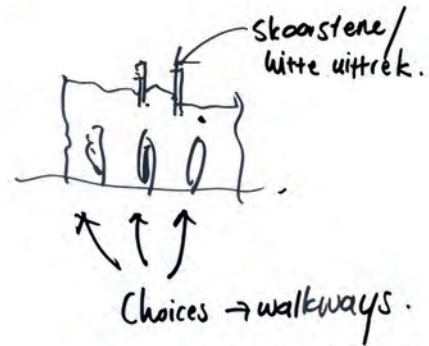
(Author, 2020)  
Figure 102: A sketch of the geomorphological layers



(Author, 2019)

Figure 103: Geomorphological inspiration in the landscape

MASS WITH PORTALS.



(Author, 2020)

Figure 104: Different walkways inspiration



(Author, 2019)

Figure 105: Different walkways inspiration

## Sandstone weathering:

The Stadsaal Cave and the Elephant Cave are both examples of sandstone weathering, which is one of the Cederberg's most unique characteristics. Refer to Figure 106.

Sandstone weathering is the result of chemical and physical weathering of TMG sandstone (Quick, 2015: 91). One can identify it by looking out for its original red-orange staining along joints and on exposed surfaces. Refer to figure 106 - 109. The oxidation of iron compounds embedded within the rocks shows the red-orange colour on the rocks (Quick, 2015: 91).

Even though TMG sandstone has a highly resistant characteristic, caves are quite common in the upland rock surfaces. These features are results of chemical weathering processes, which inspired the conceptual approach of palimpsest and layers. The concept

suggests layers of memories to explore on site that formed over a long period of time. Materials such as Corten steel suggest a temporal aspect and will fit suitably in the landscape with its weathering and colouring features. Refer to page 44.

Examples of large-scale physical weathering features in the Cederberg are the Wolfberg Arch (15m in diameter) as well as the Maltese Cross (20m high) (Quick, 2015: 91). Refer to figure 107 - 109. "...physical weathering are results of changes in the fracture intensity, rock strength as well as cementation and porosity-permeability patterns..." (Quick, 2015: 91). The process of physical weathering inspires the form giving of the design in terms of how the landscape could sculpt the walls of the design, which is also another concept, following the narrative. Refer to page 45.

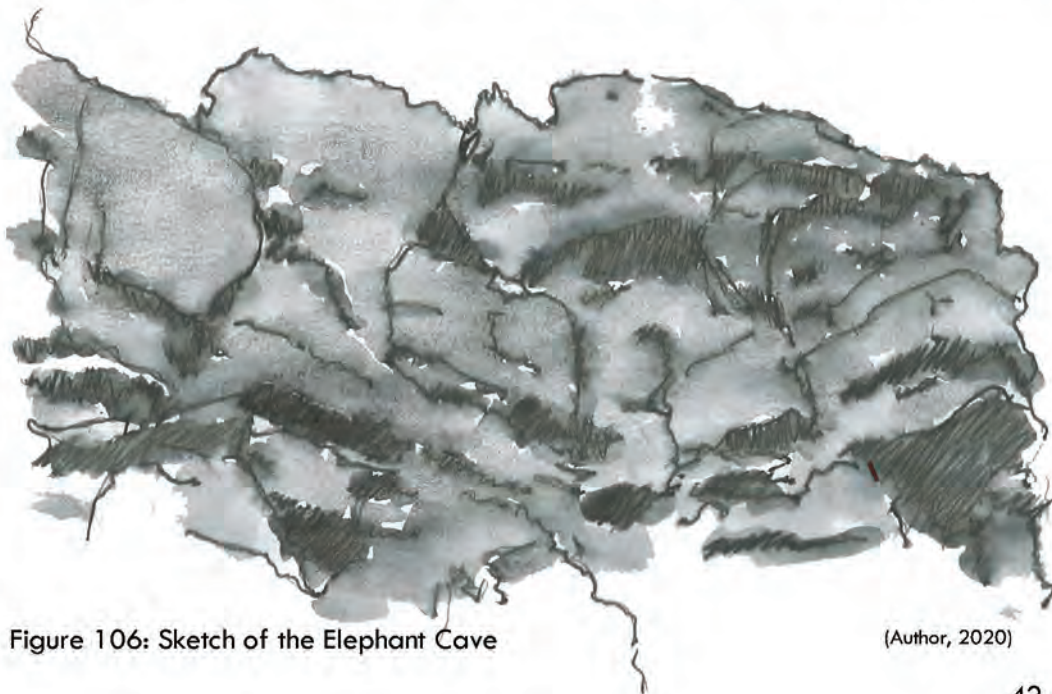


Figure 106: Sketch of the Elephant Cave

(Author, 2020)



(SafariNow, 2020: online)

Figure 107: The Maltese cross



(Arne Purves, 2012: online)

Figure 108: The Wolfberg Arch



(Arne Purves, 2012: online)

Figure 109: The Wolfberg Arch

The concepts are site specific because the site had clues as to where the design should lead. The concepts are layered, following the narrative as well as framing the landscape, Refer to Figure 110 - 112.

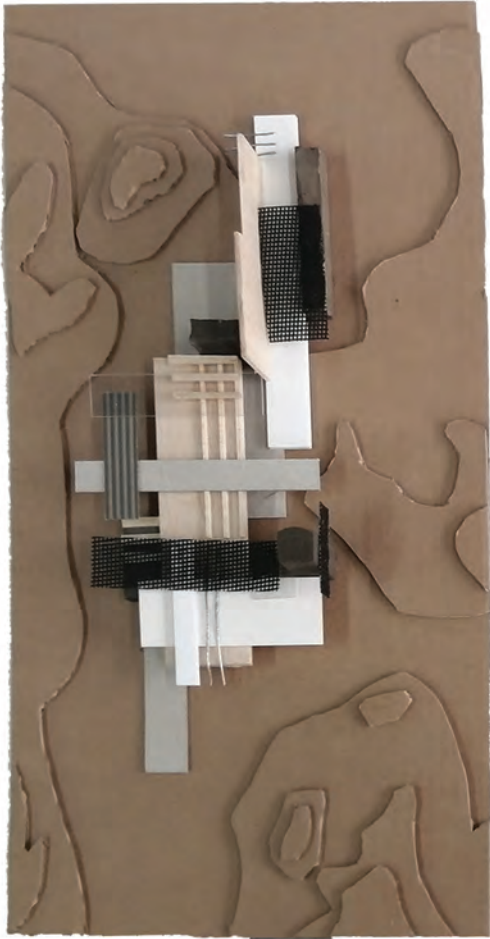


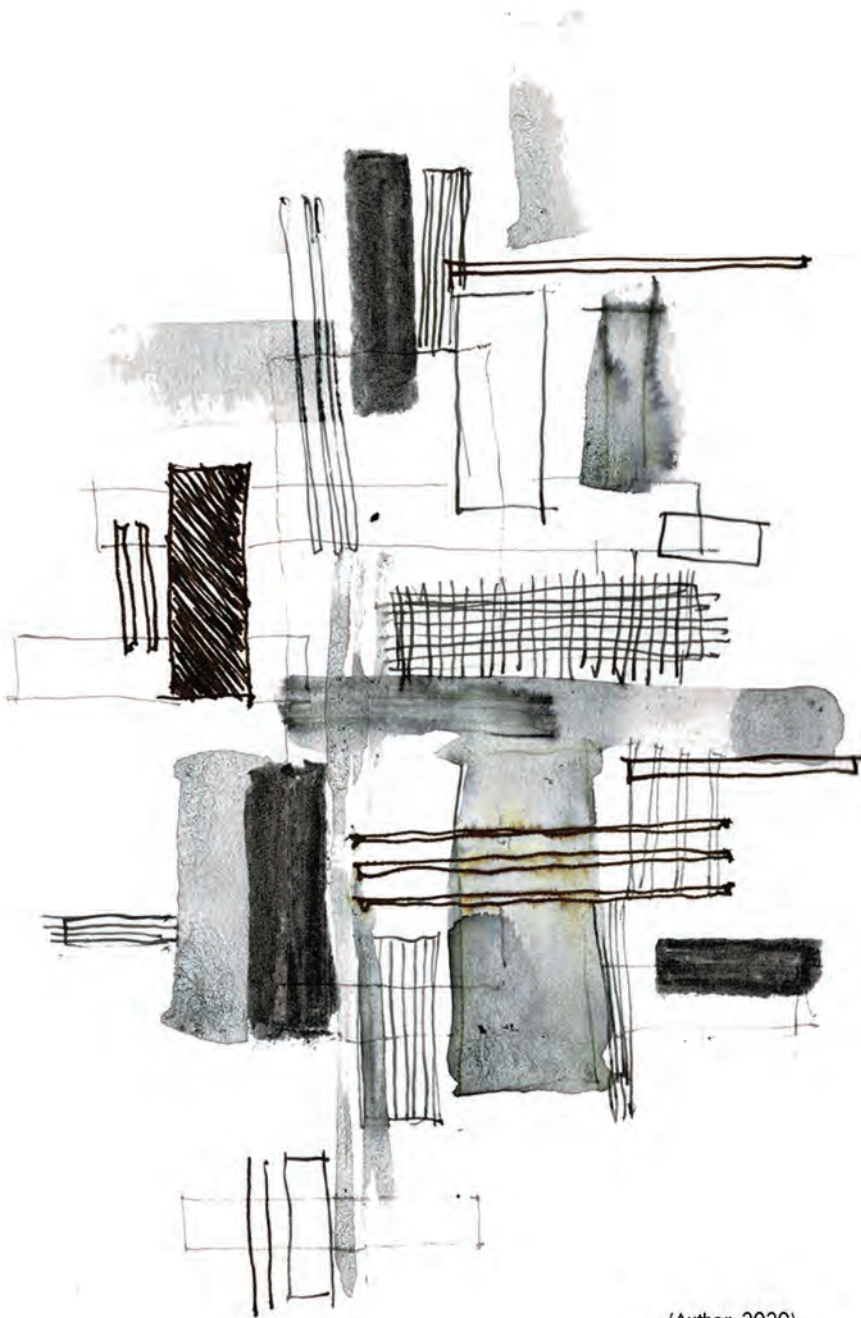
Figure 110: Layered  
(Author, 2020)



Figure 111: Following the Narrative  
(Author, 2020)



Figure 112: Framing the landscape  
(Author, 2020)



(Author, 2020)

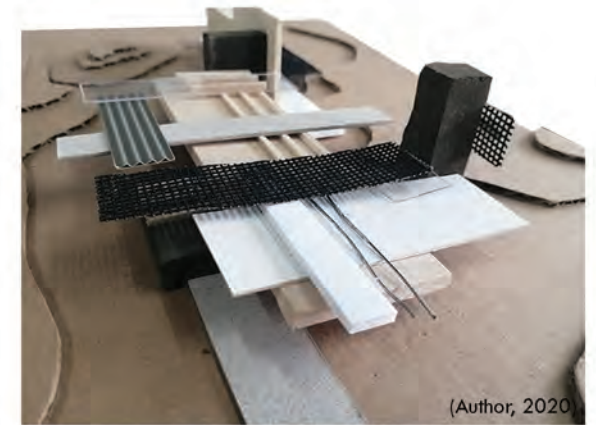
Figure 113: Conceptual sketch

### Concept 1: Layered

Palimpsest: “If you are writing fast and hastily erase something not quite all the way and continue writing right over the smudgy bit, then you’ve created a palimpsest — which means you can see traces of the earlier writing mixed in with the new” (vocabulary, 2020: online). Thus, referring to the different layers that are formed over time on the site.

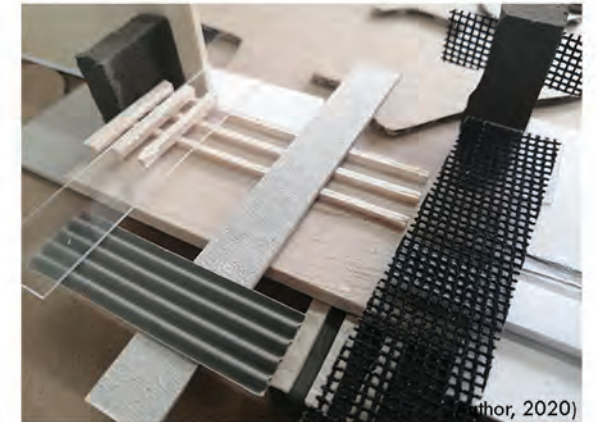
Different layers of colour are found on the caves, in the soil as well as the Fynbos vegetation itself. These colours change over time due to season change and form an in-depth layered experience, which is an inspiration to the design approach. Refer to Figure 113 - 116.

The Touchstone also referred to a layered experience such as the earth, fire and seed conservation, with a temporal aspect to it. Refer to page 52.



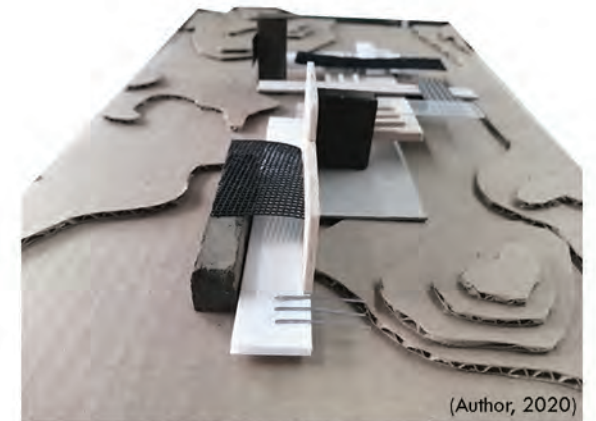
(Author, 2020)

Figure 114: Layered



(Author, 2020)

Figure 115: Layered



(Author, 2020)

Figure 116: Layered



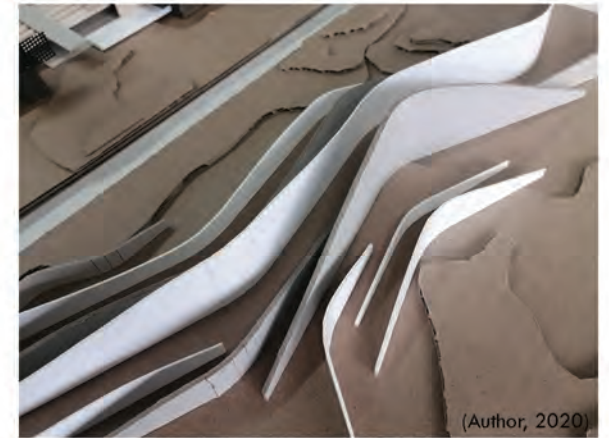
(Author, 2020)

Figure 117: Conceptual sketch

## Concept 2: Following the narrative

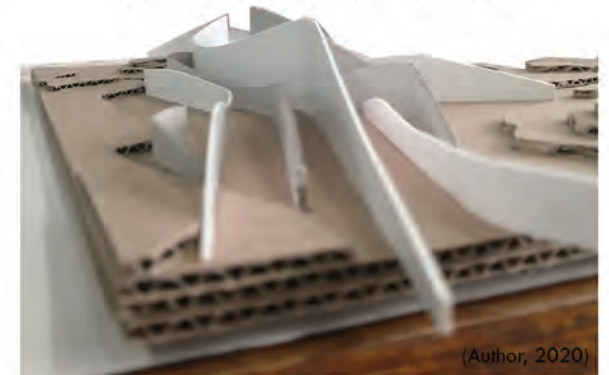
“The geomorphology of the region is strongly controlled by bedrock structures, which illustrates the close relationship between geologic and geomorphic patterns of landscape evolving over long timescales” (Quick, 2015: 85).

The contours on site are a metaphor to the earth, which sculpts itself naturally. The idea is to follow these natural sculpted contours with a sensitive approach. The contours can also be a form of memory, and a narrative that is derived from the existing landscape, as there is so much history on site from signs of bushmen to natural erosion. Refer to Figure 117 - 120.



(Author, 2020)

Figure 118: Following the narrative



(Author, 2020)

Figure 119: Following the narrative



(Author, 2020)

Figure 120: Following the narrative

### Concept 3: Framing the landscape

The Cederberg is popular for its astonishing rock formations. These rock formations are the outcome of natural erosion as well as weathering of the folded and faulted Ordovician and early Devonian sandstones and mudstones of the Table Mountain group (Quick, 2015: 85). Refer to Figure 121 - 124.

The Stadsaal Caves were analysed for being such a natural wonder. Especially the way that the spaces are carved out and formed over time. The Stadsaal caves frame nature with their eroded spaces that were once, and still are the effect of natural erosion. Refer to page 38.

The term, 'Vensterklippe', is also used in the Cederberg, which refers to the rocks that form window frames that frame the landscape essentially. Refer to Figure 24 and 25, 61 and 64.

Therefore, framed was chosen as a concept, as the proposed design will frame the landscape as one moves through the spaces.



Figure 121: Conceptual sketch

(Author, 2020)



Figure 122: Framed

(Author, 2020)



Figure 123: Framed

(Author, 2020)



Figure 124: Framed

(Author, 2020)

## Vegetation in the Cederberg

When Andrew Sparrman arrived in Cape Town in 1772, he made a note in his journal that stated: 'At first almost every day was a rich harvest of the rarest and most beautiful plants' (Manning, 2007: 8). He knew back then, that what he had discovered was something special. The Cederberg consists of the Fynbos biome, as well as the succulent karoo biome, as mentioned before. Refer to Figure 125.

The Fynbos biome consists of two vegetation groups, namely Fynbos and Renosterveld (Cederberg conservancy, 2020: online). One will find the Fynbos more towards the western side of the Cederberg and to the eastern side, the Succulent Karoo. A good margin for the transition of the biomes is the road that leads to Wupperthal, from Ceres (Cederberg conservancy, 2020: online). Refer to Figure 136.

My chosen site is in the margin of this transition. Therefore, the site will contain both fynbos and succulent karoo plant species.

Fynbos shows off its beautiful brightly coloured spring flowers, such as vygies, daisies, irises, lilies and orchids after a good amount of rain during Winter, which attracts tourists from all over the country each year, who want to see the flowers. Refer to Figure 130 and 132. This poses the opportunity for another great tourist attraction to the site and the need for people to understand this delicate vegetation group in order to protect it.

The Succulent Karoo vegetation that is more towards the east of the Cederberg can be identified by the presence of vygies, daisies, gifmelkbos, botterboom and the rare 'gifbol', found on this landscape. Refer to Figure 126 - 129.

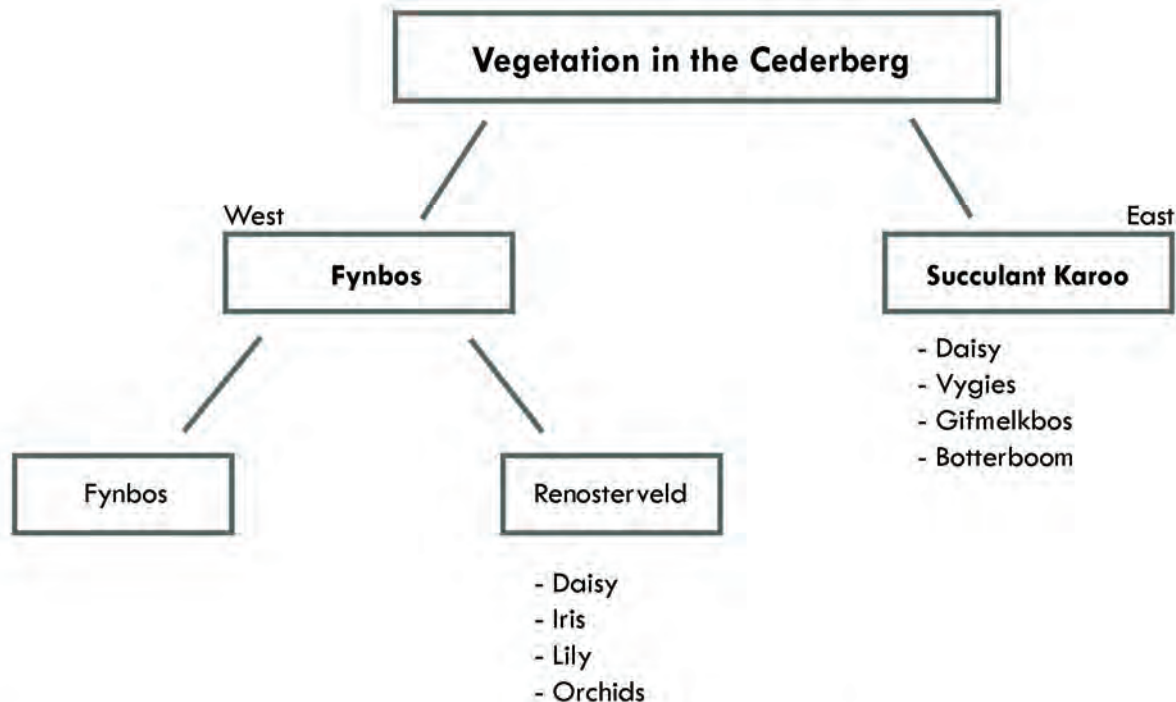


Figure 125: Diagram showing the vegetation groups in the Cederberg (Author, 2020)

### Succulent Karoo:



Figure 126:  
African daisies



Figure 127:  
Botterboom



Figure 128:  
Daisy



Figure 129:  
Vygies

Another unique species is the Namaqua fig, which simply grows on the rocky landscapes, embedded in-between the rock. Refer to Figure 131.

Luckily, succulent Karoo does not burn easily as it contains more sap than the dry fynbos, which burns very easily (Cederberg conservancy, 2020: online). This means that the proposed site is better protected from fires than the rest of the Cederberg, where only fynbos occurs. The vegetation is also more scattered over the landscape in the east, than the lush Fynbos to the west of the Cederberg.

Figure 130: Flowers during blooming season



Figure 131: Namaqua



Figure 132: Fynbos vegetation

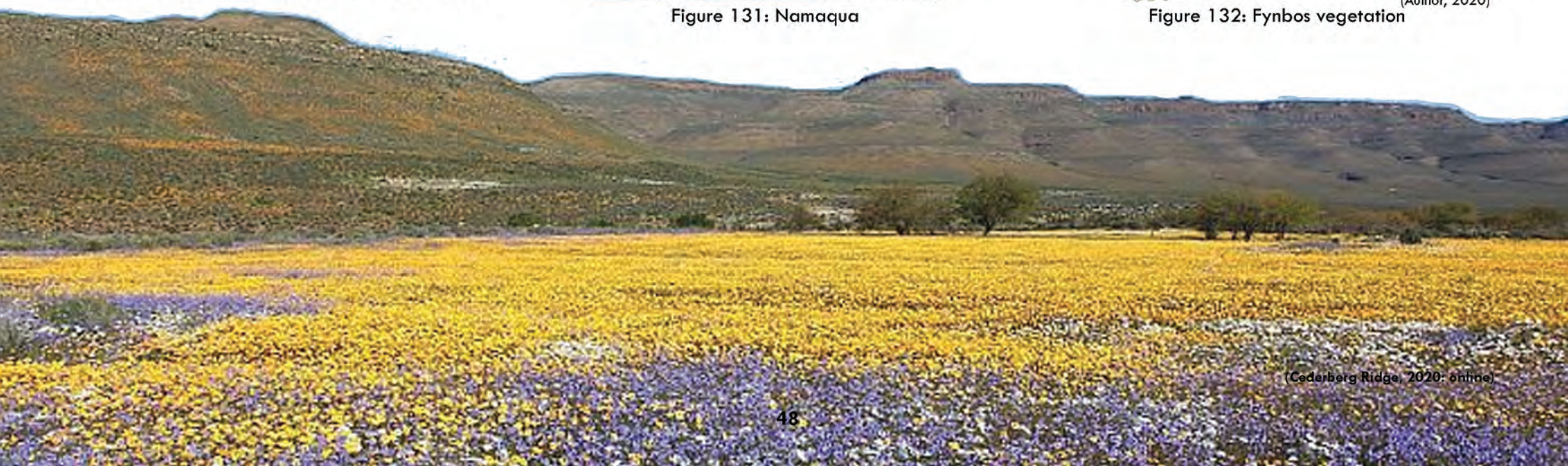


Figure 133: Fynbos  
(fynbosguy, 2020: online)



The following section will discuss fynbos in all its beauty.

### Background and overview

Fynbos can be defined as an evergreen plant that has hard leaves and occurs in the shrubland on soils that are nutrient poor. It will not grow where droughts occur as it needs a rainfall of no less than 400mm per annum (Manning, 2007: 10).

Fynbos will rarely show dominance of only one species, except in smaller areas. It is so diverse that you will find about 121 different species in a single 100m<sup>2</sup> (Manning, 2007: 12). The English explorer, William Burchell, noted in his journal in November 1810 that the Fynbos flora in the Cape should be considered a botanical garden as a new discovery was made with every step he took, (Manning, 2007: 8).

The plants are about 1-3m tall, often with taller bushes poking out above the canopy. Therefore, the decision was made to keep the proposed building a single storey to translate the height of the fynbos.

One will rarely find any trees between fynbos, this is also evident on the proposed site, except for trees growing in-between the rocks, like the Namaqua fig (Manning, 2007: 11). 20% - 25% of fynbos mainly consists of 5 families, from the 100 or so families that exist. These families are Erica, Protea, Restio, Citrus and Iris families (Manning, 2007: 12). Refer to Figure 134, 135 and 144 - 146 for examples.



(Author, 2020)

Figure 134: Daisy



(Author, 2020)

Figure 135: Rooipleister bos



Figure 136: The road leading from Ceres into the Cederberg  
(Google maps, 2020: online)

## Fire and Fynbos:

I was very intrigued by fynbos when I read about the following, "Fires are more common in Fynbos than in any of the other heathlands around the world" (Manning, 2007: 15).

Fynbos is a fire-adapted vegetation. This means that fynbos is dependent on fire to survive; thus, the inspiration for the touchstone on page 52. Without regular fires, all fynbos species will be dominated by trees (Manning, 2007: 15).

This is very interesting, as this process can be related to a building's lifespan. An average masonry building can survive for 60-120 years, depending on the material use (Donnelly, 2015: online).

This informs my design process by means of 'temporal' materials. Materials that take temporality into consideration, such as Corten steel, can be very site specific as it also turns orange over time, just like the caves that are exposed to the elements.

Fires are critical to fynbos due to the fact that it rejuvenates the vegetation and recycles essential nutrients back into the soil. When the fynbos burns down to the ground, sunlight can reach the soil again, where shaded leaf canopies were before to add nutrients to the soil. (Manning, 2007: 15). Refer to Figure 137 - 139.

Fires occur every 10-14 years, and species with bulbs and short-lived species may need more frequent fires. This is, however, a very delicate process as the shrubs only reach their maturity after a few years. When they burn too frequently, they can become endangered. Too many fires can occur because of human activities as well as climate change (Manning, 2007:16).



Figure 137: Flowers coming up after a fire



Figure 138: Flowers coming up after a fire



Figure 139: Fynbos fire

## Touchstone

### Conserving the Fynbos biome and creating awareness thereof

The Touchstone comprises of a concrete base with grooves and holes cast in it to hold frozen Fynbos seeds, as the ice melts the seeds are released into the 'poor-nutrient' soil. Refer to Figure 140 and 141. A layer of steel wool is placed between the seeds and lit up to illustrate a fynbos fire, which as mentioned before, is a very critical aspect of the Fynbos biome. Refer to Figure 142.

The Cederberg itself is a mystical piece of land, especially because thus far, scientists can't pinpoint how this area can have such a diversity of plants with such

a poor nutrient soil, therefore, the use of concrete and not a more natural material for a base (Poulsen, 2014: online). The frozen seeds also refer to the conservation of the fynbos biome.

After the ice has melted, the water runs down the side of the base to refer to a much bigger landscape of fynbos than illustrated in the touchstone. A unique concrete smell occurs, which refers to the unique smell of fynbos after a night's rain.

All these elements evidently refer to the natural way of fynbos conserving itself, using natural elements such as fire, water, and wind. All we need to do is to preserve it.



Figure 140: Touchstone  
(Author, 2020)



Figure 141: Touchstone while ice starts to melt and release the seeds slowly into the poor-nutrient soil  
(Author, 2020)

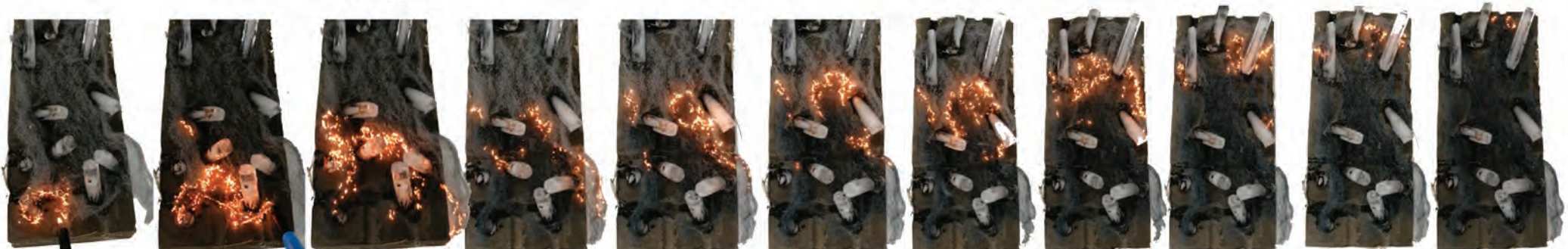


Figure 142: Burning of steelwool on the touchstone representing a fynbos fire.  
(Author, 2020)

## Seeds

There is a limitation on the production of seeds due to the fact that fynbos grows in nutrient poor soils.

Seed production in the protea, for example, is extremely low, the average seed production statistic is from 6% to 9% (Manning, 2007: 20). Some species' seed maturation can take a long period of time, months even. This allows for the production of nutrients to excel and provide the plant with the necessary nutrients to create their seeds. Therefore, it is essential to protect the fynbos and to create an awareness of the time frame of these plants, to prevent over exploitation of the vegetation.

The ash that falls onto the ground surface after a fire provides the soil with the necessary nutrients for growth in plants. Therefore, one will notice a large amount of flowering directly after a fire. Refer to Figure 137 and 138.

## Roots

The fynbos species adapts its mineral intake, as different areas have different types of soil. The fynbos plant has a symbiotic relationship with a fungus named mycorrhiza, this means that both the fynbos and the fungus benefit from one another (Manning, 2007: 17). It reaches into the ground, beyond the root system of the plant, and extracts the poor nutrients from the soil such as nitrogen and phosphorus. Nitrogen and phosphorus are then released to the root in exchange for carbohydrates. Refer to Figure 143. This process is commonly found in Erica's (Manning, 2007: 17). Refer to Figure 144.

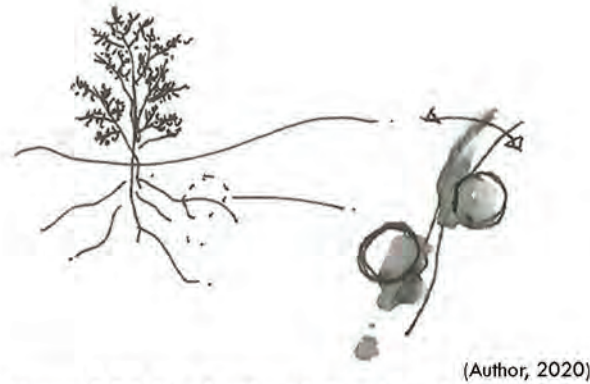


Figure 143: Symbiotic relationship of root and fungus.



Figure 144: Erica



Figure 145: Restios



Figure 146: Pea family

The design and the site could have a symbiotic relationship with one another. The site informs the design process and the building will provide the visitors with the necessary information of the landscape. Hopefully this will result in less threats towards nature.

## Flowers

The primary flowering time for fynbos is from September to October, during Spring. However, only 60% of fynbos species bloom in Spring. A fifth part of fynbos can bloom at any time of the year (Manning, 2007: 18).

The Amaryllids family are known for blooming in Autumn. The reason for all fynbos species not blooming at once is because of the competition for pollination.

Amaryllids ensure that they shed their seeds before the winter, thus flowering at the end of Autumn. Refer to Figure 147.

This results in a constant tourist attraction not only to the geomorphology but in terms of the vegetation as well.



(Grainio, 2020) online

Figure 147:  
Amaryllid

### Fynbos conservation

Fynbos is such a diverse biome found within such a small area; however, that is also its downfall. Concentrated areas of species can become extinct faster. Two thirds of fynbos species are endemic and nearly a third are either rare, or endangered (Manning, 2007: 23).

Threatened species have grown rapidly since 1997. For instance, the protea family's number of threatened species has risen by 38%, from 22% to 60% (Manning, 2007: 23).

The greatest threats to fynbos are human activities such as urban development, agriculture and silviculture. Refer to Figure 148. One would think that only lowland species are in danger because of urban development, but because fynbos can be used for medicine, herbs and tea (such as buchu and rooibos), strain is placed on the highland species as well (Manning, 2007: 23). Another threat is alien vegetation such as Australian wattles and hakea (Manning, 2007: 23). Too many fires also pose a threat to fynbos that will not be able to recover in time.

In the end one can say with confidence that fynbos is such a unique biome and to conserve it is out of the question, however, it has to start with every individual taking responsibility upon themselves to respect and protect our nature reserves, and to support them.

Figure 148: Threats to Fynbos:

(Author, 2020)



Urban development



Agriculture



Silviculture



Alien vegetation



Figure 149: Cedar seedling

(CapeNature, 2017: online)

Among all the Fynbos, the Cederberg is also home for its unique Clanwilliam Cedar tree. Refer to Figure 150. There are numerous community projects involving the Cedar tree as this tree is on the verge of extinction.

### Challenges

There are only 13 000 – 15 000 Clanwilliam Cedar trees left in the Cederberg region. Long-term monitoring of data indicated a rapid loss of the tree population between 1977 and 2003 (Folb, 2019: online).

The Clanwilliam Cedar tree is the only tree that survived the last Ice Age period (Folb, 2019: online). This also means that the tree's preferred climatic conditions for growth is in very cold areas, where snow occurs. Thus, it is evident that climate change has relentlessly disturbed Clanwilliam tree populations.

Rika, the Cederberg wilderness conservation manager, stated in an interview done by Weekend Argus that: "Over 200 years ago, you would have found these trees all over the Cederberg, but this number has significantly dropped due to climate change. We have been in a climate change since the last Ice Age." (Folb, 2019: online).

The tree is near extinction because it was used for furniture, telephone poles, construction and the threat of fires.



(Portfolio collection, 2020: online)

Figure 150: The Clanwilliam Cedar tree at high, rocky mountain tops to protect itself from fire.

## Conservation of the Cedar tree

This tree is labelled as critically endangered on the Red Data List (Cape Nature, 2020: online).

Each year in May, Cape Nature hosts a tree planting ceremony in collaboration with Bushmanskloof in the Cederberg Wilderness Area to promote the planting of Cedar trees (CapeNature, 2020: online). The main goal of the event is to create awareness about the Cedar tree and to increase their numbers. Refer to Figure 151 - 153. The project has allowed for over 1000 trees to be planted already.

Each person that is present at this event will receive a tree to plant in the mountain tops of the Cederberg; allowing a physical action of contributing to the conservation scheme as well as enjoying the views that the Cederberg has to offer. When the tree is planted, a fire break is also created around it to prevent the fire from reaching the tree.

Cape Nature also works with partners and volunteers on another initiative to plant Cedar seedlings in the Cederberg mountains. About 8000 nursery-grown young trees are planted in the reserve each year (Cape Nature, 2020: online).

The Cedar tree topic has been chosen to be incorporated into the proposed design as it will create awareness among the visitors of the uniqueness and endangerment of the tree. There will be a dedicated cedar tree nursery space in the design. This will allow for a small research facility as well as space to grow the cedar seedlings.

This space will allow the visitor to learn about the Cedar tree and help to grow them. A Cedar tree can be bought, and the visitor could plant it in the reserve wherever they go. Perhaps the Cedar tree planting initiative does not have to be allocated to one day only, but a constant initiative to help in saving this tree.



Figure 151: Rika planting Cedar seeds with the community



Figure 152: A tree planting ceremony in 2014



Figure 153: Young Cedar tree planted at Heuningsvlei

## Survival of the Cedar tree

As mentioned before, fire is a great danger to Cedar trees, this is ironic as Fynbos is dependent on fires. Cedar trees are extremely sensitive to fire because it contains oil. According to du Plessis, a tree can burst into flames even when it is 30m away from the fire, the tree does not even have to be exposed to a physical flame (Folb, 2019: online). Once a Cedar tree burns, it is dead for life and it can only be grown from a seed again.

Currently, the biggest factor for the Cedar seedlings is water. Instead of having long rainy winters, there are only short irregular bursts of rain. The seed cannot germinate successfully in these conditions (Folb, 2019: online).

However, a Dutch invention by the company Groasis came to the rescue with their waterboxx invention. Refer to Figure 154. When these rain bursts come down, this waterboxx will trap the little bit of water that fell on the soil, the waterboxx can hold about 2 litres of water. The water then drips to the roots of the young tree to aid in the survival process of the tree. If the tree is big enough, it is planted out and the waterboxx is used for another seed to restart the process (Zietsman, 2019: online). The waterboxx has a 90% survival rate thus far (Cape Nature, 2020: online). It is of importance to make an effort to grow these trees as they are endemic to our country, and our Cederberg.

It is believed that the Cederberg can be seen as a very important landmark for South Africa because of its scenic value as well as its scientific value. Therefore, one cannot do anything else but to conserve this region with its geomorphology as well as its broad biodiversity. The Cederberg needs an interpretation centre to inform visitors of the region and its remarkable natural features.



Figure 154: Waterboxx for Cedar trees



Figure 155: Fire in the Cederberg

## Construction touchstone

As mentioned before, I found it ironic that the Cedar tree is endangered by fires, yet for fynbos, the fires are necessary in order for them to rejuvenate. Over time, the Cedar tree placed its seeds on high mountain tops between the rocky areas to protect itself from the fires. It is as if nature found the perfect balance of looking out for one another.

The structural system will consist of a concrete load bearing roof structure that will run over free formed walls. Thus, the spaces will be free from the roof structure. Refer to Figure 156.

The aim is to create a balance between the roof and the walls, just like nature found a balance for the fynbos and cedar tree, which will be filled in with a third structural system.

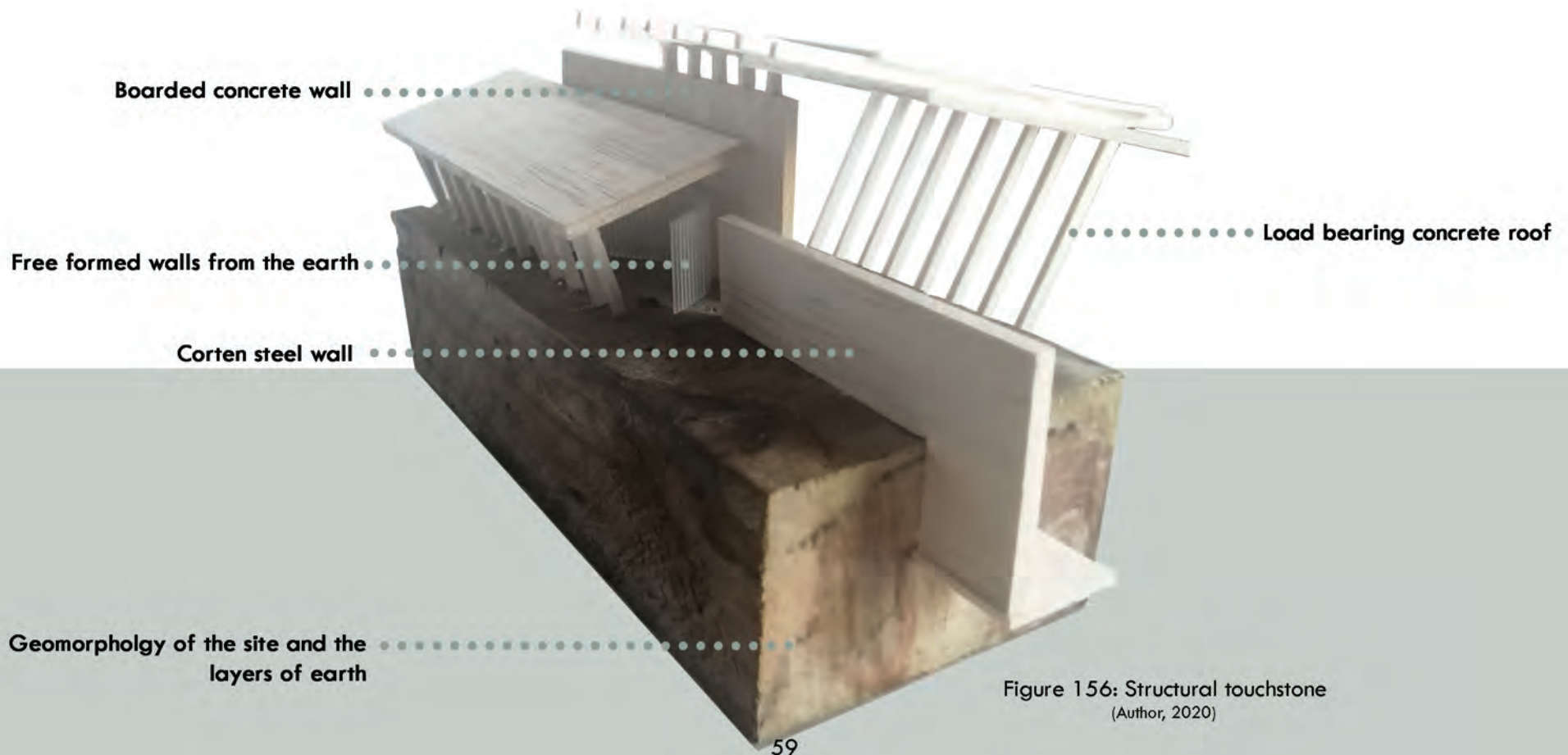


Figure 156: Structural touchstone  
(Author, 2020)



Figure 157: Reacting towards a space/  
landscape through your own experience.

(Author, 2020)

By investigating the site intensively, principles were derived from the context that can be applied to the design process. In correlation to this, the investigation of Richard Serra's approach to land art, Richard Neutra's philosophy of biorealism and Peter Zumthor's investigation into how presence can be created in architecture, will add towards the theoretical grounding of this dissertation.

### Richard Serra

Richard Serra is a well-known land artist, who specialises in steel artwork. He spent his entire career examining the subject of humanity's metaphysical bond with physical space (Barcio, 2016: online).

Phillip Barcio stated in an article, that philosophers

wonder how human beings interpret their relationship with the physical world. However, Richard Serra responds to the question of whether this occurrence happens independently of our senses. It does not matter if we understand the poetics or artistic qualities of an art piece, but whether we will know the physical properties of the piece.

Serra's goal is to expose the true self of an art piece, what we intuitively know thereof, and the site specifics of his work. "He became interested in how specific locations could inspire, inform and contextualise a work of art (Barcio, 2016: online).

The proposed design is site specific as it will respond to its surrounding context and eventually create an architectural sculpture in the landscape. The material

use will display its physical properties and the essence of the design's existence. One can learn from Richard Serra by choosing materials selectively. A certain sense of intuitive knowing occurs within a human being when stepping into a space, one will feel a certain way or expect to feel a certain way. Therefore, material use is extremely important when designing as it plays a big role in the 'feel' of the space.

Richard Serra designed a sculpture named the Te Tuhirangi Contour on Gibbs farm, in New Zealand, during 1999 to 2001. Refer to Figure 158.

Figure 158: Te Tuhirangi contour



(Architect.com, 2020: online)

The Te Tuhirangi Contour is a 257m long piece of steel, contoured specifically to its site. Sigrun refers to it as a delicate quality or a dark ribbon that curls and floats in the landscape (Sigrun, 2015: online).

One can see the structure 'collecting the volume of land' from far, but up-close, "materiality of mass and form impose themselves dramatically as something more felt than seen (Sigrun, 2015: online)." An endless open grass meadow with rolling hills, falling and rising, creates curvilinear contours suggesting the conceptual approach to be site specific. Refer to Figure 159.

It was chosen to analyse this sculpture especially for the emphasis on it being site specific. The manner in which the sculpture performs with the site and not against it is one of the approaches towards the design. Sculpting the landscape was one of the concepts that was informed by this. Refer to page 45. One should allow the landscape to inform the morphology of the structure rather than imposing an object into the landscape. Refer to Figure 160.



(Author, 2020)

Figure 159: Te Tuhirangi Contour on the hills



(Author, 2020)

Figure 160: Allowing the site to inform the morphology of the design



(Author, 2020), inspired by:  
(leonferrari.com, 2020: online)

Figure 161: Deep seated needs: Curiosity towards the understanding of the site.

## Richard Neutra

The architect, Richard Neutra, was always extremely aware of his surroundings. He was obsessed with how architecture impacts the human life. His philosophy, biorealism, states that, "human beings have certain deep-seated needs, and that we had better know what they are -physiologically, psychologically, and in terms of their sensory and spiritual constitution (Marlin, 1989: viii)."

It is believed that the deep-seated needs of the visitor of the proposed site are the curiosity towards the understanding of the site and how these geomorphological features are formed. Refer to Figure 161. Just like Richard Serra's land art, people that may visit the proposed site will be nature lovers and will be interested in the environment. The proposed design will intend to express the understanding of the site. Neutra always had a nature-near, true-to life approach to his designs whether it was architectural, urban, or environmental design (Marlin, 1989: xii). Refer to Figure 163.



(Author, 2020)

Figure 162: Free flow of circulation

Even though Neutra was a modernist designer, using rigid forms and sharp corners, he still believed in keeping his designs open and flowing toward a “perfect freedom from rigidity” (Marlin, 1989: XV). On the proposed site, a free flow of circulation that forms part of the landscape is implemented. Refer to Figure 162. These circulation routes all lead towards the Stadsaal cave, which celebrates the geomorphology on site whilst being exposed to Fynbos on route. This creates a direct connection to experience the site. Refer to Figure 163.

Neutra believed in only pursuing work in all honesty, otherwise it could become a dangerous play of becoming artificial (Marlin, 1989: xviii). Everything that he created had to be a masterpiece of progressiveness and have a value of belonging there naturally. By analysing the natural context, the true-self of the design becomes exposed. Perhaps a heavier concrete structure as proposed seems sufficient when analysing the hefty rocks on site. The honesty of the site needs to be exposed and the process needs to be embraced. Refer to Figure 164.



(Author, 2020: online)

Figure 163: Connection to the site experience

Numerous reviewers, historians and critics have pointed out the style that Richard Neutra used to approach his designs. Neutra had an attraction to the well-being of humans and their happiness. He always placed emphasis on the relationship of his designs to the site's contours and elements. The proposed design appoints nature as a client. Thus, listening and analysing the fynbos, geomorphology, and contours on site, and paying attention to how the landscape was formed and how it functions. Refer to Figure 164 and page 38 - 41.

He was one of the first architects to regularly and comprehensively think about the intimate relationship of the biological and behavioural sciences to architectural and planning issues, which had a lasting consequence (Marlin, 1989: xxii). The scientist,



Figure 164: Site informing the design process

René Dubos stated that he created a 'science of living man'. He went beyond the aesthetics to create spaces that 'escape the shackles of reductionism' (Marlin, 1989: xxii). Neutra described biorealism as the realism that is most practical, it takes the body and the soul into consideration. He saw that the reality of the building was indeed the space within, just like his friend Frank Lloyd Wright said all along. He emphasised that the reality he was talking about, was the space within us, our feelings towards nature and our ethics, and not necessarily the space within our buildings (Marlin, 1989: xxiii). This is a very compelling proposition, not only psychologically but in terms of its formal applications as well.

Neutra desired gentler structures for human life.

The human well-being relies on the natural environment. When one sits and stares out into a vast landscape you feel wholesome. Neutra stated that, "Our organic well-being is dependent on a wholesome, salubrious environment (Marlin, 1989:1)." It must then be essential for us as human beings to be content with nature and live with it harmoniously.

The proposed design has a restaurant that folds open to the landscape, with its organic walls, low enough to overlook the landscape but high enough to feel safe and not be too exposed. This results in a visual connection to the site whilst being content with nature.

Neutra also believes that our environment is the connection and that we have neglected it badly. He mentioned that even though conservation of the wilderness and wild-life environment has been taken into consideration, no one has considered to better the architecture (Marlin, 1989: 3). However, today there are considerable examples that have improved the architecture, for example, the precedents that are analysed in this document, but there are still not enough. It could be argued that our daily environments are irritating and disorientating, drowning us in a chaotic presence.

Marlin states that our health is tied to cycles and rhythmic fields of force in nature (Marlin, 1989: 4). Refer to Figure 165. The sickness of the human being is connected to environmental causes, especially





Figure 165: Cycles and rhythmic fields of force in (Author, 2020), inspired by: (dailyartjournal.tumblr.com, 2020: online)

when we become disconnected to the environment. Marlin claims that we enclose ourselves in materials, technologies and machinery as well as structural settings that are destructive (Marlin, 1989: 4). This can refer to an architect's designs that do not take the environment into consideration and just pose an 'artificial being' in the land. Structures emit emissions into the atmospheres that are harmful to human well-being as well as the natural environment. Natural environments are exhausted for space and resources whilst harmful fumes are emitted into the air. Therefore, it is essential as a designer to design responsibly taking the human being, as well as the environment into consideration. Refer to Figure 166.

This ties in with the exhaustion of fynbos and cedar trees. We have the most extraordinary vegetation in our midst and despite trying to protect it, it is still endangered. Therefore, it is crucial to inform the visitors of the Cederberg that do love nature to be considerate of the landscape and to understand it in order to protect it.

A synthesis of our physiological, sensory, psychological and spiritual qualities comprise our character, which evolved over millions of years, just like nature's earthbound, geologic, gravitational and biosphere circumstances have evolved.

Architects and designers working in the environment should carefully consider this historic evolution of being and earth/environment. Depending on how sensitively we manage the environment's balance or capacity of resources, we can either erode or strengthen our sanity and civility. These aspects are as crucial to our survival as human beings as clean water and air. Our environment is the thing that ties us together. We share it, and therefore we need to protect it.

The architect, Peter Zumthor, discussed seven personal observations on presence in a lecture he gave at the Tel Aviv University, of which only a few will be discussed in the following section.



(Author, 2020), inspired by:  
(tate.org.uk, 2020: online)

Figure 166: Taking the human being and the environment into consideration

### Peter Zumthor:

Zumthor was wondering whether architecture has the ability to create presence.

Whilst overlooking a landscape, not thinking about the history of the site nor the future, just being in the moment on that specific place, is the presence of the site.

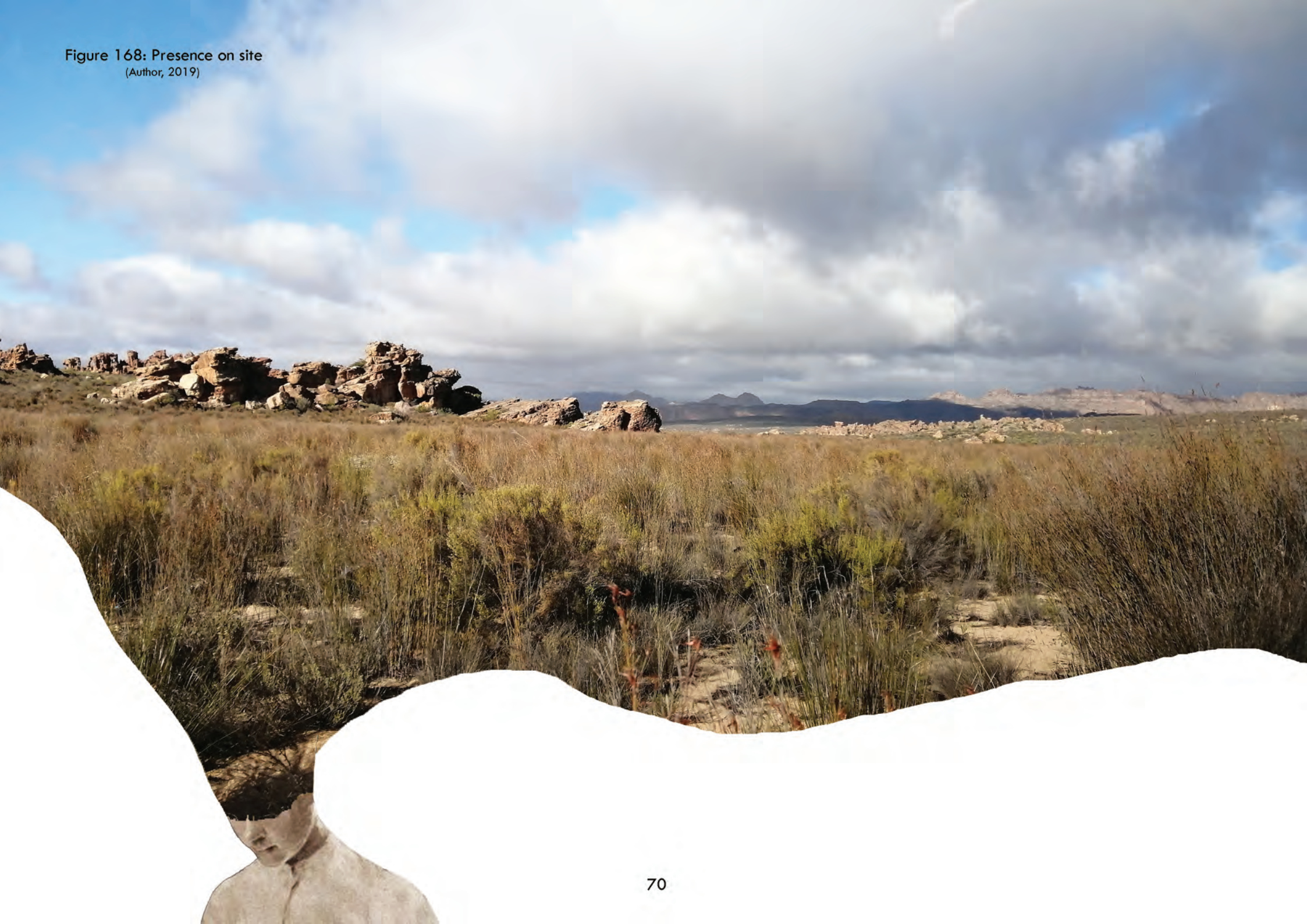
He mentioned that he read a novel written by an Austrian writer, Adalbert Stifter. The name of the piece is 'Like a tree'. It begins by explaining the branches, trees, the landscape, the river and it goes on for pages and pages (Tel Aviv University, 2013: video). By reading this you can feel the space even though no human being is in the space, there is no action. Only the presence of the space that you can feel and hear. Refer to Figure 167. Zumthor then asks the question, "if this writer could create presence by writing his piece, could the architects perhaps do it as well?"

Zumthor suggests that one should look at a landscape like looking at a tree. A tree does not try to sell you anything or tell you anything. It is beautiful and has numerous abilities and functions. Considering this aspect, I see my site. It is a natural landscape with geomorphological caves that are formed over hundreds of years by means of erosion, Fynbos covering the bulges and sunsets disappearing into the distance, leaving its orange glow on the caves. Refer to Figure 168.



Figure 167: 'Like a tree' visualisation

Figure 168: Presence on site  
(Author, 2019)



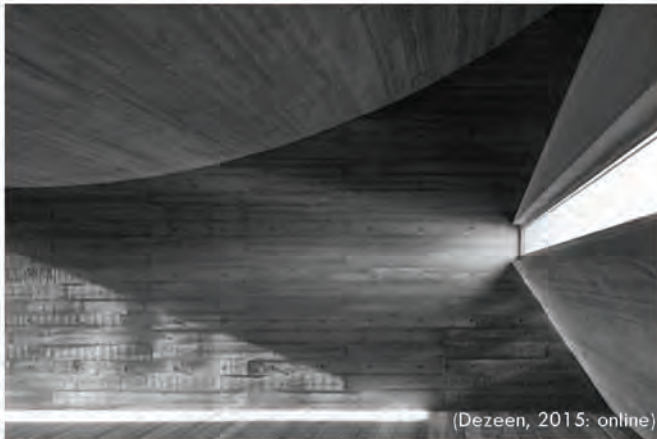


Figure 170: Experience in space, openings vs volume



Figure 171: Experience in space with regard to material and volume

The meaning of the proposed design is derived from the fire in fynbos and the geomorphology on site, which both relate to temporality. Temporal aspects can be evolved by introducing materials such as Corten steel or timber and the morphology of the building. Focussing on how the design will relate to its context.

Zumthor's second attempt at creating presence in architecture was to focus on the use. "Make it simple then it will become special" (Tel Aviv University, 2013: video). He firmly believes that an architect designs for the purpose of the building. He claims that it is a noble task for an architect to create architecture that is well used. It would be a pity to have a beautiful piece of architecture that is difficult to use.

Therefore, the function is key; each part of the building should be well suited to its use and it should be simple; not complicated. "Don't be special, be typical" (Tel Aviv University, 2013: video). Zumthor stated that, "If the building becomes really typical, it can become special."

The third attempt to create presence in architecture is that form follows anything, or the body of architecture. Zumthor claims that the material creates a building's atmosphere, not so much the form. When some materials are placed together, a reaction can occur, whether it is chemical or aesthetic – even physical. He said that by changing the quantity of materials, an atmosphere can be created in architecture.

I must disagree to some extent with this statement. I believe that form can create an atmosphere. This is evident when visiting a cave. If the cave would have only been square, with no character, it would not have had the presence of a cave. Perhaps it is because we only know a cave by what we have experienced it to be. However, I do believe that the form of spaces can have an impact on the presence thereof, especially if volume is regarded. High ceilings and

large openings in the wall have a different experience to small openings that only let a small amount of light into a space. Perhaps the presence in architecture can be created by the material choice and the amount thereof, whilst considering the scale of a space. Refer to Figure 170 and 171.

Zumthor's fourth attempt is the house without a form. He describes the small Bruder Klaus field chapel that he designed for a saint. Refer to Figure 174. The interior is made up of concrete imprinted burnt tree trunks. The space still has a fire scent to it, whilst it is open to the sky so the rain can fall inside. It is an emotional space that stays with you. A space should disappear in its usefulness by becoming an emotional space.

It is important to stay true to the site, as stated by Richard Neutra. Each site has a unique emotional experience and so does the Cederberg. It is rich in history, rock art paintings at the elephant cave that tell a story of the past, the names of historical icons that are engraved in the stadsaal cave, fynbos has been growing there for hundreds of years and the geomorphological sites have been created over thousands of years.

Fire and Fynbos is one of the unique true to site experiences. Refer to Figure 172 and 173. Perhaps a space that consists of concrete imprinted tree trunks from another tree that is burned can be used to embrace the memory of the Cedar tree that is on the verge of extinction.

When stepping inside a building, what is the first impression? How is the atmosphere and does it get to you? Does the building remain with you? The design should touch memory and feeling. That is how a presence can be created.

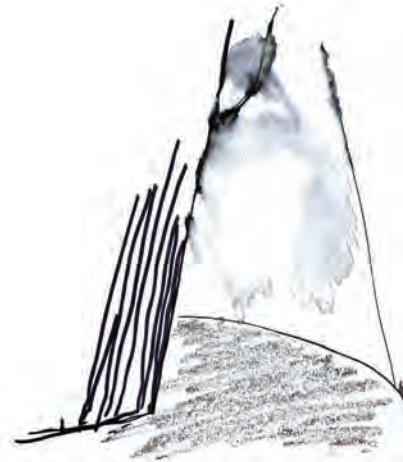


Figure 172: Fire and Fynbos created into a space  
(Author, 2020)



Figure 173: Fire and Fynbos  
(Author, 2020)



(Amazonaws.com, 2020: online)

Figure 174: Bruder Klaus field Chapel

Zumthor describes presence as the following:

“You’re in the world

And you’re part of the world in a moment

There’s something bigger in the world than you are”

(Tel Aviv University, 2013: video).

In an interview between Peter Zumthor and Juhani Pallasma, Zumthor asks Pallasma a series of questions of the first spaces he remembers in his life, or the best spaces he perceived in his life. Zumthor concludes that all of us come from spaces. How we perceive space and what types of spaces we grow up in will influence us until the day we die.

This is the reason why each person perceives architecture differently. They react towards a space through their own experiences. He says that the experience is a mental thing, it is your mind and your memories, and it is your expectations (Aalto University, 2018: video). It is between the object and the human being. Refer to Figure 157 on page 60. Nature is the one space every human being can relate to and it is, therefore, important to protect it and to celebrate it.

Pallasma does not believe that a building could have a presence if no one were to look at it. He believes that the presence is within a human being. (Aalto University, 2018: video). There is a dialogue between the observer and the work. The dialogue needs two participants, one alive and one dead. The human being cannot sense presence without the work and the work has no presence without the human being. Refer to Figure 175.

This is very interesting to think about and it might be true but one will never know; as for human beings, it makes sense to understand that the presence is within us, but it is also the only way that human beings could understand it because we experience it that way.

Both concluded that presence has an historical depth to it and that we should imagine human situations rather than architecture as pre-given while we design (Aalto University, 2018: video). This will enable the architect with a better set of skills to approach the design process successfully.

By combining human activity and natural influences, a presence can be created in architecture. We all perceive art and architecture in different ways due to our experiences and the spaces in which we grew up. It is about what is within and we all have an instinct of contentment towards nature. The piece of architecture is merely there to be interpreted or to be experienced by the visitor.

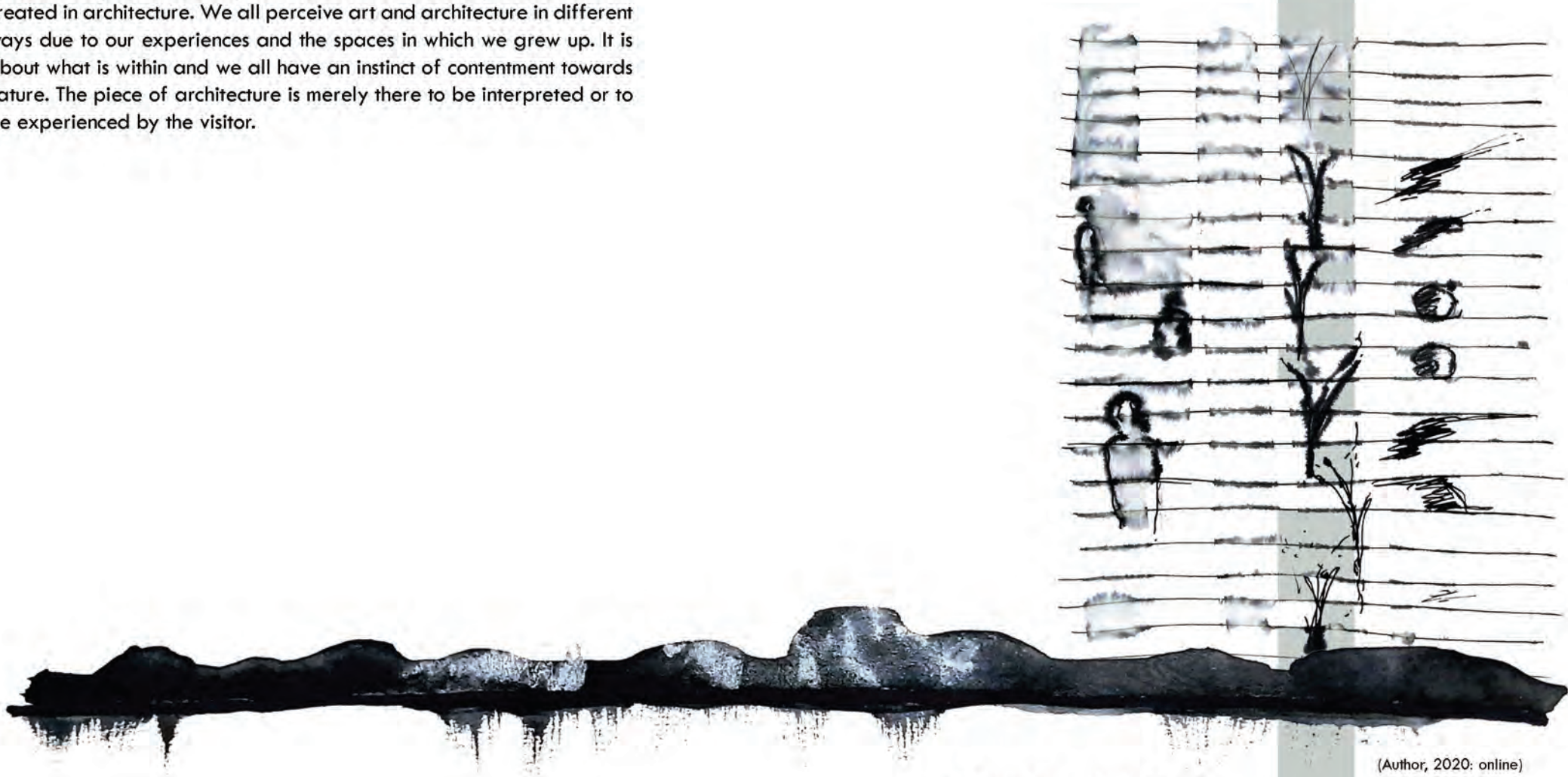


Figure 175: Dialogue on site

(Author, 2020: online)



## Part two: Exploration and grounding

### Precedent studies

- 77 Mapungubwe Interpretation Centre
- 81 Oudebosch Camp
- 85 VanDusen Botanical Garden Visitor's Centre (construction)
- 93 Olympic Archery Range

### 95 Design development

#### Design synthesis

- 130 Location
- 130 Climate
- 131 Form and function
- 140 Services
  - 140 Electricity
  - 140 Hot water
  - 142 Water
  - 143 Fire
  - 143 Ventilation
- 144 Circulation
  - 144 Universal access
  - 144 Vehicular
  - 145 Pedestrian
- 147 Structure

The site has been analysed and the architectural theories has been discussed; now, the precedents will be analysed. Refer to Figure 176.

**Theoretical approach to design:**

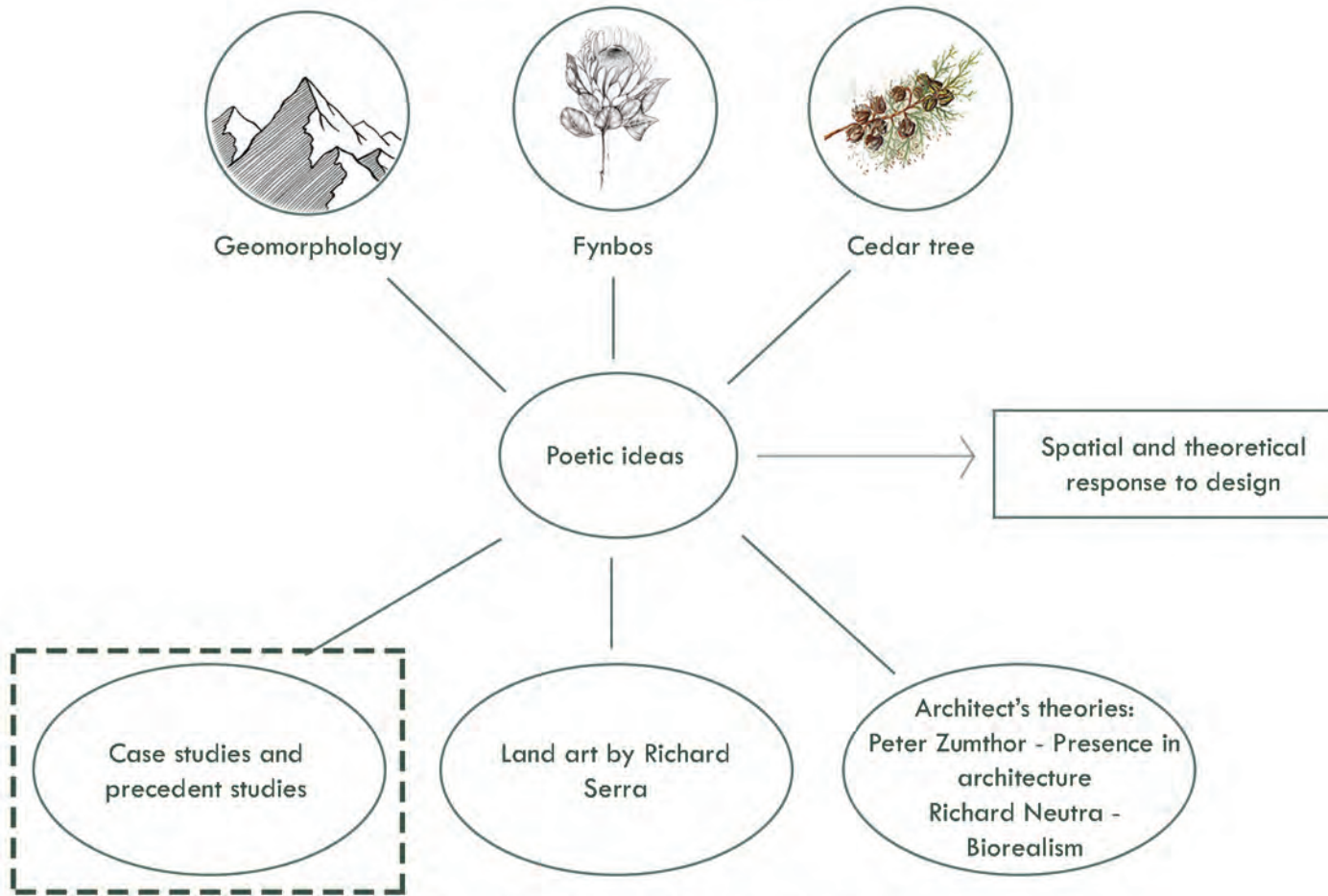


Figure 176: Theoretical underpinning  
(Author, 2020)

## Mapungubwe Interpretation Centre

**Architect:** Peter Rich Architects  
**Location:** Limpopo, South Africa  
**Year:** 2009

The Mapungubwe interpretation centre is applicable to the design process by means of the function, morphology, circulation and environmental awareness.

### Function:

This centre consists of spaces to tell stories of the area, display artifacts, tourism facilities and SANpark offices (Archdaily, 2010: online). Refer to Figure 179 and 184 - 186. These spaces inform the visitor of the area's history to understand the vulnerability of the local ecology, such as the proposed scheme.

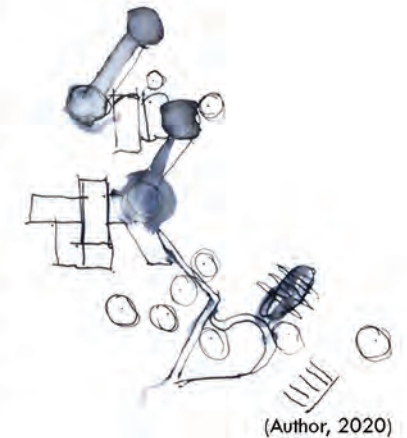
### Morphology:

Approaching the interpretation centre, one will notice the edges of the arches that are exposed and the vaults that seem as if they want to swell from the earth (Peter Rich Architects, 2009: online). Refer to Figure 180 and 181.

Inspiration was taken from the approach the architect took towards the morphology and material use that was influenced from the surrounding rocky context.

The process led to numerous inspiring structures in the landscape that are rooted to their location (Peter Rich Architects, 2009: online). Dramatic cave-like spaces are created in the landscape by means of constructing timber vaults. Refer to Figure 177. The timber vaulting emphasizes the natural forces as well as the materials in the landscape.

The proposed design took a similar approach towards the design process. As mentioned before, the Stadsaal Caves play a crucial role in the development of the floor plan. Thus, suggesting that the floor plan is derived from the surrounding context, emphasizing the layers of history. These layers of history are also illustrated in the palimpsest concept on page 44.



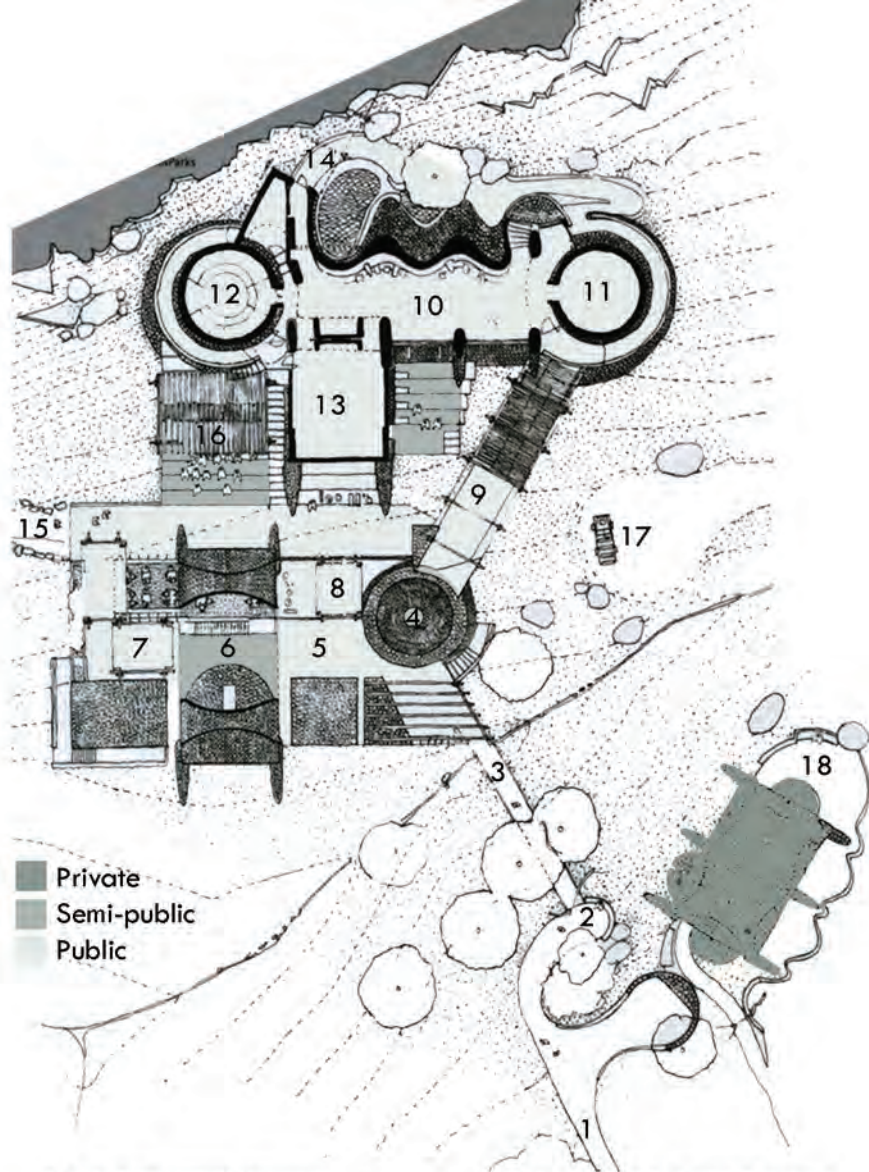
(Author, 2020)

Figure 178: Zigzag through spaces



Figure 177: Mapungubwe Interpretation Centre

(Archdaily, 2010: online)



- |                                 |                                   |
|---------------------------------|-----------------------------------|
| 1. Pedestrian arrival/departure | 10. Main vaulted exhibition space |
| 2. Arrival landing              | 11. East cairn                    |
| 3. Bridge                       | 12. West cairn                    |
| 4. Reception                    | 13. Teaching and learning         |
| 5. Outdoor court                | 14. Mesa walkway access           |
| 6. WC's                         | 15. Return route                  |
| 7. Restaurant                   | 16. External teaching             |
| 8. Craft shop                   | 17. Game-drive drop-off           |
| 9. Floating walkway             | 18. Southern Park headquarters    |

Figure 179: Floor Plan of Mapungubwe Interpretation Centre  
(Author, 2020)



Figure 180: Vaults swelling from the landscape  
(Author, 2020)



Figure 181: Vaults swelling in section, fitting into the landscape  
(Author, 2020)



Figure 182: Experiences through design  
(Author, 2020)

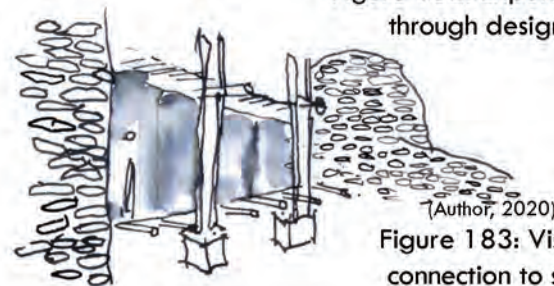


Figure 183: Visual connection to site  
(Author, 2020)

## Circulation

One will follow a delicate route that zigzags through the exhibition spaces, slowly moving up towards the highest point of the site. Refer to Figure 178. The visitor is presented with a narrative of different cultures that crossed the land whilst enjoying beautiful views and experiences throughout the journey. Refer to Figure 182, 183 and 186.

The proposed design will make use of numerous circulation routes that were derived from the surrounding context. Refer to Figure 188. These routes will lead through the interpretation space, the restaurant or towards the Stadsaal cave that is the most prominent aspect of the proposed site. Along the way, glimpses of the landscape will be framed to ensure that a constant dialogue between the visitor and the site is formed. Refer to Figure 191 and 193.



Figure 184: Shaded space



Figure 185: Spaces inside the interpretation centre



Figure 186: Spaces inside the interpretation centre

## Environment

Passive design elements were incorporated in the design. Shading structures are built from timber that is slatted horizontally over the classroom spaces. Refer to Figure 184. Ponds are placed in front of some 'windows' to cool the air that naturally ventilates through the spaces. Refer to Figure 187. Filtered light through fused coloured glass lit spaces with spotted patterns, reflecting from the water ponds. Refer to Figure 189 and 190. The southern light quality is also controlled by rusted steel screens that are shaped vertically as if they could be branches of indigenous trees located on site (Naidoo, 2009: online). Refer to Figure 185.



Figure 187: Ponds in front of windows



Figure 188: Stadsaal cave posing different routes to take

Even though the proposed design is filled in with glass to allow a constant visual connection to the site, shading devices still need to be considered to prevent overheating, especially in the Cederberg. Therefore, carefully designed shading devices will be attached to the west façade. Refer to Figure 192.

The roofs will touch one another lightly with a glass infill between them, which will allow natural light to enter the spaces, and allow natural ventilation.

This precedent is applicable to my design as it is an interpretation centre that is located in South Africa. The dialogue that the structure has with the site in terms of experienced views can be taken into consideration, as well as ideas that have been evoked to not only design an interpretation centre, but a piece of architecture that becomes part of the landscape's narrative.

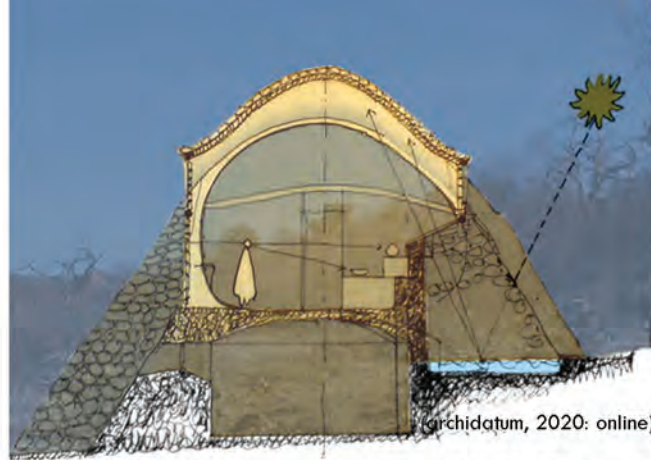


Figure 189: Diagram showing sun reflection in pond (archidatum, 2020: online)

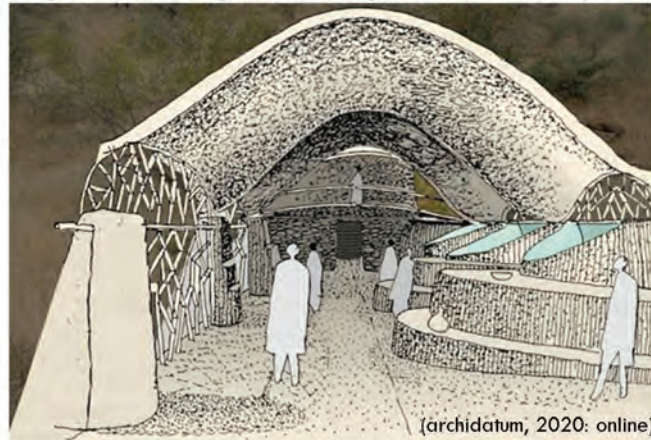


Figure 190: Artifact exhibition space (archidatum, 2020: online)



Figure 191: Stadsaal cave framing the landscape (Author, 2020)

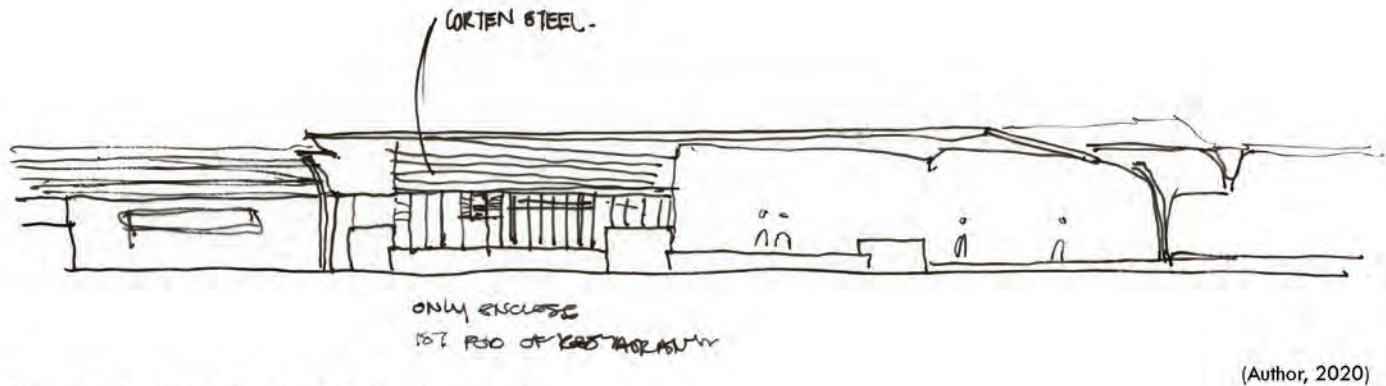


Figure 192: Proposed screen of west facade (Author, 2020)

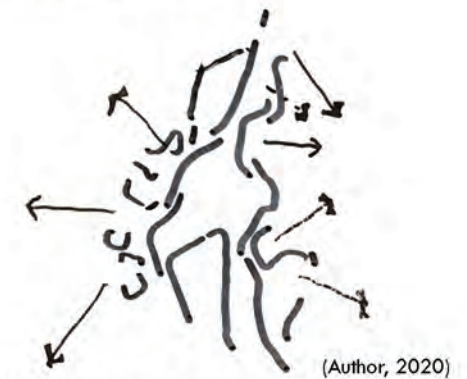


Figure 193: Proposed design framing views of the landscape (Author, 2020)

## Oudebosch Camp

**Architect:** Architecture CO-OP

**Location:** Kogelberg Nature Reserve, Western Cape, South Africa

**Year:** 2012

Emphasis will be placed on the environmental impact, the function and the construction of this precedent.

This self-catering accommodation is situated on a world heritage site in a nature reserve in the Western Cape, such as the proposed site. Refer to Figure 194 - 198. This area is home to nearly 1800 fynbos plant species and numerous animals, thus being named, the heart of the fynbos.

This precedent inspired the proposed design's unique naming. The accommodation units were named after fynbos species such as the erica, iris and marsh rose etc. The proposed design will make use of unique Afrikaans Fynbos names such as the 'speldekussing', 'aasbossie', 'goudsboom', 'rooistompie' and 'geelmagriet' for naming the restaurant and the accommodation units. The reason being, that the Dutch were the first to ever write about the Cederberg and the Dutch language developed into Afrikaans over time. It has been noticed that Afrikaans is also the most spoken language in the Cederberg (Weller, 2017: online). The design process of the Oudebosch camp started by carefully mapping the site in detail such as the vegetation, water, geology, microclimate, natural landscape, etc. (Young-Pugh, 2012: 23). This relates to the approach of the proposed design by analysing the geology, fynbos and cedar tree.



Figure 194: Oudebosch Camp

(Apsidal, 2020: online)



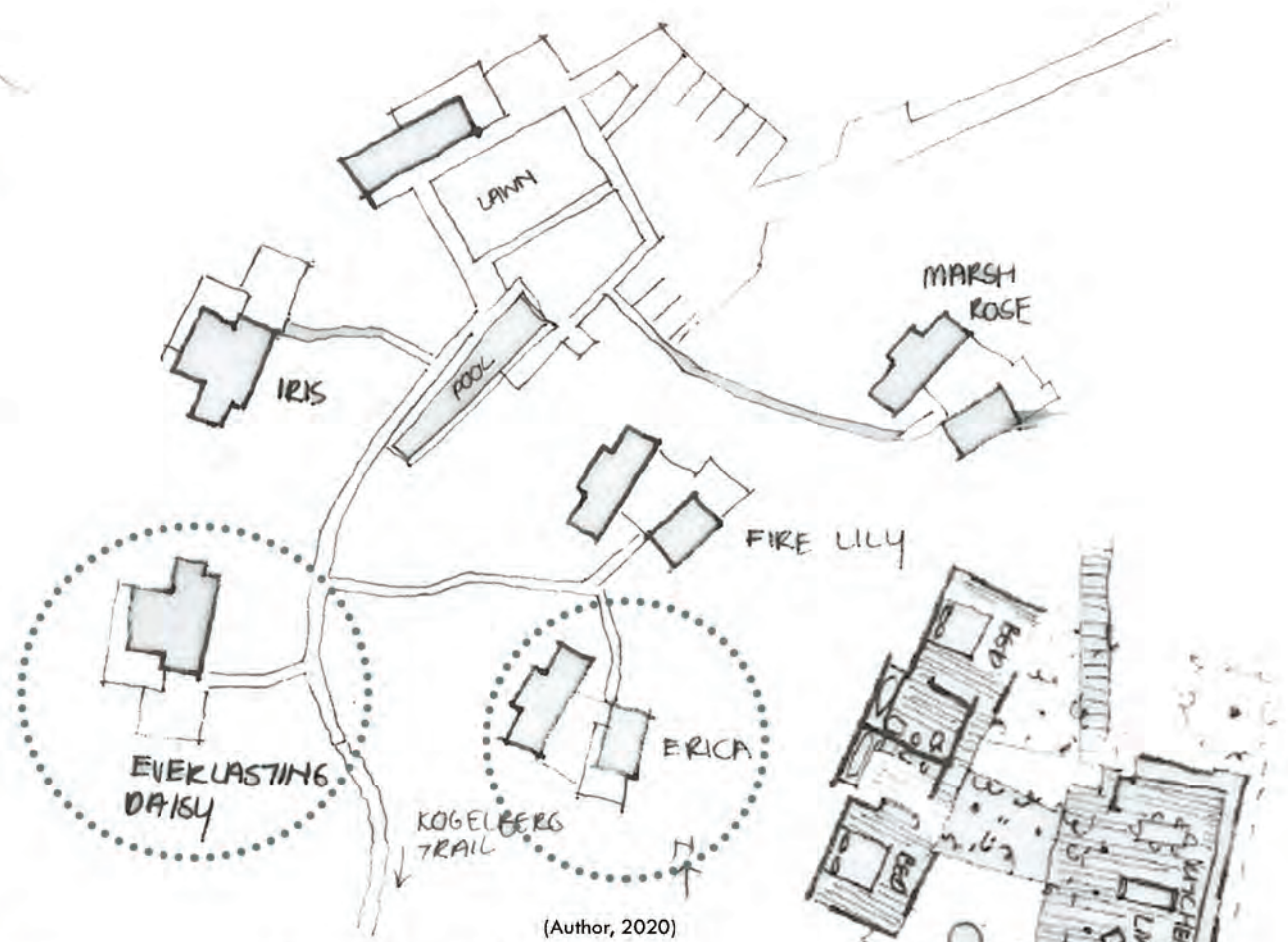
(Author, 2020)

Figure 195: Self-catering cottage



(Author, 2020)

Figure 196: Everlasting Daisy Floor Plan



(Author, 2020)

Figure 197: Site Plan



(Author, 2020)

Figure 198: Erica Floor Plan

## Environment

### Water

To adapt to the climatic conditions of the Western Cape, passive design principles were used.

A critical aspect to the precedent was the supply and treatment of the wastewater and stormwater on site. The swimming pool is an ecological pool, using the natural stream's water on site. Water is purified by a riparian wetland plant that was built on site. Refer to Figure 208.

As the proposed site is situated in a nature reserve, great care had to be taken to deal with wastewater on site. The proposed design will make use of Kyasols' wastewater and rainwater solutions.

### Electricity

Solar water heating, closed combustion heating, CFL and LED lighting are used to minimise energy usage at the Oudebosch camp (Young-Pugh, 2012: 26). The proposed design will make use of solar panels for electricity as well as gas in the kitchen. As the design process lead to a roof that does not face North, a decision was made to design a solar farm behind the rocky stones that hides them visually. Refer to Figure 345, page 141.

An extensive landscape restoration programme was applied to the site by allowing less cars and roads on the site similar to the proposed design. Succulents and sedges are planted on the roofs to reduce the visual impact of the structure in the landscape. A planted roof was decided against as the Cederberg has such extreme climate conditions. However, the proposed design reduces its visual impact by borrowing from nature's geomorphology to camouflage.



Figure 199: Elevation, touching the earth lightly

(Author, 2020)

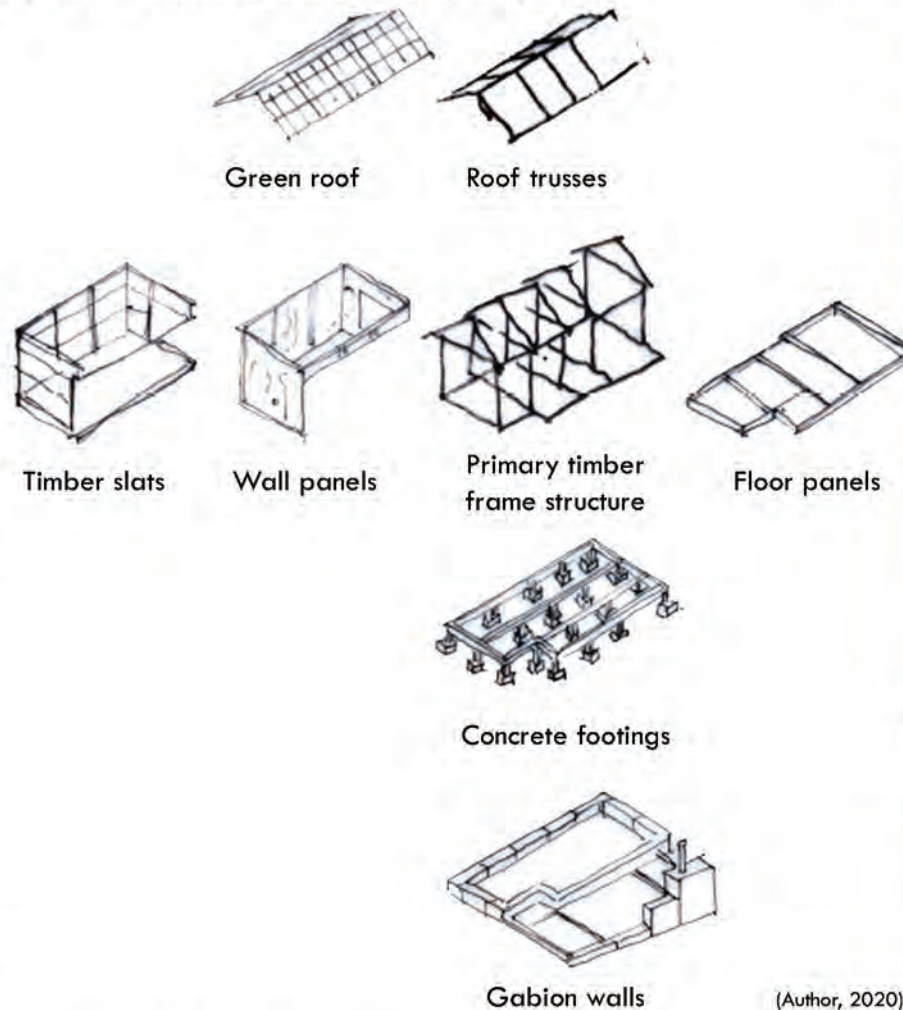


Figure 200: Structural diagrams

(Author, 2020)



Figure 201: Dining space

(Visi, 2012: online)



Figure 202: Entertaining

(Visi, 2012: online)



Figure 203: Living space

(Visi, 2012: online)



Figure 204: Bedroom

(Visi, 2012: online)



Figure 205: Bathroom

(Visi, 2012: online)

## Construction

The construction was analysed in terms of how this precedent dealt with fire prevention.

The structures consist of a simple material palette of timber and gabion walls done with low-tech systems. Refer to Figure 199 - 209. The gabion walls link to the surrounding mountains, I am not sure if this is the best illustration of 'touching the earth lightly'. However, the article did mention that this was done to create a plinth for fire prevention purposes (Young-Pugh, 2012: 25). They also mention that fynbos does not flourish underneath the structure, which was one of my thoughts to the proposed design as well. Thus, there is no use in lifting the structure off the ground in terms of not damaging the vegetation and it aids in fire prevention.

Analysing the site and researching the requirements for fire breaks reveals that the site is perfectly located to be protected from fires. This makes sense as no information on a disastrous fire at the Stadsaal caves could be found.

This precedent is a critical design informant as it dealt with the same climatic and site-specific conditions as the proposed design.

Overall, the scheme approach of arriving at a main building, accommodation following and then a walking trail continuing from the site is relevant to the proposed design.



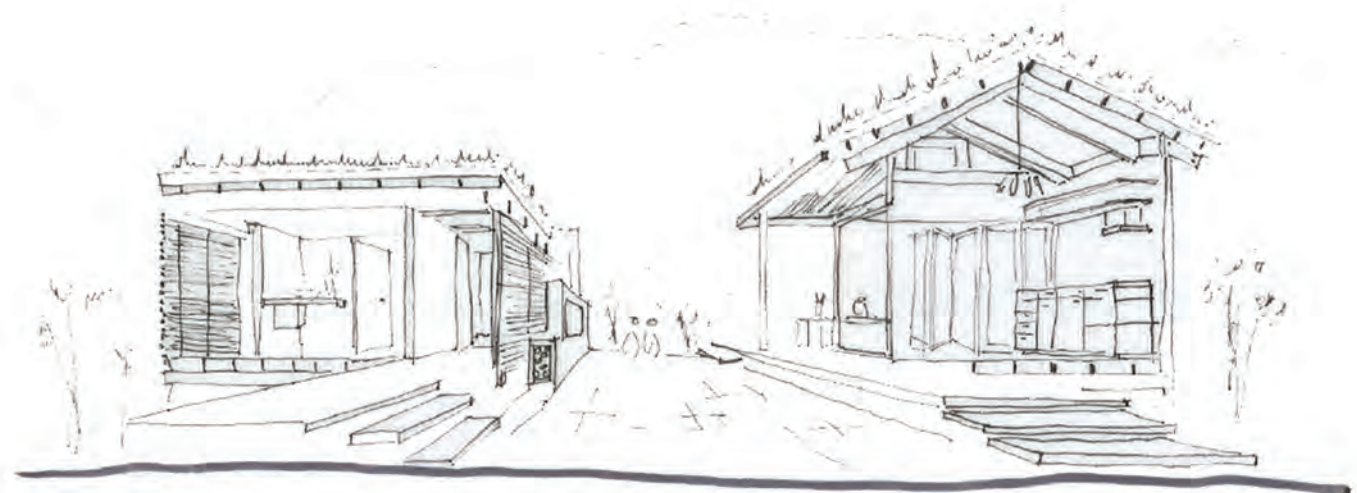
Figure 206: Cabin in the landscape



Figure 207: Cabin in the landscape



Figure 208: Swimming pool



(Author, 2020)

Figure 209: Perspective section

## VanDusen Botanical Garden Visitor Centre

**Architects:** Perkins + Will

**Location:** Vancouver, British Columbia

**Year:** 2011

The VanDusen Botanical Gardens Visitor centre incorporates the goals of environmental and social conscious design (Vinnitskaya, 2012: online). Refer to Figure 210 and 214. An important aspect of this design is that consists of numerous passive and active systems. These systems make use of the site's renewable resources as well as the building's own waste (Vinnitskaya, 2012: online).

Therefore, this precedent is applicable to the proposed design by means of its function, structural approach and material use.



Figure 210: The VanDusen Botanical Garden Visitor Centre

(Perkins&Will, 2011: online)

## Structure

The roof structure was inspired by an orchid, it forms a landscape of smooth waves that mimic the orchid leaves. Refer to Figure 215, 218 and 219. These orchid 'petals' float above rammed earth and concrete walls, finding the perfect balance between architecture and landscape. Refer to Figure 219. The concrete and rammed earth walls are not load bearing, although some steel posts are inserted in the walls to hold up the roof while glazing encloses the spaces.

The proposed design took a similar approach by taking inspiration from the site's geomorphology. A concrete gutter that poses as a structural beam will be supported by concrete columns that sit on pad foundations. A steel frame structure that is clad with a timber ceiling and copper roof sheeting will be attached to the gutter. The concrete gutter will imitate the geomorphological features as the bulge of the gutter insinuates the Stadsaal caves in all its beauty. The roof will be supported by its own concrete structural grid, covering the free-formed walls that run underneath, creating a metaphorical balance between landscape and roof. Refer to page 117 and Figure 331, page 126.

Even though the precedent made use of a timber-framed structure, the proposed design will make use of a concrete-framed structure. Refer to Figure 211 - 213 and 216, 217. Steel is used at times to carry the load of the roof as timber will have to be thicker to carry a heavier load and can become more costly. The timber is a clever material to have used for this design, as it is not only used for its structural properties but its aesthetic and acoustic abilities as well. Timber will absorb the sound instead of creating an echo together with the polished concrete floors. Refer to Figure 215.

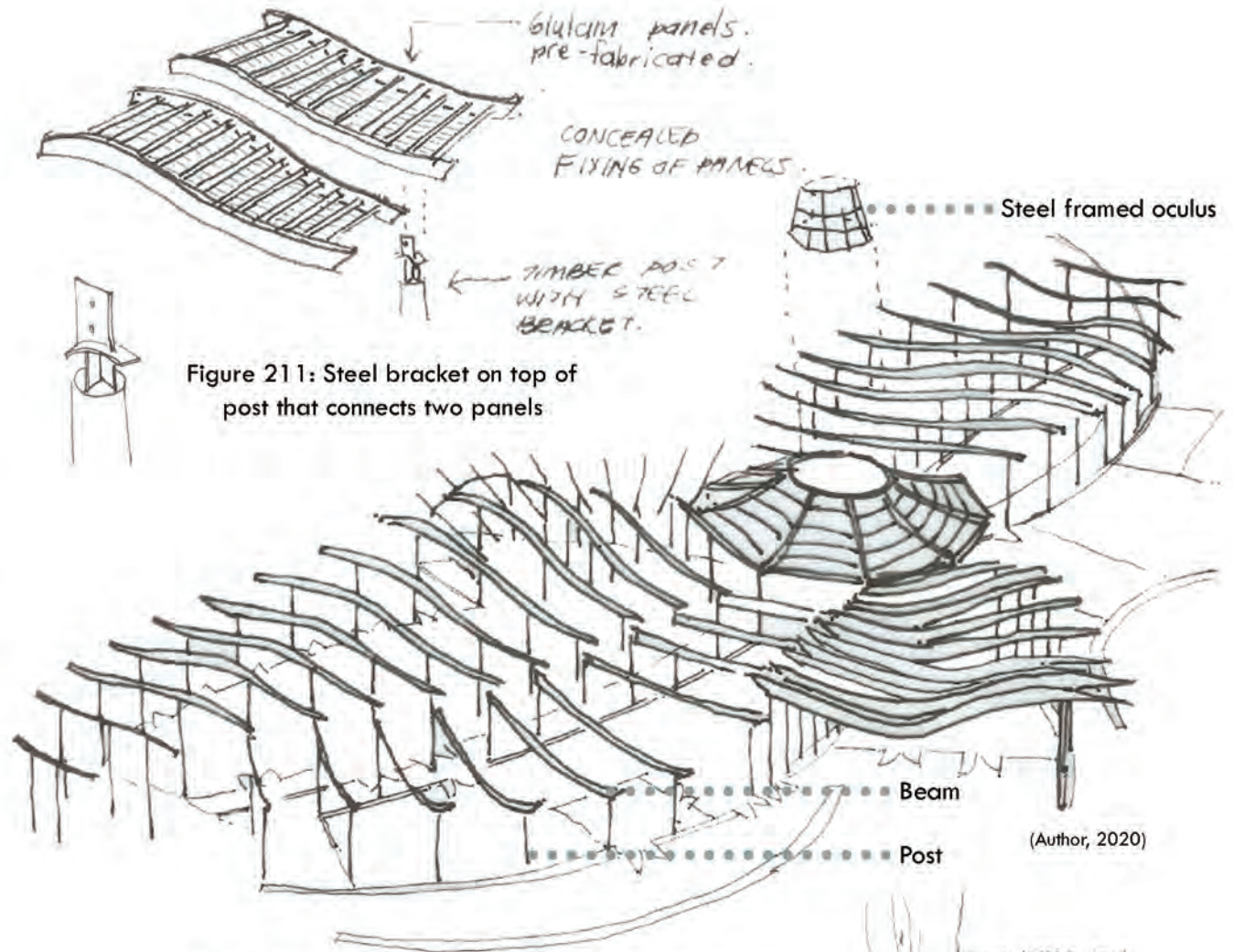


Figure 211: Steel bracket on top of post that connects two panels

Figure 212: Primary post-and-beam timber structure.

Figure 213: Timber post attached to steel bracket, attached to pile foundation

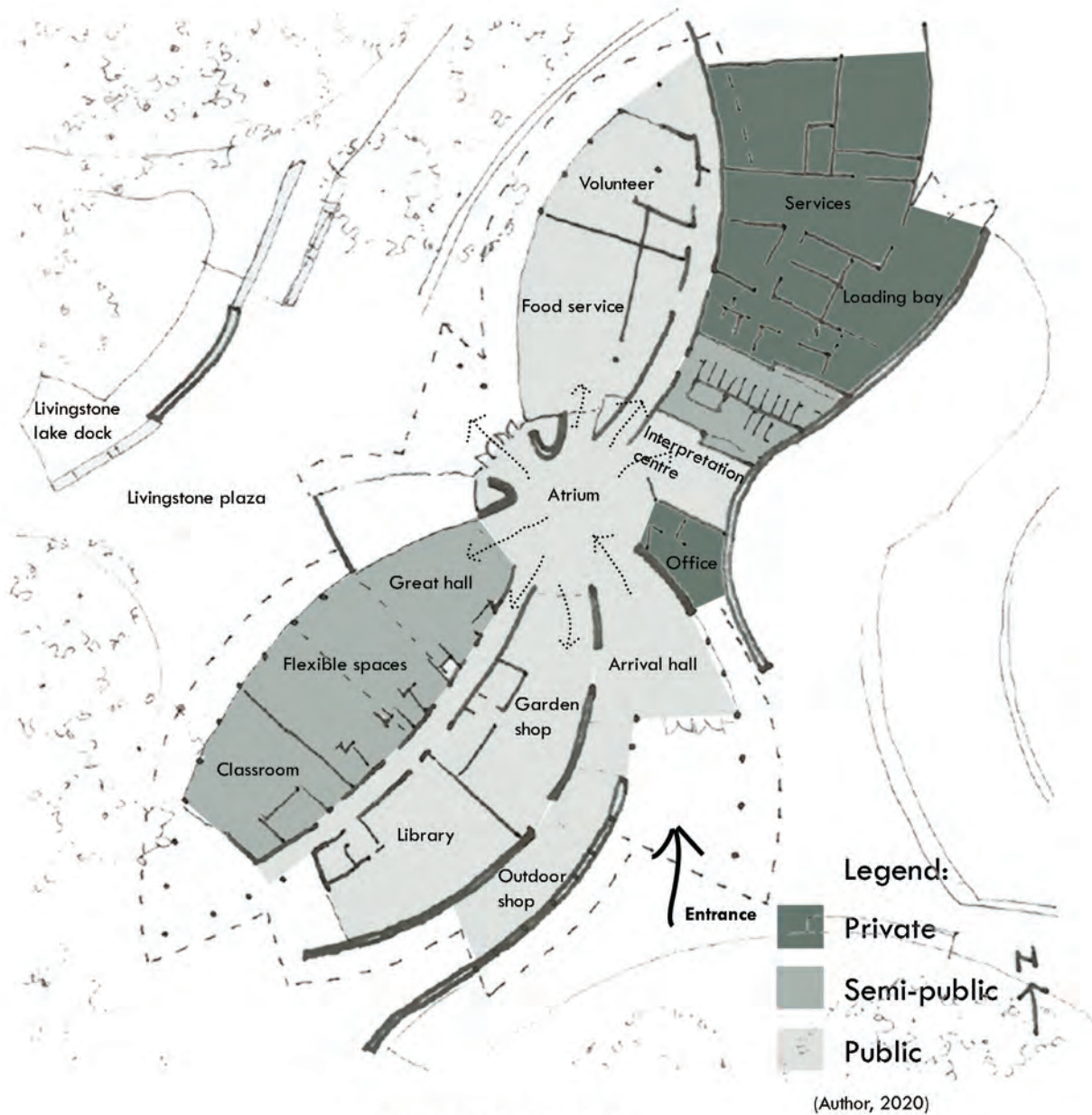
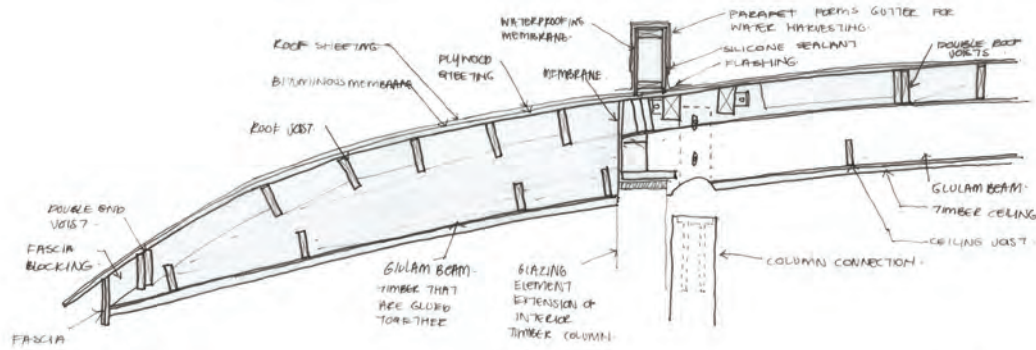


Figure 214: Floor Plan

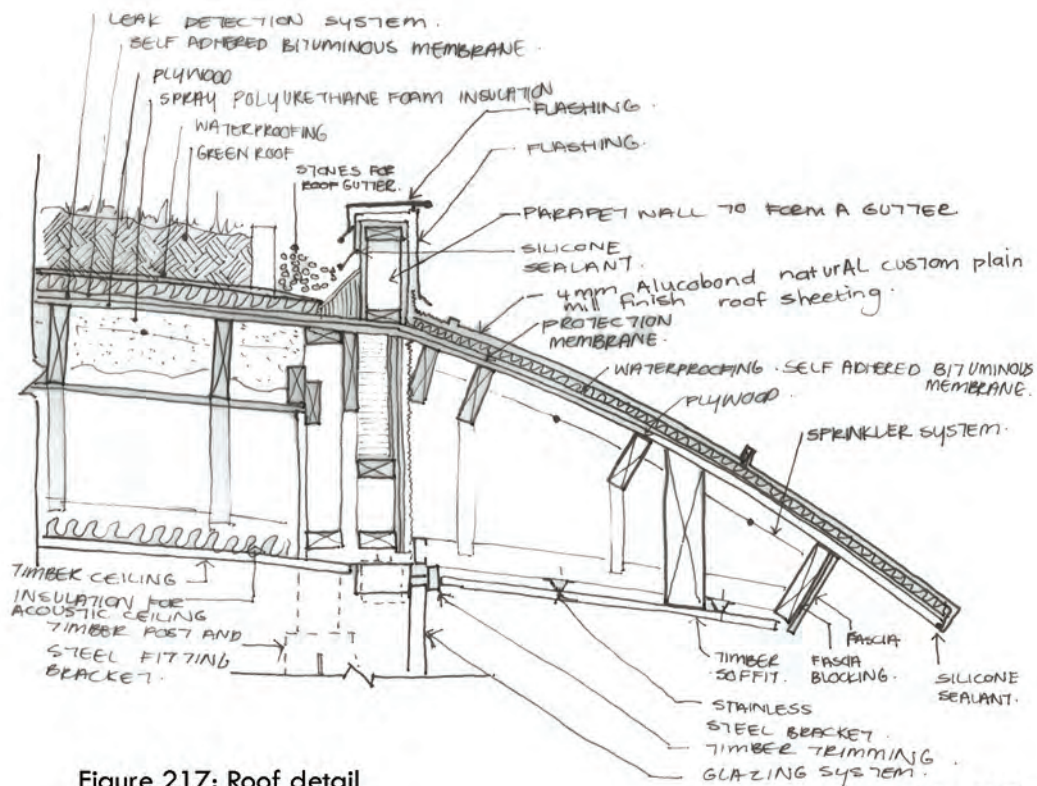


Figure 215: Great hall with timber ceiling



(Author, 2020)

Figure 216: Typical roof detail



(Author, 2020)

Figure 217: Roof detail



(Perkins&Will, 2011: online)

Figure 218: Roof structure

Regarding my theoretical approach, the sound properties are also crucial to the proposed design as the site is a very peaceful place and the presence of architecture by means of the structure should be the talking element. Thus, the choice of a timber ceiling to create warmth and to allow for some sound absorption.

## Materials

### Walls:

The precedent has a rise and fall of concrete and rammed earth walls, whereas the proposed design will make use of boarded concrete walls. Refer to Figure 220. These walls will have a horizontal wood grain imprint to encourage movement through the building with emphasised cladded Corten steel walls as well. Corten was selected for its ability to change over time and to enhance the memory on site.

### Floors:

Polished concrete floors are used in the visitors' centre, they are durable and a healthier alternative than other flooring options that can release emissions into the air. The material finishes are limited and most of them are natural. Therefore, I made the decision to also make use of polished concrete floors, as it will be the easiest to clean. Polished concrete is also durable and requires very little maintenance.

However, the main route that starts from the parking lot and ends at the Stadsaal Caves will be made of timber. The different choice of material will emphasise the most important route and timber is also a more natural material to place in the landscape. Considering dangers, polished concrete can become slippery when wet, timber is more textured and safer to walk on when it rains, and this route is mostly exposed to the elements. The trail leading from the building will disappear into the landscape to create a feeling of truly being in the landscape when walking towards the Stadsaal Caves.

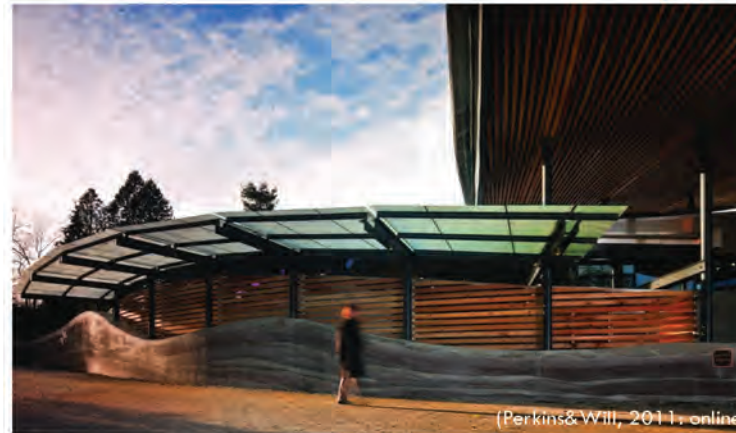
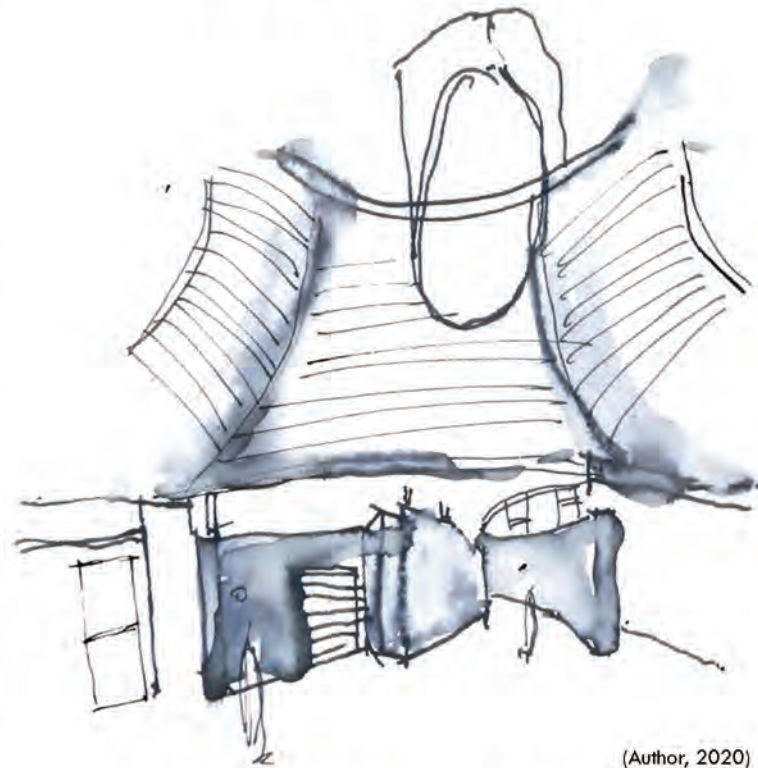


Figure 219: Steel structure penetrating the rammed earth wall at the outdoor shop



(Author, 2020)

Figure 220: Circulation led by walls and structure

## Roof:

The precedent has a specifically designed green roof to allow for vegetation to grow on. Refer to Figure 221. This is done to 'replace' the vegetation that the building footprint took up. Even though consideration was taken to apply the same approach to the proposed design, otherwise was chosen as the next precedent done by Miralles had a bigger influence on the design process. His building related better to the geomorphology, and the harsh climatic conditions in the Cederberg would not allow for vegetation to survive on the roof.

Therefore, the concrete gutter that acts as the beam has a steel-framed structure attached to it, clad with a timber ceiling for sound absorption as well as the natural feel that the timber allows the user to experience. Copper roof sheeting will clad the roof above. Again, the decision for using copper is because of its properties to age well over time. It was also a very difficult design process regarding the roof design, as consideration had to be taken for the fact that the roof will be seen from above when standing in the elephant cave and looking over the landscape.

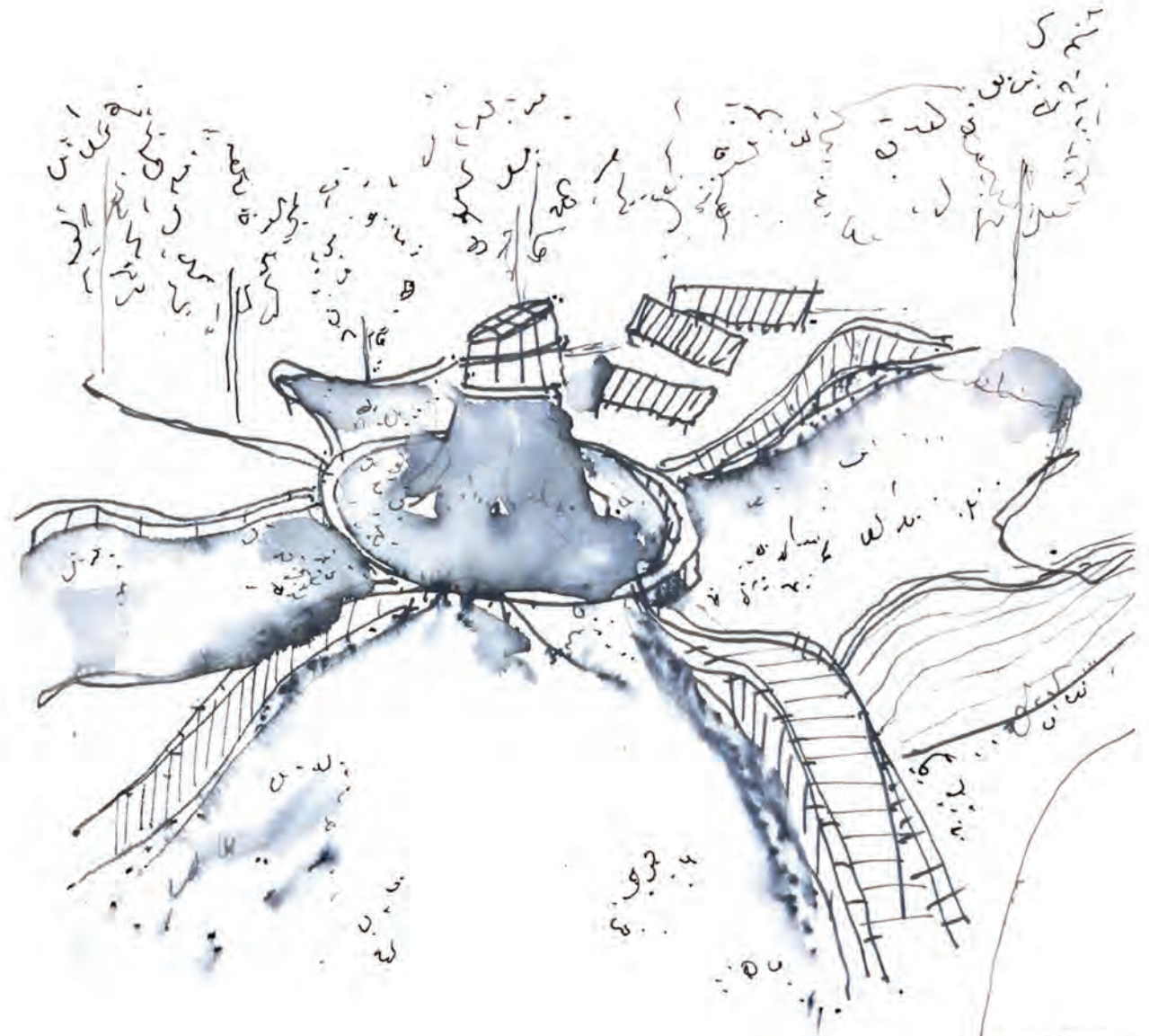


Figure 221: Waved green roof

(Author, 2020)

## Site accessibility

One can easily access the site by road from the urban environment, into a parking lot. One approaches the building by foot, crossing a timber bridge and is welcomed by the design celebrated entrance. Refer to Figure 222 - 224. The proposed design will have a similar entrance approach, moving through the natural rock beds by foot from the parking lot.

The precedent is also the gateway building to the botanical gardens, and the proposed design becomes the gateway building to the stadsaal caves.

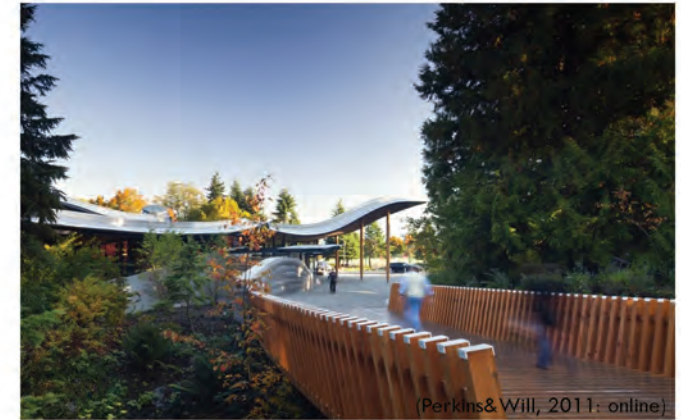


Figure 222: Timber bridge and celebrated entrance



Figure 223: Gateway building to the botanical gardens



Figure 224: Site Plan

### Spatial enhancement:

As mentioned before, the design is a series of spaces that rise and fall with a visual connection to the surrounding context. Refer to Figure 226. The interior spaces are filled with warm timber slats that emphasise the curves of the roof and create a calming warm feel inside the structure.

Large, glazed areas maximise the views and daylight that enter the building. Refer to Figure 226. 93% of the spaces in the building find daylight sufficient, which means that the electrical lights can be switched off during the day and 85% of the spaces have a view of the landscape. The visitor's centre makes use of renewable systems to create zero energy consumption. Refer to Figure 225.

As the proposed design does not have any access to municipal facilities, renewable systems also need to be incorporated such as the solar farm and the re-use of water on site.

The biorealism theoretical approach is inspired by this precedent. It takes the human experience and well-being into consideration throughout. It also poses ideas of how to create presence in architecture and I can use this to create the presence of the proposed site, in the Cederberg. Even though the organic formed roof worked for the precedent, the proposed design roof is believed to be more successful as it has a harsher approach to the roof form to relate to its context.

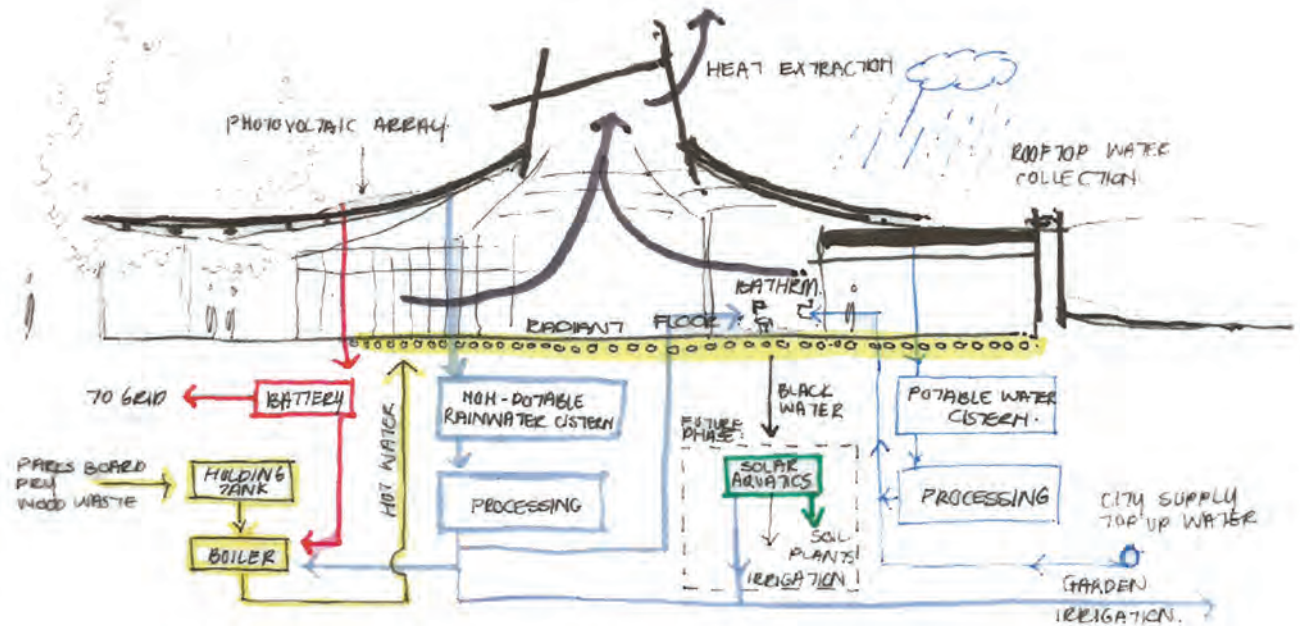
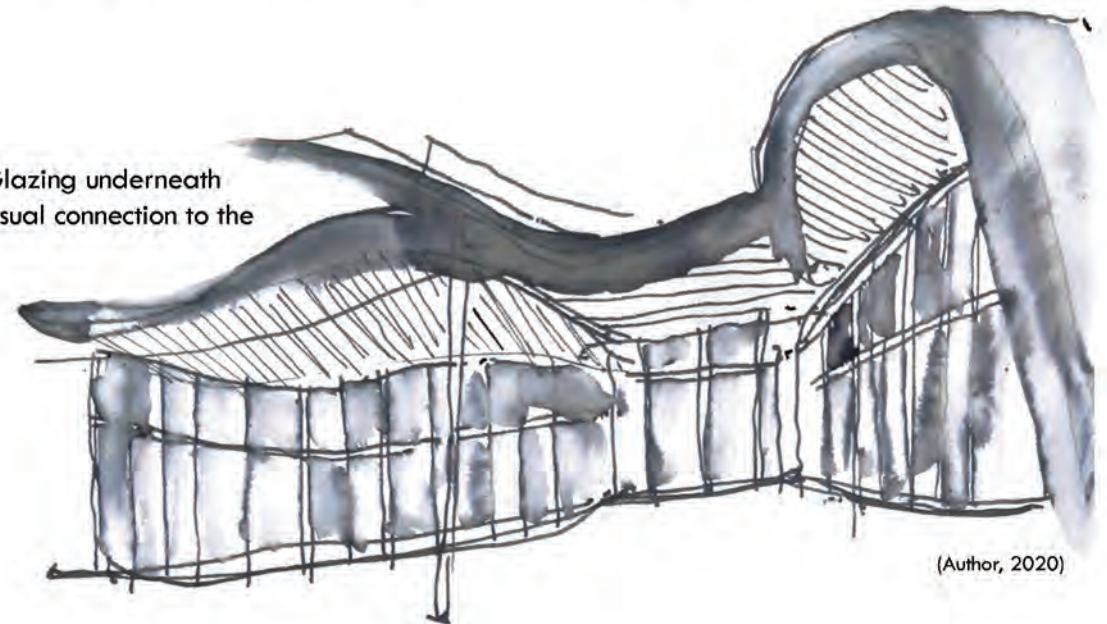


Figure 225: All renewable systems to create a zero energy consumption design

(Author, 2020)

Figure 226: Glazing underneath the roof for visual connection to the outside



(Author, 2020)

## Olympic Archery Range

**Architects:** Enric Miralles & Carme Pinos

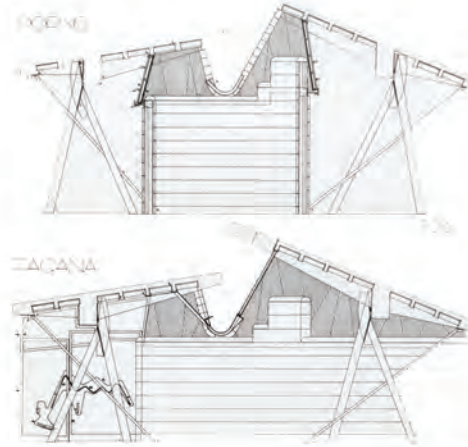
**Location:** Barcelona, Spain

**Year:** 1991

### Structure

The Archery pavilion is the most influential precedent with regards to the roof development. The proposed design had numerous roofs throughout the design process that were not successful as the site has a very specific language that needed to be communicated. The design process only seemed to go in the right direction once the Archery pavilion was carefully analysed.

The Archery pavilion relates to the construction conceptual approach of having free formed walls underneath a roof structure that supports itself. Refer to Figure 227 - 231. "The drawings show an overlay of organic curves and rectilinear shapes working in sublime harmony, producing a composition that clearly conveys both the architect's concept and the process through which it was developed (Langdon, 2020: online)." The layering of the heavy concrete structures were quite the challenge from which to learn but not copy, as one can see that some of the roofs looked almost exactly the same as the archery pavilion, which was worrying to the author. However, a lengthy process of testing and developing the roof as well as the floor plan resulted in a beautiful piece of architecture sufficient for the Cederberg.



(Archdaily, 2020: online)

Figure 227: Archery pavilion section



(Archdaily, 2020: online)

Figure 228: Archery pavilion gutter

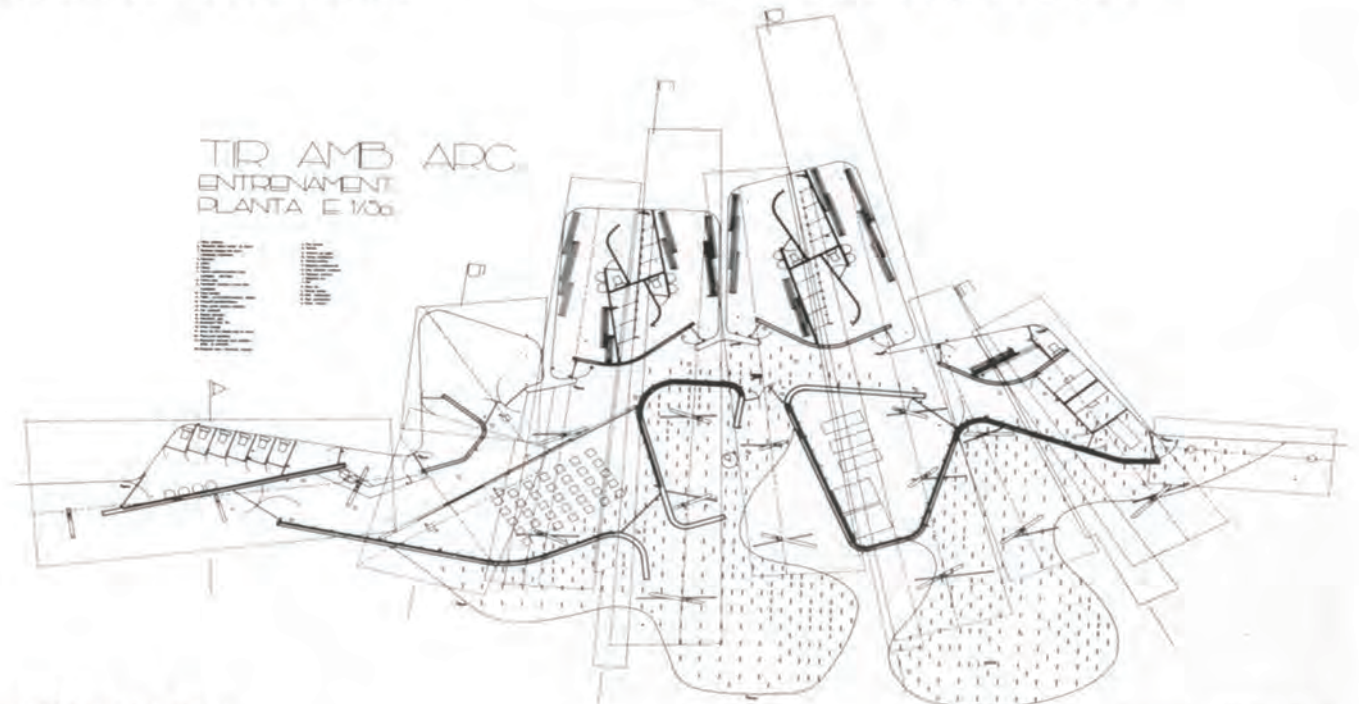


Figure 229: Floor Plan

(Archdaily, 2020: online)



(flickr.com, 2020: online)

Figure 230: columns and roof structure

The proposed design will consist of a concrete roof structure that is independent of the free-forming walls underneath. Refer to Figure 232. The layering of the in-situ concrete columns emphasises the layers of history on site. The concrete columns will not be cast in one day. Day joints will occur and depending on the source of sand, the colour of the concrete may also differ. Instead of preventing this from happening the process will be embraced in its imperfectness. These layers that will form will emphasise the layers of history that occur in the Stadsaal caves.



(Archdaily, 2020: online)

Figure 231: Section

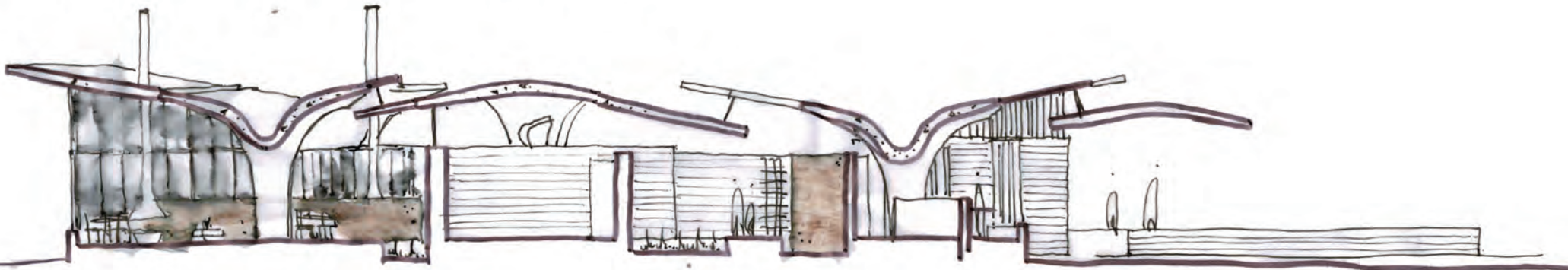


Figure 232: Section of proposed design

(Author, 2020)

## Design development

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The following section will discuss how the design developed, deriving ideas from its unique context.

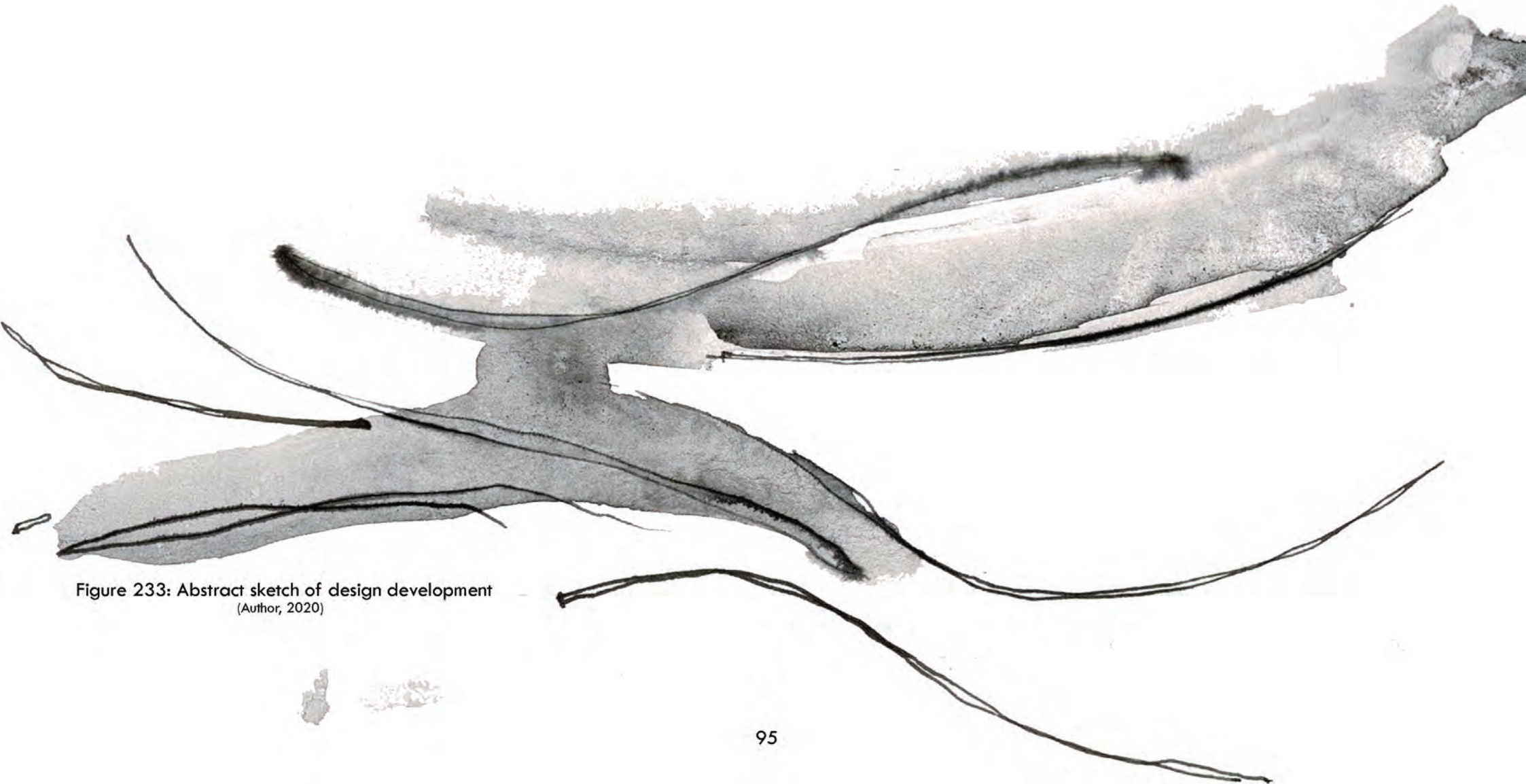


Figure 233: Abstract sketch of design development  
(Author, 2020)

The design process started off very naive, the corners were sharp and insensitive towards the landscape. The idea was to have numerous spaces that would clip onto a prominent wall leading through the design, forming a narrative. Refer to Figure 234 - 240.

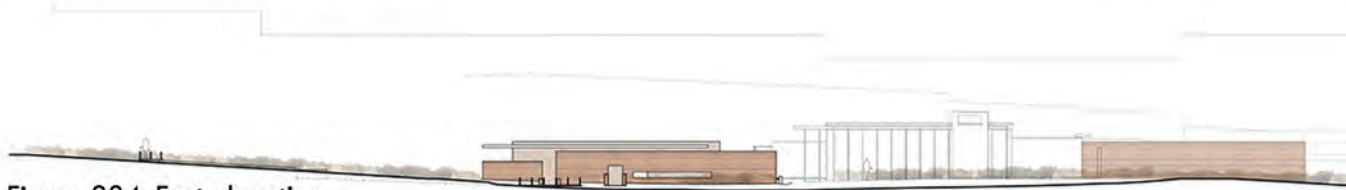


Figure 234: East elevation  
(Author, 2020)



Figure 235: Section A-A  
(Author, 2020)

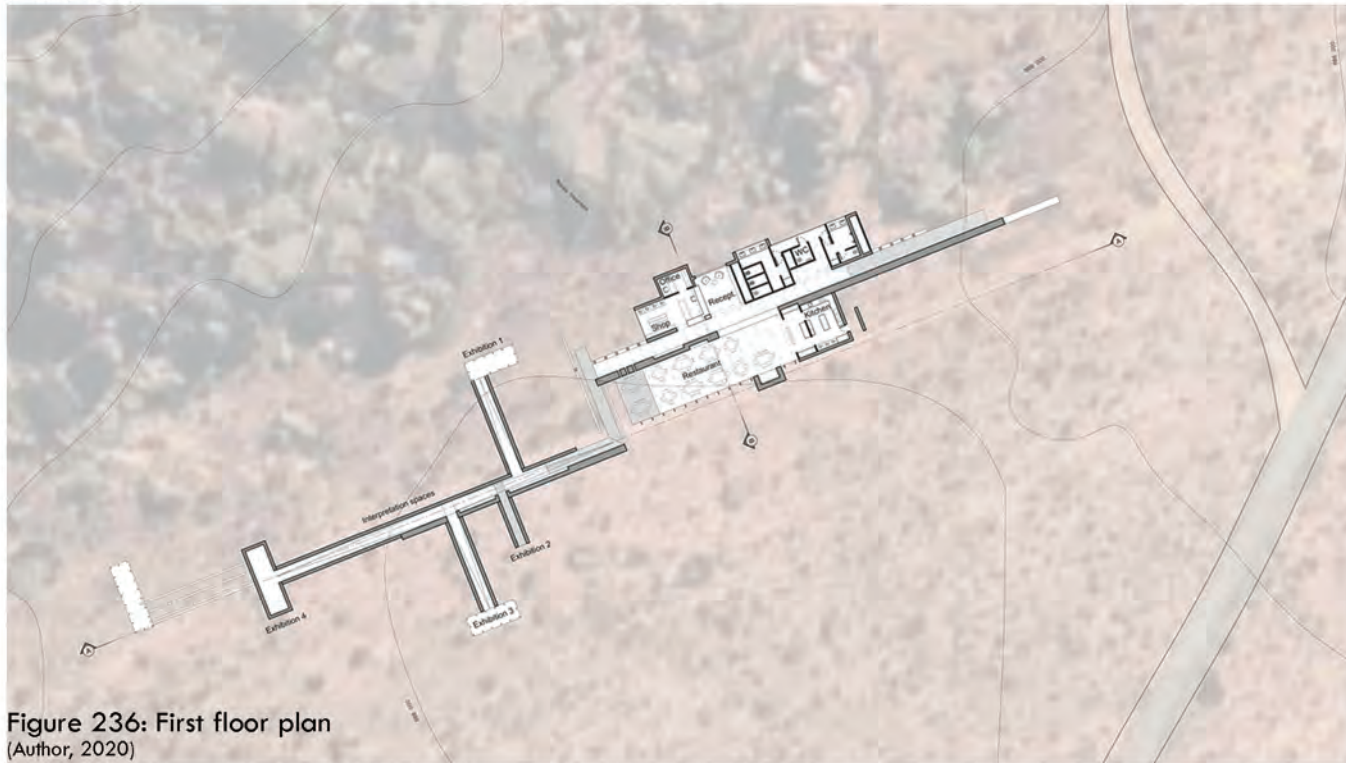


Figure 236: First floor plan  
(Author, 2020)

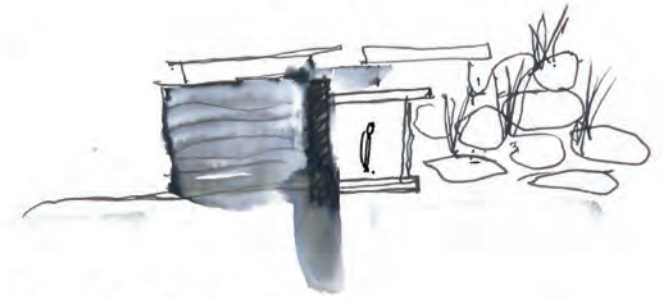


Figure 237: Sketch of entrance  
(Author, 2020)

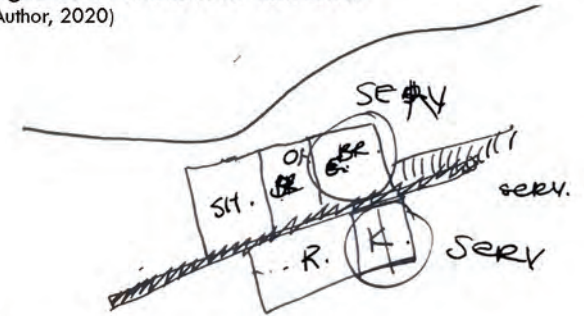


Figure 238: Planning diagram  
(Author, 2020)

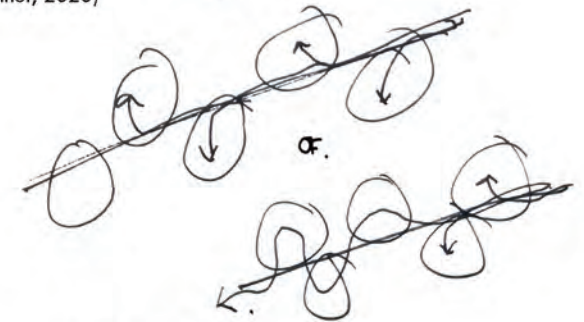


Figure 239: Circulation planning  
(Author, 2020)

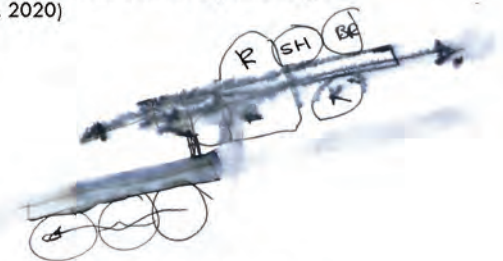


Figure 240: Planning diagram  
(Author, 2020)

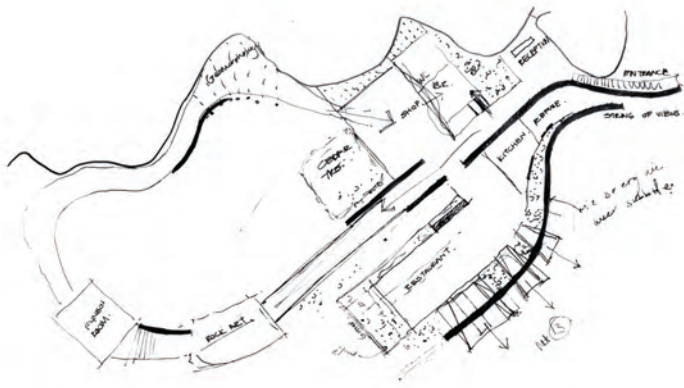


Figure 241: Floor plan development  
(Author, 2020)

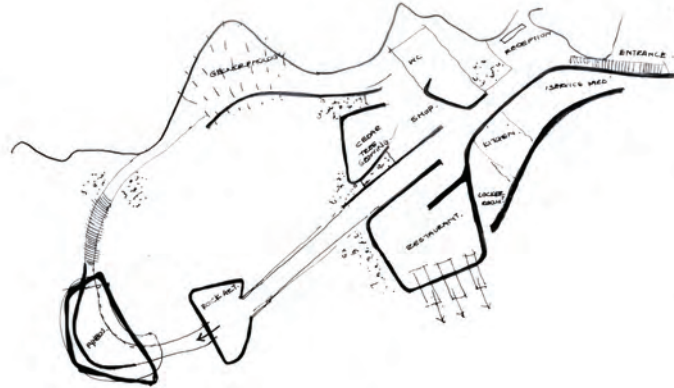


Figure 242: Floor plan development  
(Author, 2020)

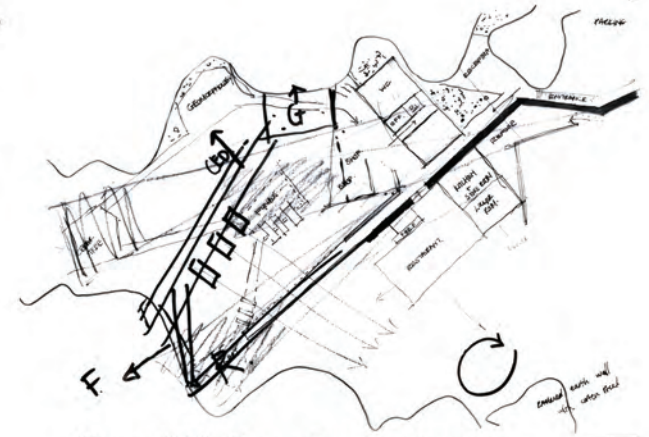


Figure 243: Floor plan development  
(Author, 2020)

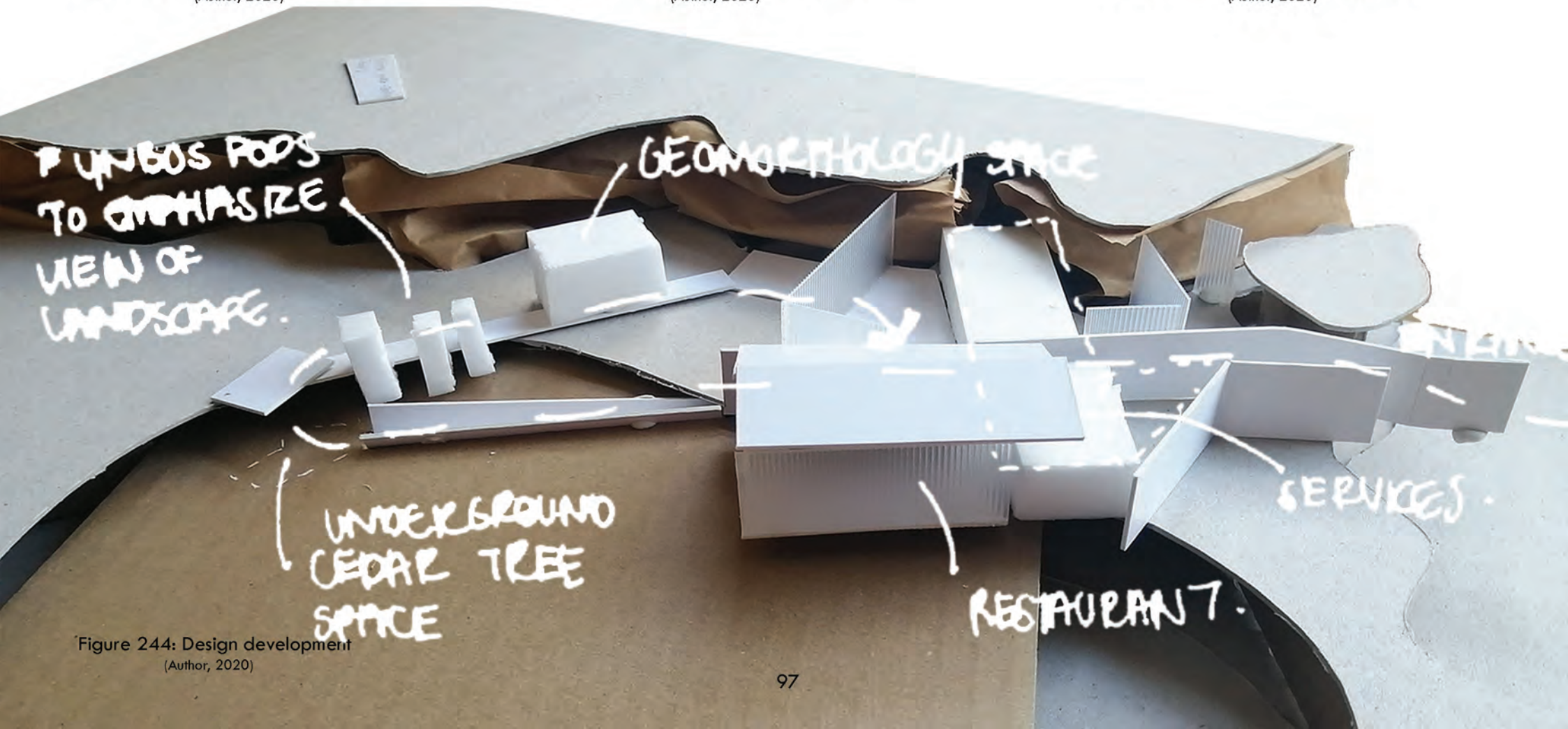


Figure 244: Design development  
(Author, 2020)



This Floor Plan was discussed in the first external exam, comments such as circulation, too large spaces, awkward corners, and the roof were concerns that were raised. A comment was made to rather take inspiration from the site directly. Refer to Figure 250 - 254.



Figure 250: Floor plan of first external exam  
(Author, 2020)

Figure 251: Parti-diagram  
(Author, 2020)

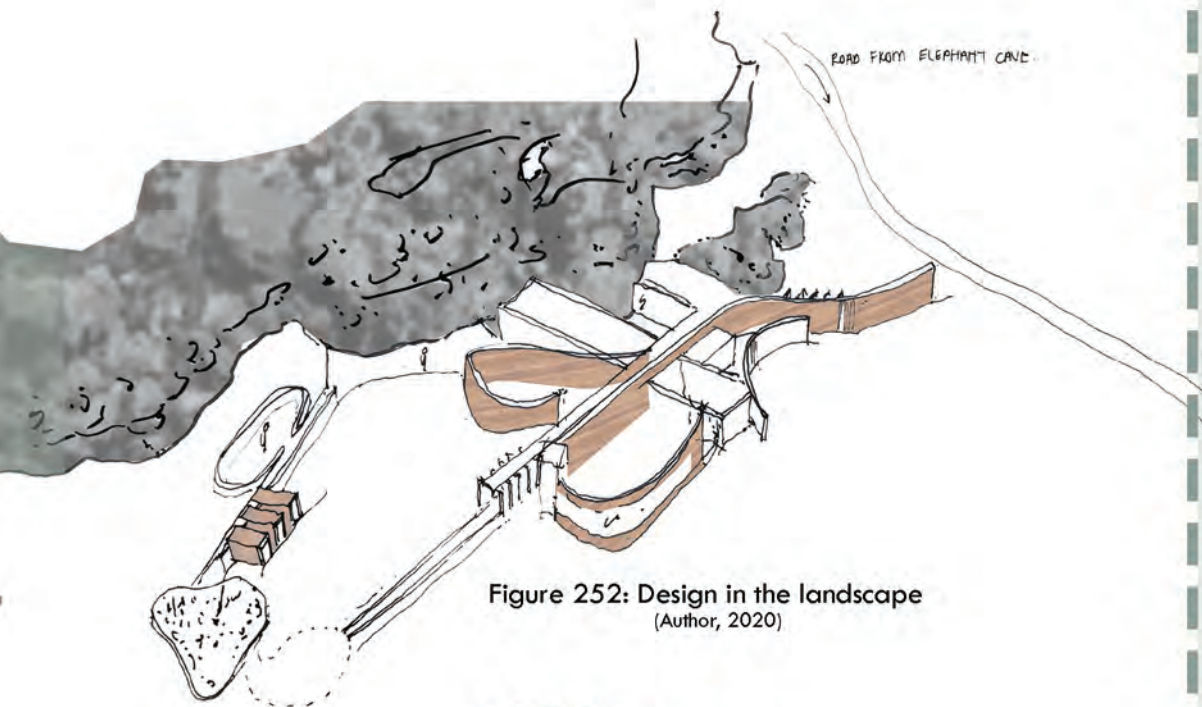


Figure 252: Design in the landscape  
(Author, 2020)

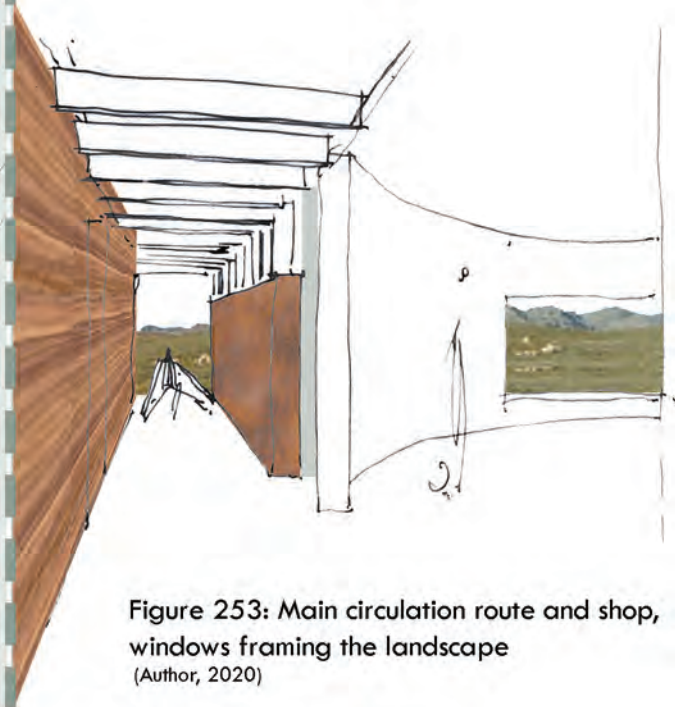


Figure 253: Main circulation route and shop,  
windows framing the landscape  
(Author, 2020)

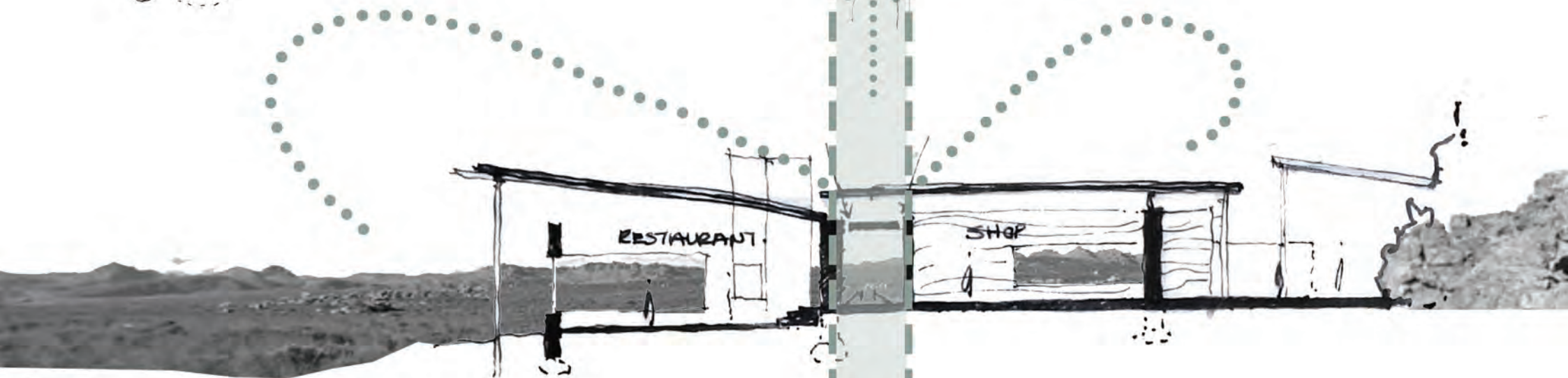


Figure 254: Section showing main circulation route,  
emphasizing the landscape  
(Author, 2020)



Therefore, a new approach towards the site was explored. The decision was made to approach the design through the rocks to create a nature-near experience, revealing the proposed design in the end. Refer to Figure 255 - 258.

An in-depth study of the geomorphology on site were analysed as one can see throughout the document to derive inspiration towards the proposed design. Refer to Figure 259 - 261.

Figure 255: Design exploration  
(Author, 2020)



Figure 256: Roof exploration  
(Author, 2020)

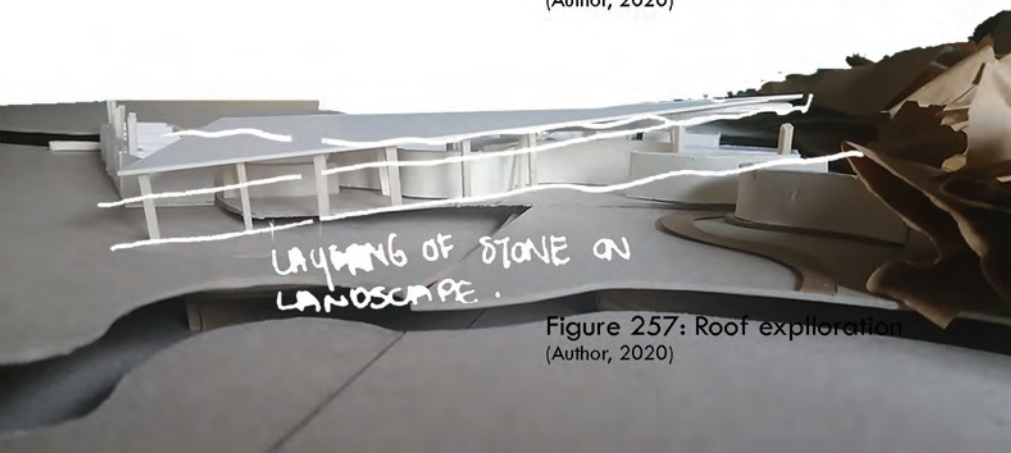


Figure 257: Roof exploration  
(Author, 2020)

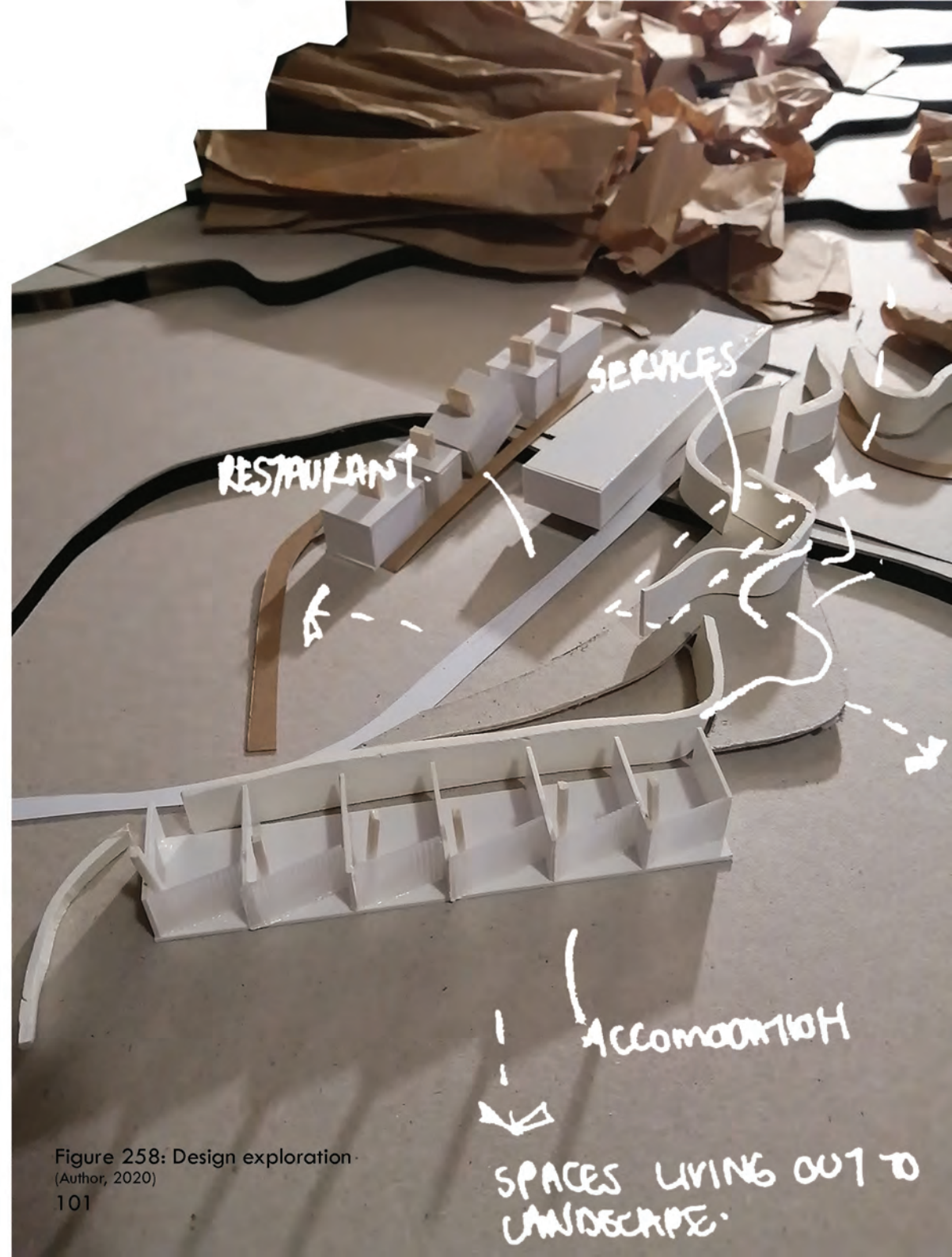


Figure 258: Design exploration  
(Author, 2020)

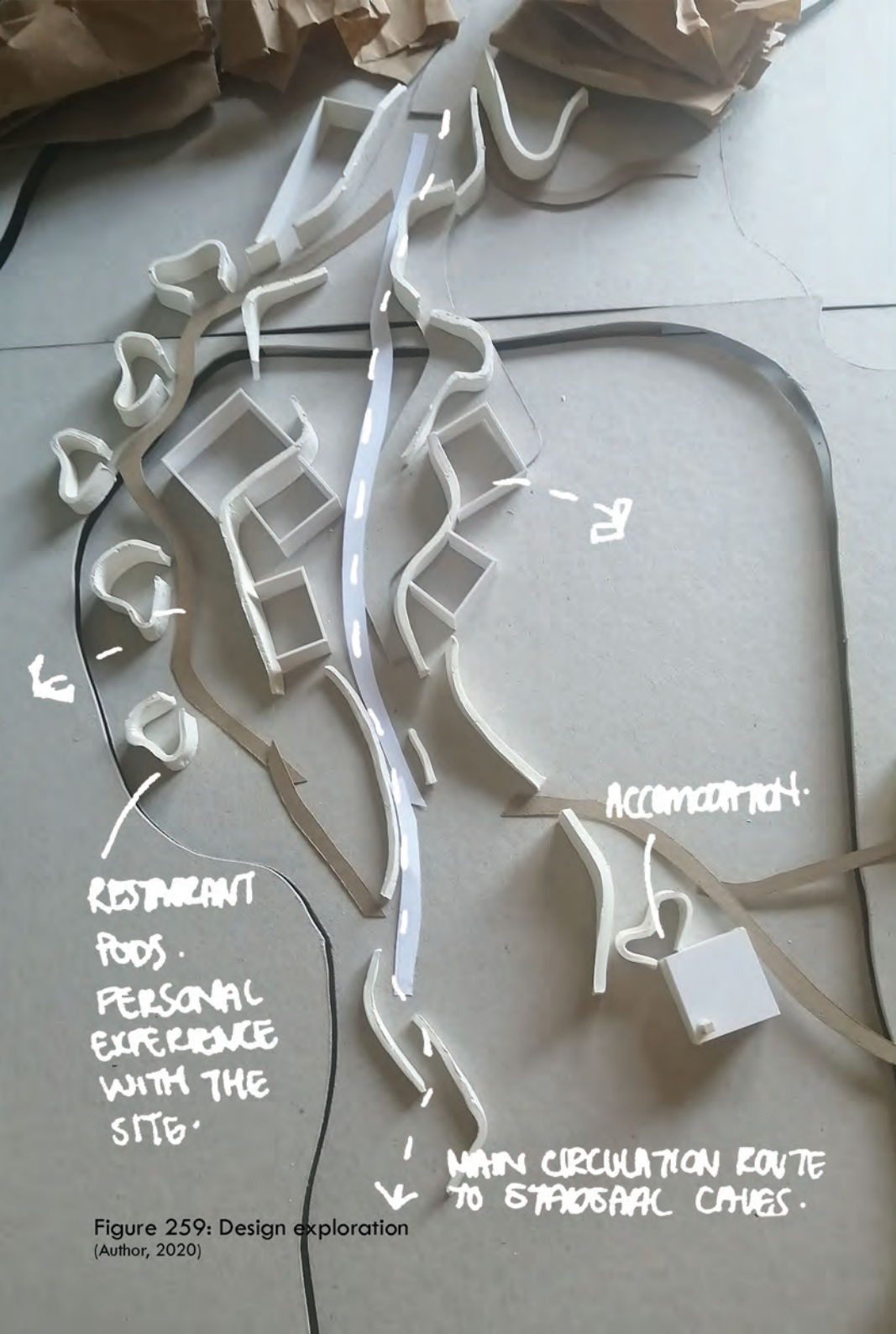


Figure 259: Design exploration  
(Author, 2020)



(Author, 2020)

Figure 260: Approaching the design through the rocks



(Author, 2020)

Figure 261: Inspiration derived from the geomorphology on site

The proposed design underwent numerous roof explorations. The structural approach was to have two different structural systems namely the free formed walls that run underneath the load-bearing roof. Refer to Figure 262 - 265.

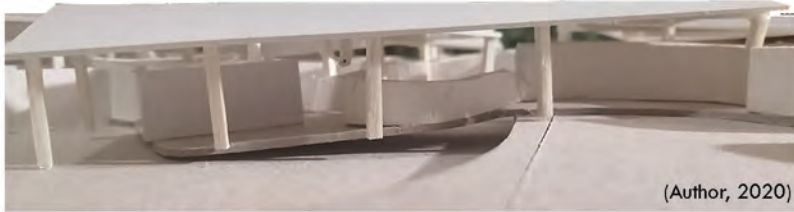


Figure 262: Load bearing roof covering free formed walls



Figure 264: Numerous roofs, trying to tie the spaces together as it seemed to scattered.

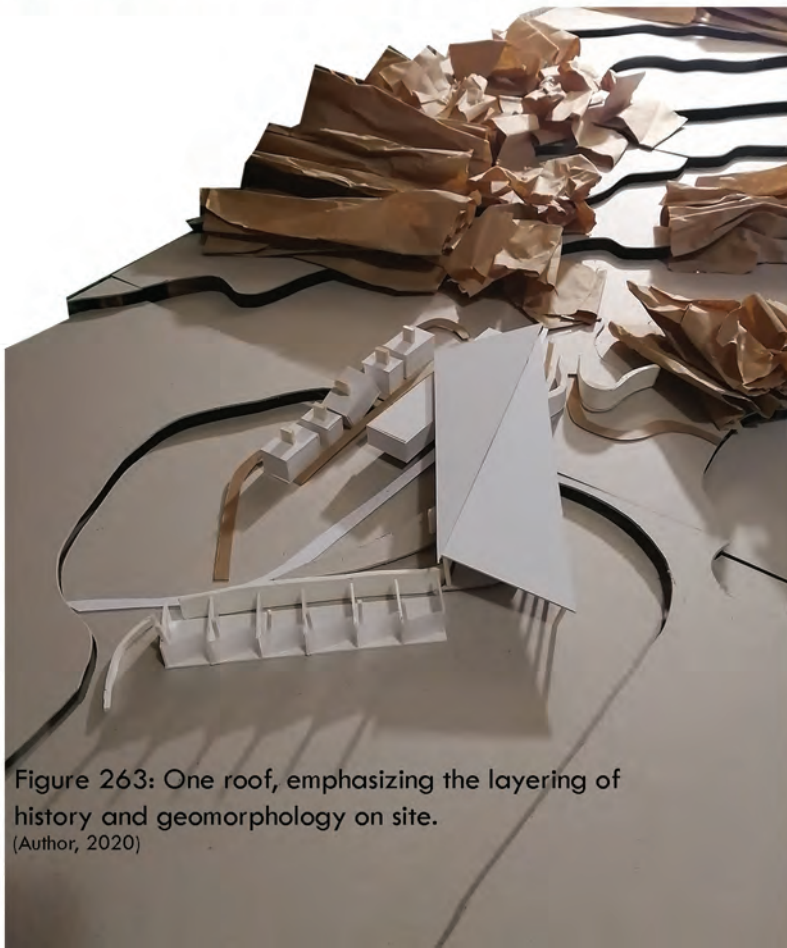


Figure 263: One roof, emphasizing the layering of history and geomorphology on site.  
(Author, 2020)



Figure 265: Numerous roofs, trying to tie the spaces together as it seemed to scattered.  
(Author, 2020)

# Restaurant



Figure 266: Restaurant exploration  
(Author, 2020)

Figure 267: Roof exploration  
(Author, 2020)

It was decided upon to not have completely secluded pods for the restaurant. The curved walls were lowered, and spaces were demarcated, whilst still being able to look over them towards the landscape. Refer to Figure 266.

Several roof options were explored. The roof concept was derived from the cedar tree and fynbos fire balance. The load bearing roof should be carefully designed to form the perfect balance over the free formed walls, as nature does. Refer to Figure 267 and 268.

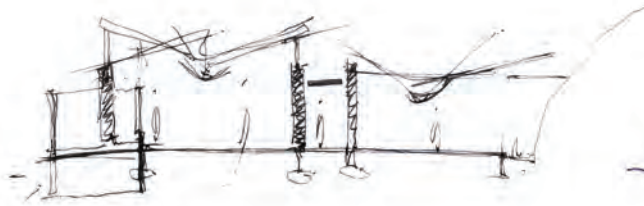


Figure 268: Restaurant exploration regarding the balances of nature  
(Author, 2020)



Figure 269: 'Horizontal roof'  
(Author, 2020)



Figure 270: 'Vertical roof'  
(Author, 2020)

This roof consisted of concrete gutters, as well as a steel frame and a timber ceiling attached to it.

Two roof orientations were considered, 'horizontally' and 'vertically'. Refer to Figure 269 and 270.

Taking the sun into consideration, the 'horizontal, roof was a better choice in terms of angling the solar panels towards North. However, during the external review it was mentioned again that the roof seems as if it wants to be placed vertically and would read better on the site. Therefore, the decision was made to rotate the roof and a solar farm was suggested. In the end this also worked better, taking into consideration that one would be able to see the roof from above when looking over the landscape from the elephant cave.

One can also note that the initial instinct was to rotate the roof vertically.

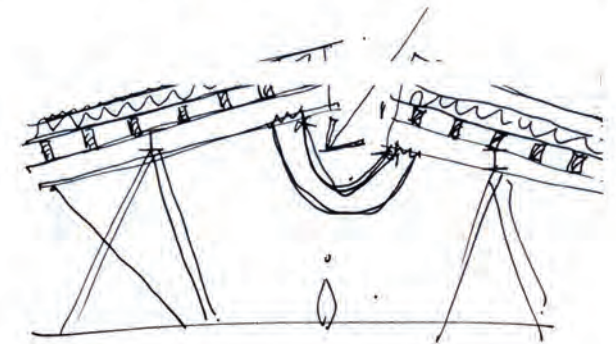
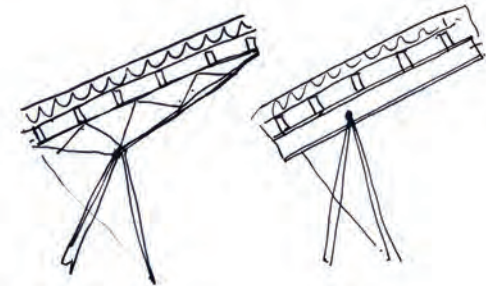
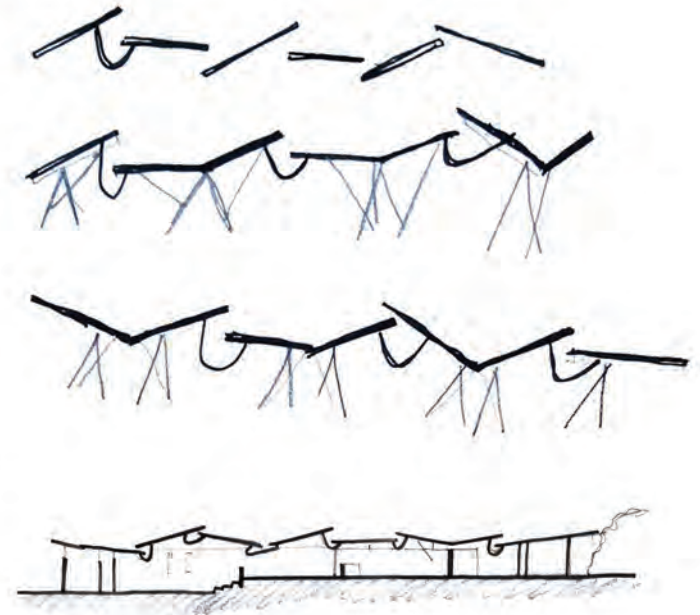


Figure 272: Roof development  
(Author, 2020)



Figure 271: Archery pavilion done by Enric Miralles (Blogger, 2020: online)

Miralles was a big influence towards the roof design process. Refer to Figure 271 - 277.

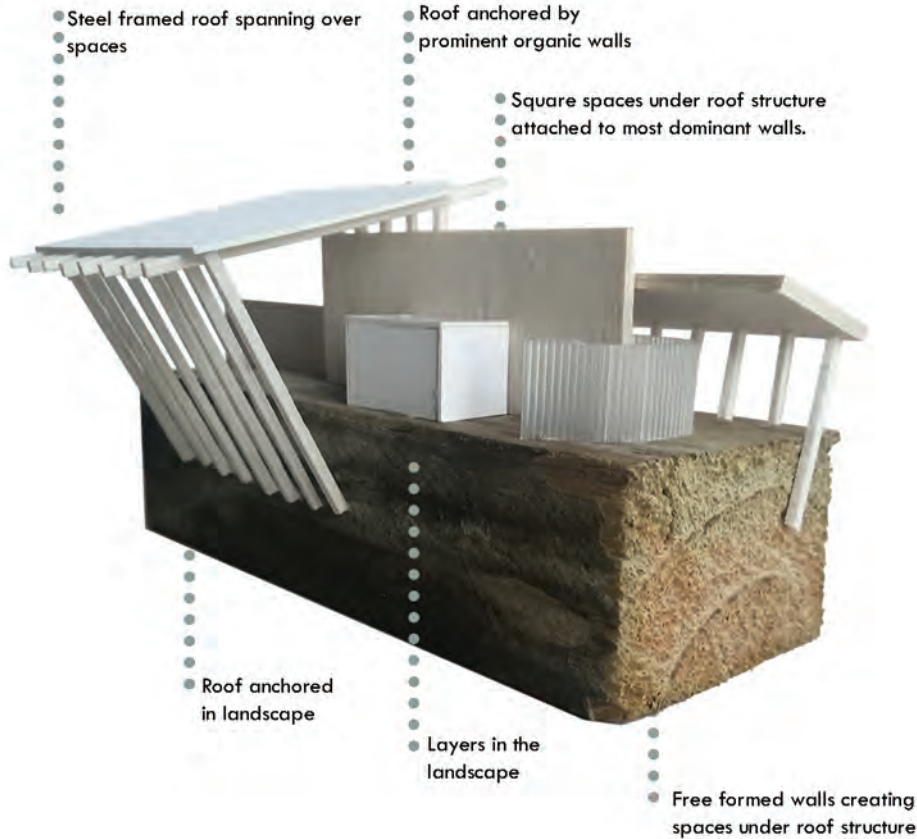


Figure 273: Construction touchstone  
(Author, 2020)

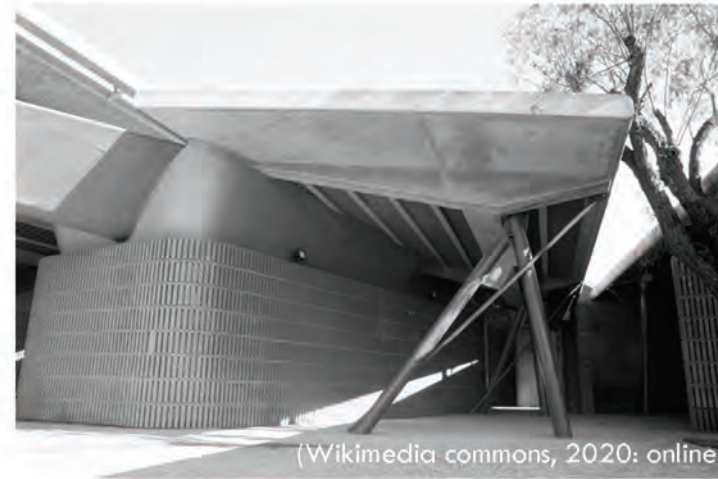


Figure 274: Precedent, Enric Miralles, Archery pavilion

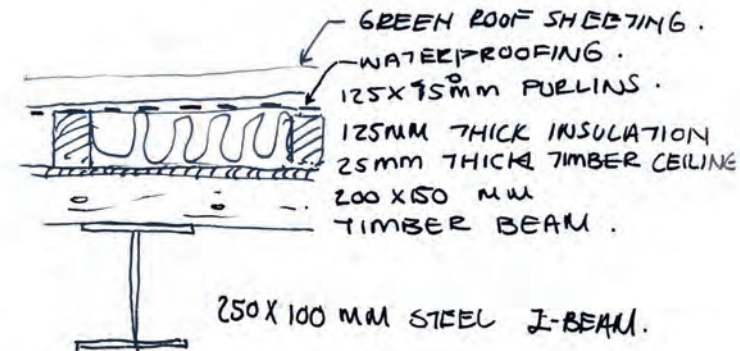


Figure 275: Roof detail  
(Author, 2020)



Timber



Corten steel



Stacked stone



Steel

Figure 276:  
Material palette  
(Author, 2020)

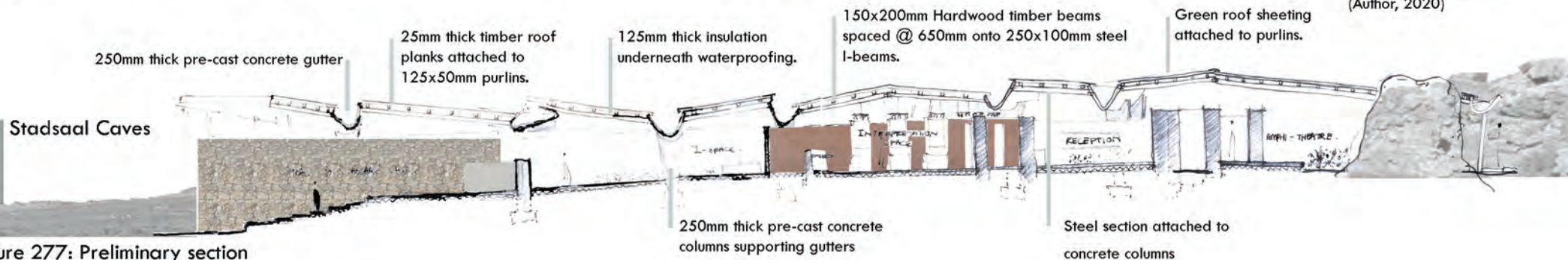
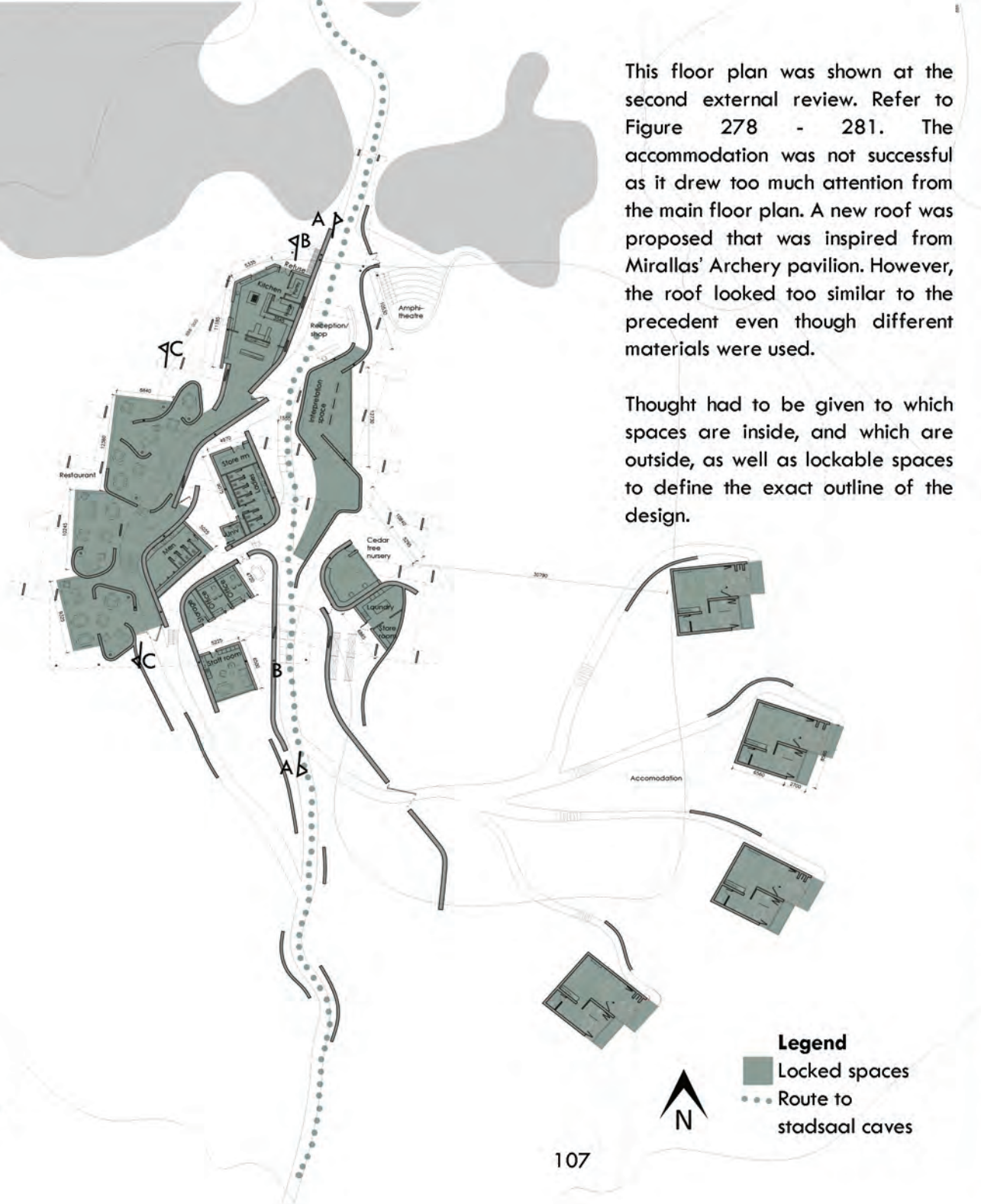


Figure 277: Preliminary section  
(Author, 2020)

Figure 278: Floor Plan  
(Author, 2020)



This floor plan was shown at the second external review. Refer to Figure 278 - 281. The accommodation was not successful as it drew too much attention from the main floor plan. A new roof was proposed that was inspired from Mirallas' Archery pavilion. However, the roof looked too similar to the precedent even though different materials were used.

Thought had to be given to which spaces are inside, and which are outside, as well as lockable spaces to define the exact outline of the design.



Figure 279: Floor plan development  
(Author, 2020)



Figure 280: new proposed  
(Author, 2020)



Figure 281: South elevation  
(Author, 2020)

The hierarchy of spaces were carefully considered and how it read on plan. Refer to Figure 282 - 290.



Figure 282: Floor Plan  
(Author, 2020)



Figure 283: Hiking trail through building  
(Author, 2020)



Figure 284: Restaurant  
(Author, 2020)



Figure 285: Hierarchy of spaces  
(Author, 2020)



(Author, 2020)

Figure 286: South East view



Figure 287: View from restaurant



Figure 288: East elevation  
(Author, 2020)



Figure 289: View of restaurant  
(Author, 2020)

Stadsaal Caves

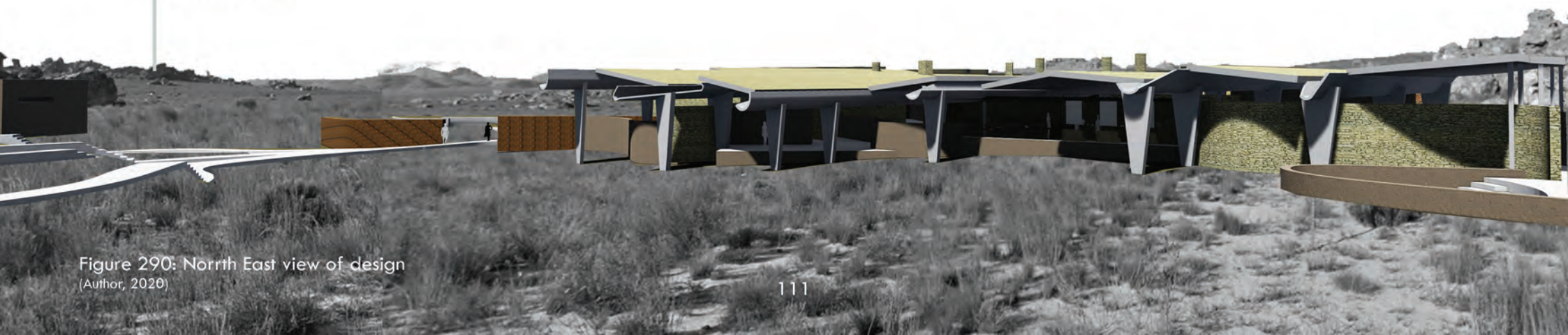


Figure 290: North East view of design  
(Author, 2020)

The accommodation was inspired from free standing rock masses in the landscape. Refer to Figure 291 - 294.



Figure 292: Rock masses in the

(Author, 2019)

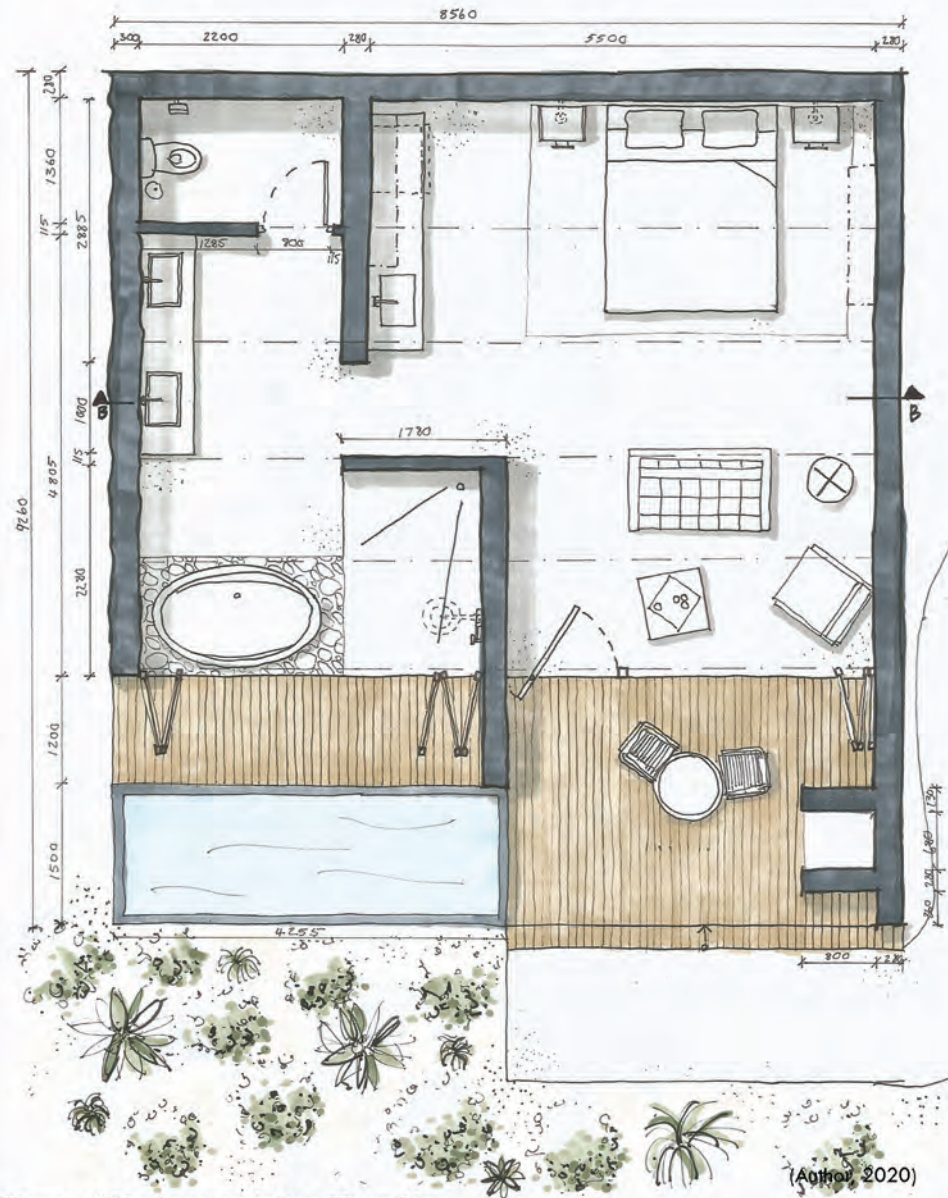


Figure 291: Accommodation Floor Plan

(Author, 2020)

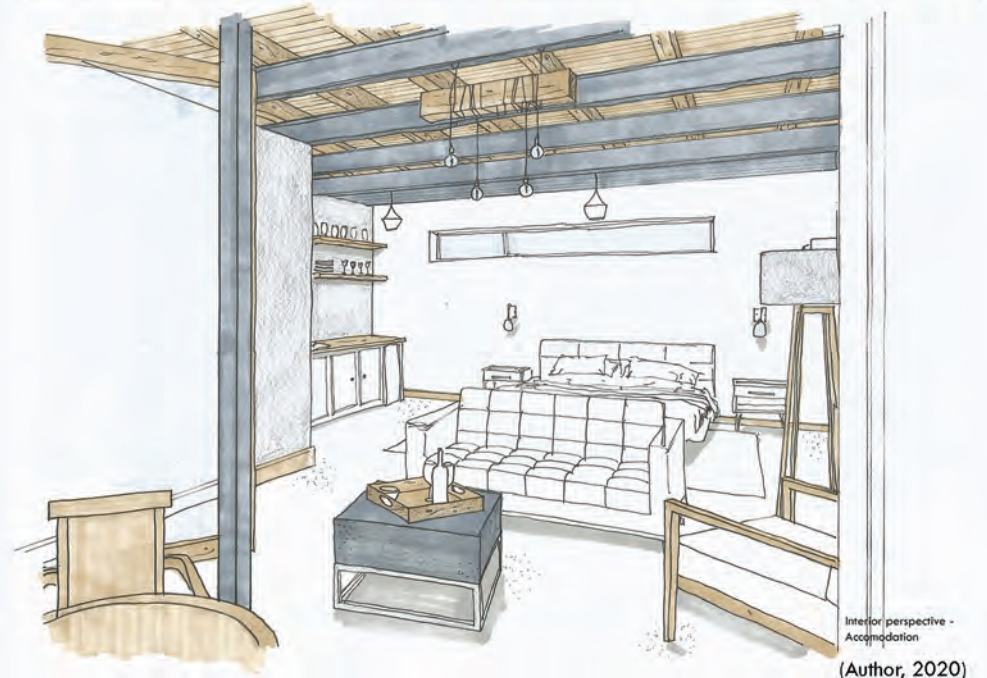


Figure 293: Accommodation perspective

Interior perspective - Accommodation  
(Author, 2020)

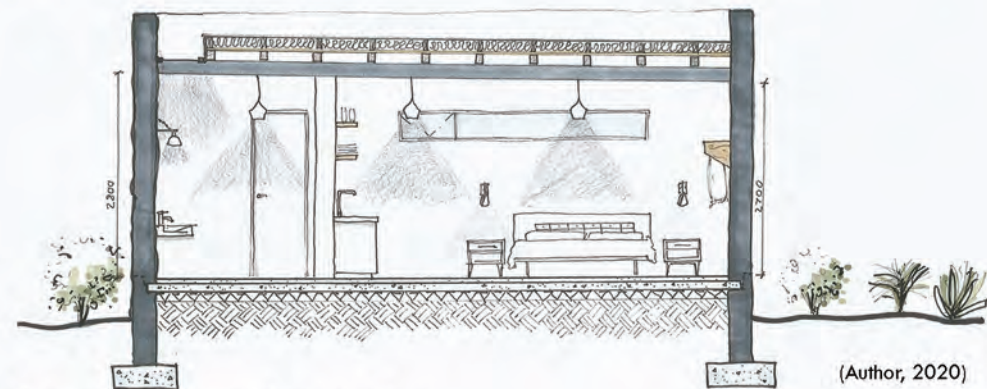
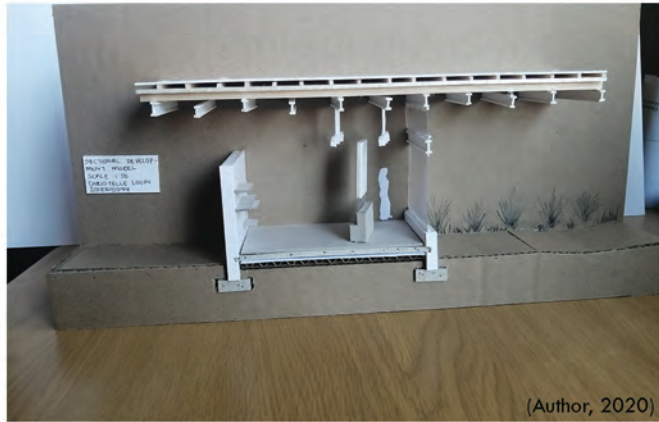


Figure 294: Accommodation section

(Author, 2020)

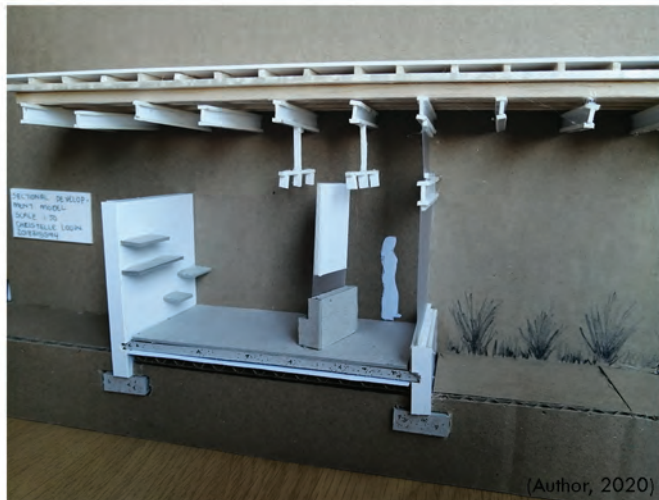


Spaces will overlook the landscape such as the interpretation space and the restaurant to emphasize the nature-near approach and to create the constant awareness of being in the landscape. Refer to Figure 295 - 300.



(Author, 2020)

Figure 298: Sectional model



(Author, 2020)

Figure 299: Sectional model



(Author, 2020)

Figure 300: Sectional model of interpretation space



(Author, 2019:)

Figure 301: Geomorphology inspiration



(Author, 2019:)

Figure 302: Geomorphology inspiration



(Author, 2019:)

Figure 303: Geomorphology inspiration

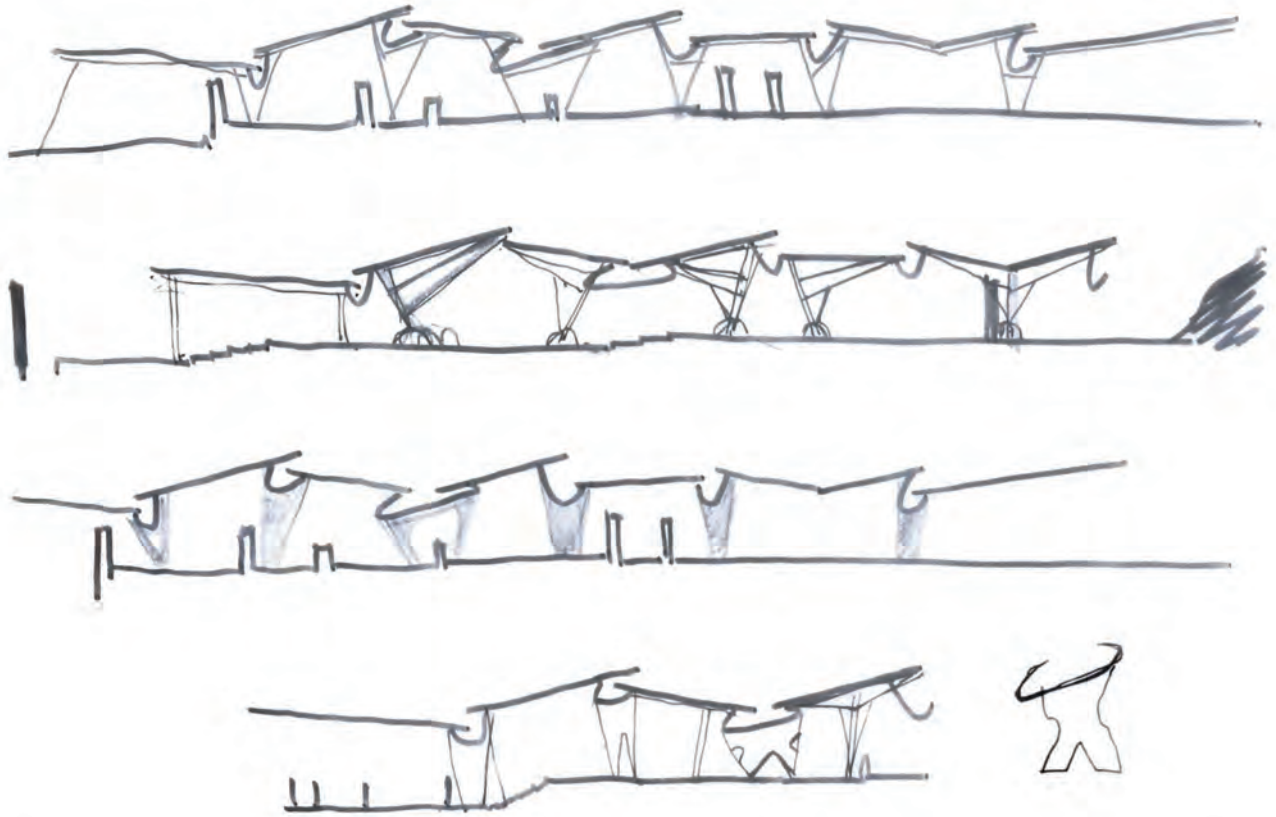


Figure 304: Roof and column exploration

(Author, 2020)



Figure 305: Column exploration

(Author, 2020)

The roof and column shapes were derived from the surrounding geomorphology. Refer to Figure 301 - 309.

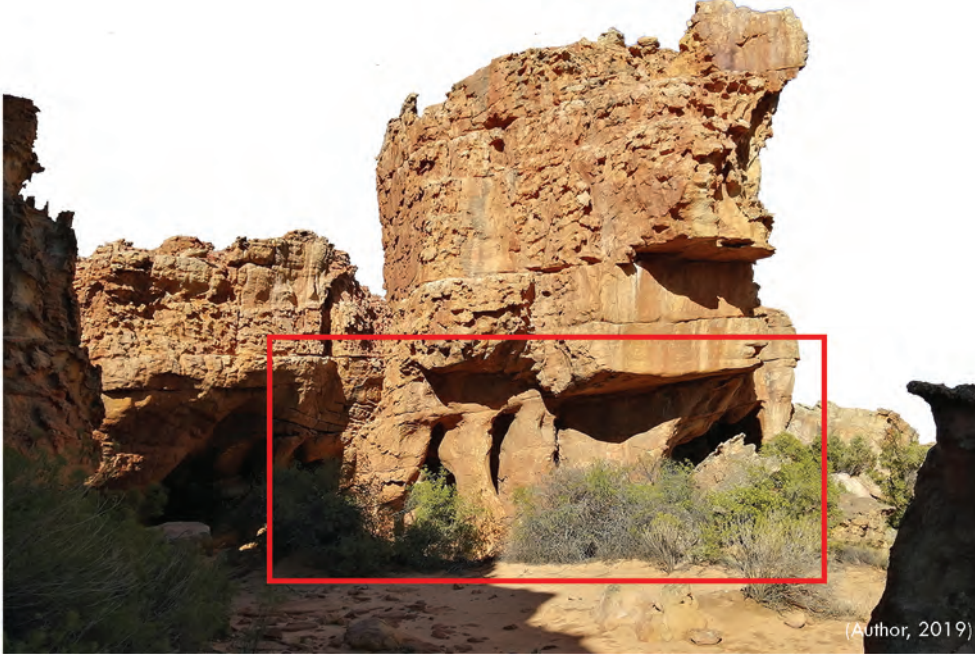


Figure 306: Column inspiration from geomorphology

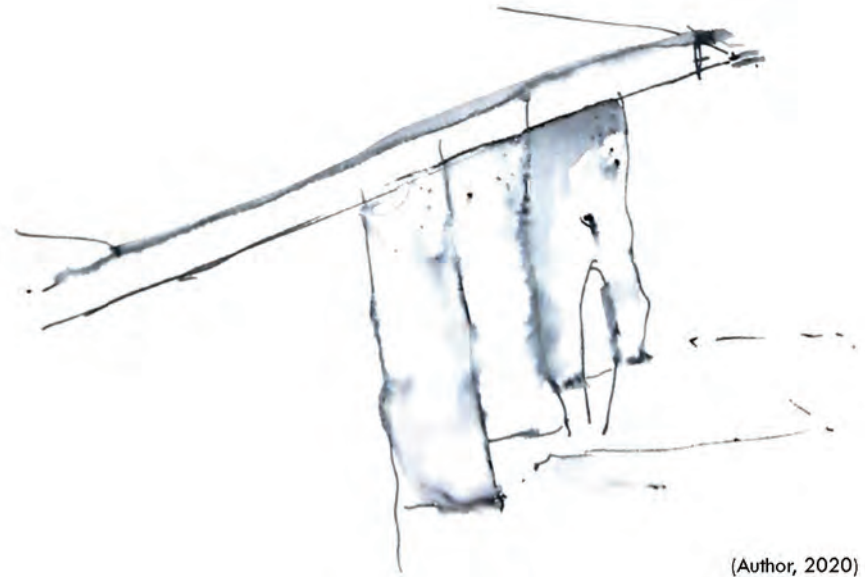


Figure 307: Column exploration



Figure 308: Column inspiration from geomorphology

Figure 309: Column inspiration

Geomorphological features were once again analysed to extend inspiration. The gutters and columns were influenced by Figure 310, and a column exploration followed. Refer to Figure 311 - 312.

It was decided to rotate the roof vertically to integrate the context more. Refer to Figure 313 - 318.



Figure 310: Inspiration derived from geomorphology

(Author, 2019)

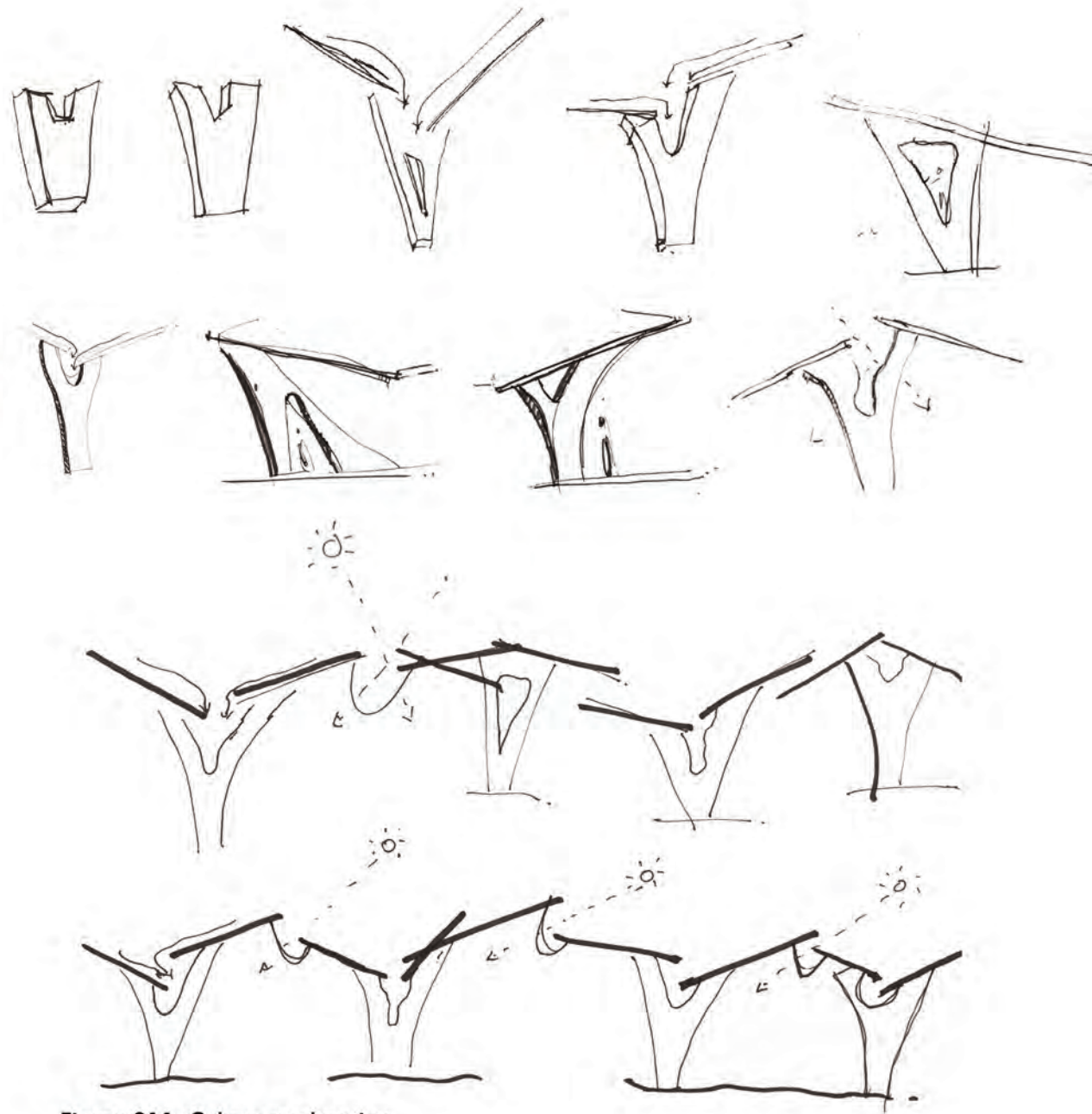


Figure 311: Column exploration  
(Author, 2020)



Figure 312: Column exploration  
(Author, 2020)



Figure 313: Roof development  
(Author, 2020)

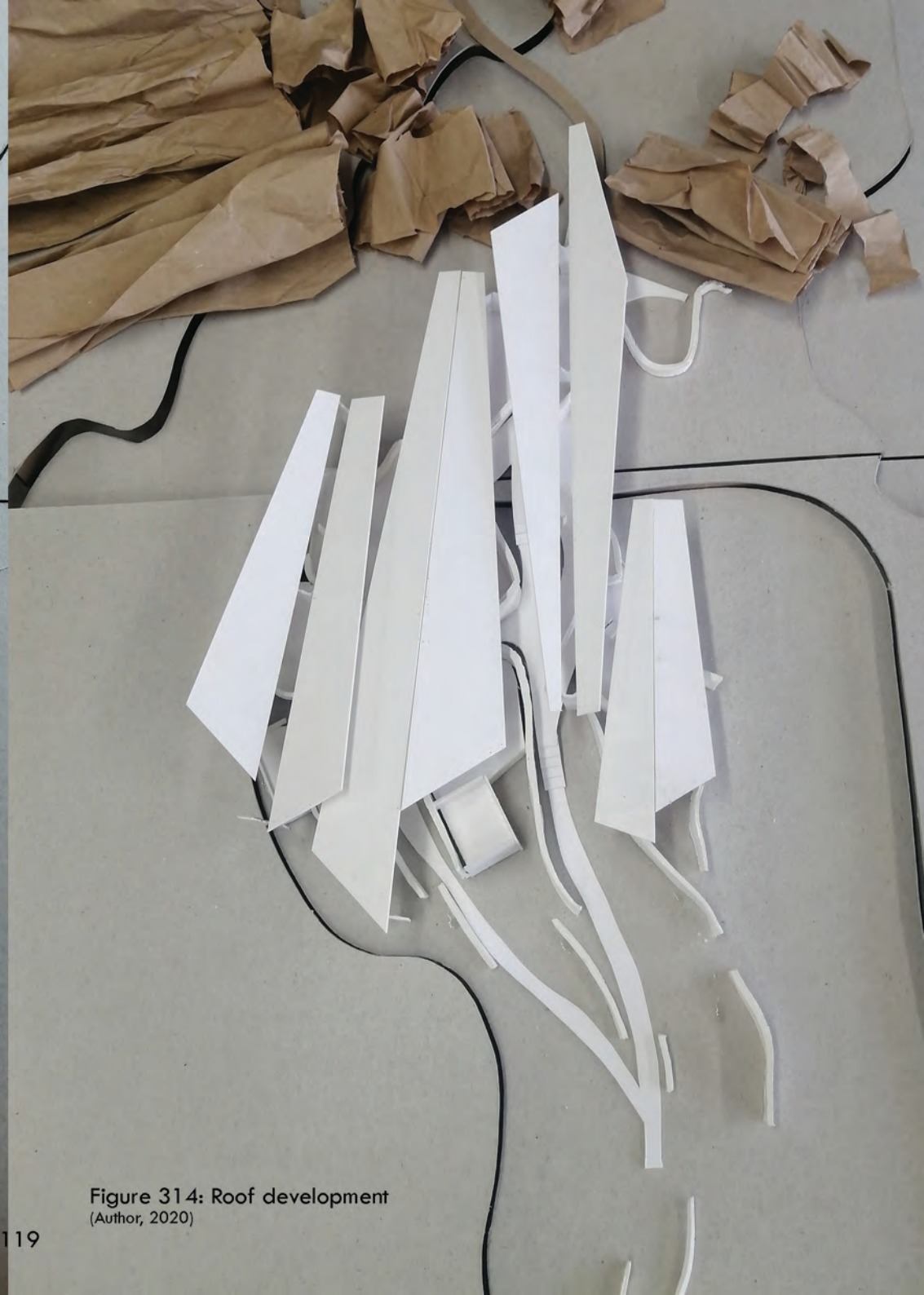


Figure 314: Roof development  
(Author, 2020)



(Author, 2020)

Figure 315: Interpretation space



(Author, 2020)

Figure 316: Restaurant



(Author, 2020)

Figure 317: Sout East view



(Author, 2020)

Figure 318: Design in the landscape

Pre-cast columns and pile foundations were suggested during the engineers' crit. However, pad foundations are more sufficient, and the site access is too difficult to transport pre-cast elements to site. Therefore, it was chosen upon to do in-situ concrete.

Stacked stone, corten steel as well as boarded concrete walls were suggested materials for the free-formed walls. With a timber and concrete ceiling as well, the materials became too overwhelming. Therefore, the decision was made to only use boarded concrete walls and one or two corten steel walls. Refer to Figure 319 - 321.

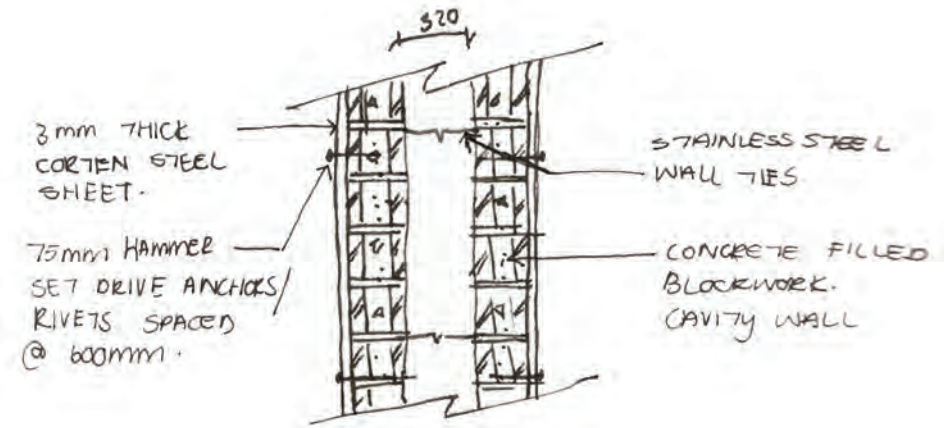


Figure 320: Corten steel wall detail  
(Author, 2020)

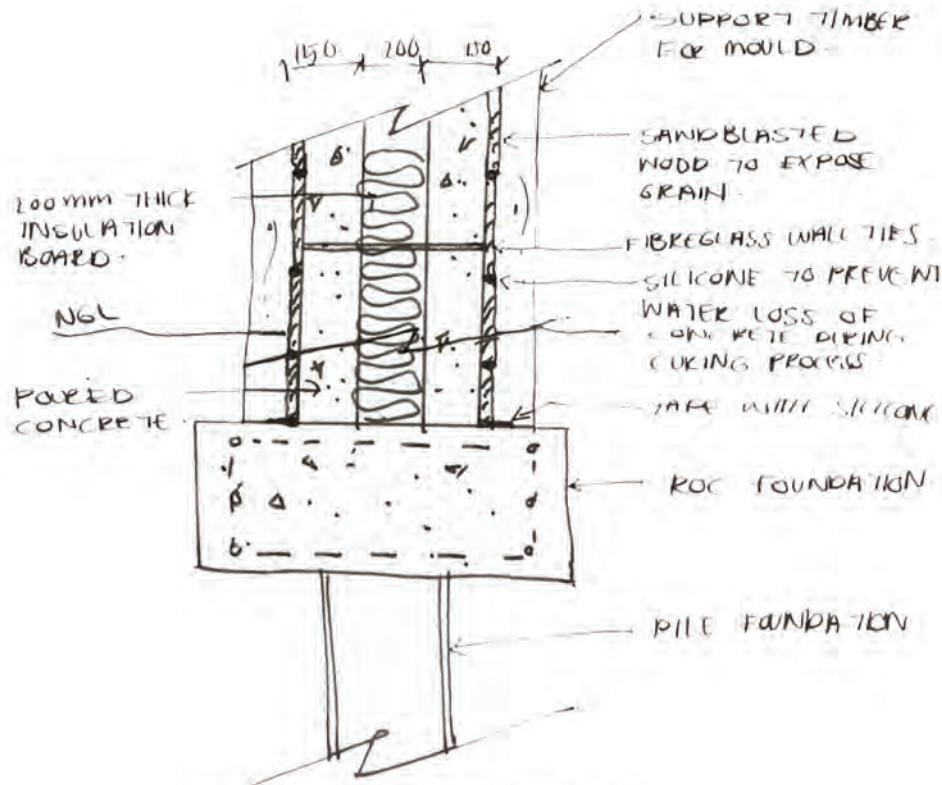


Figure 319: Boarded concrete wall detail  
(Author, 2020)

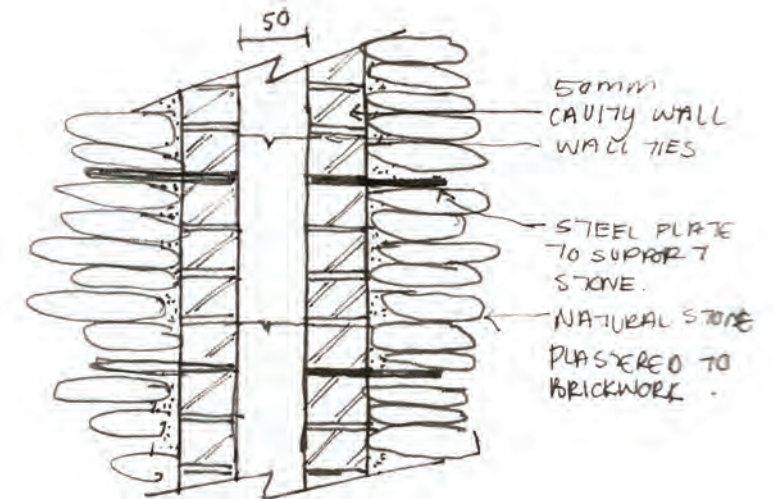


Figure 321: Stacked stone wall detail  
(Author, 2020)

As mentioned before, pre-cast concrete elements were suggested on site. Options were explored as to how to seal the panels and how to insulate the roof. However, it was decided to have a hybrid roof structure of a concrete gutter and steel and timber edges. If the complete roof had to be concrete, the edges would break off because the spans are too long and the edges become too heavy. Refer to Figure 322 - 327 for roof exploration details.

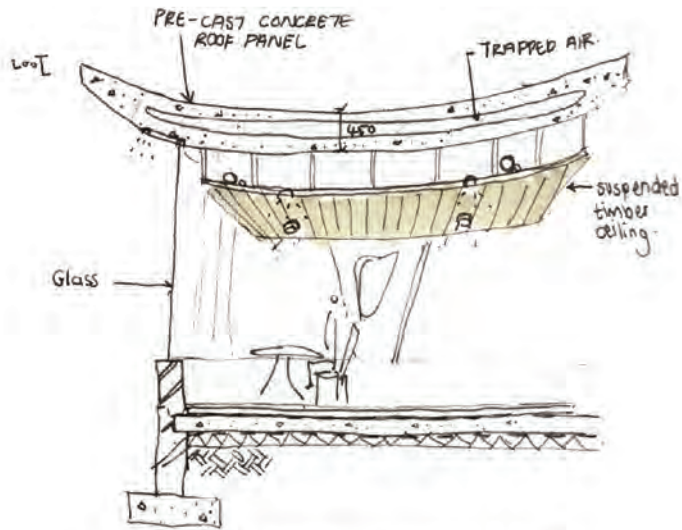


Figure 322: section of insulated ceiling  
(Author, 2020)

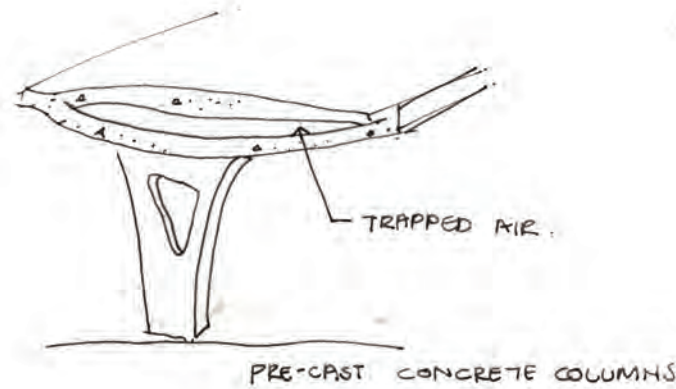


Figure 323: Insulated concrete roof  
(Author, 2020)

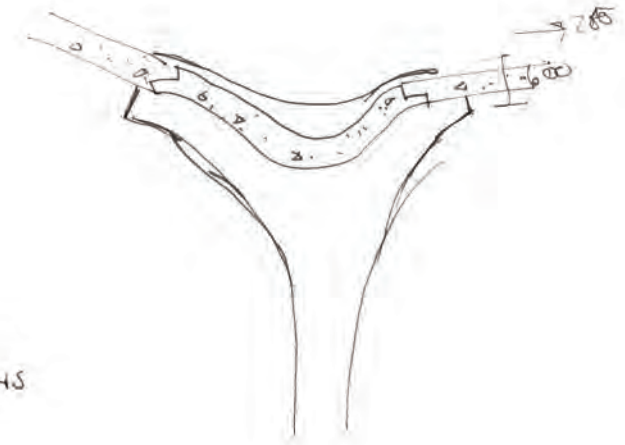


Figure 324: Pre-cast concrete elements, column and gutter  
(Author, 2020)

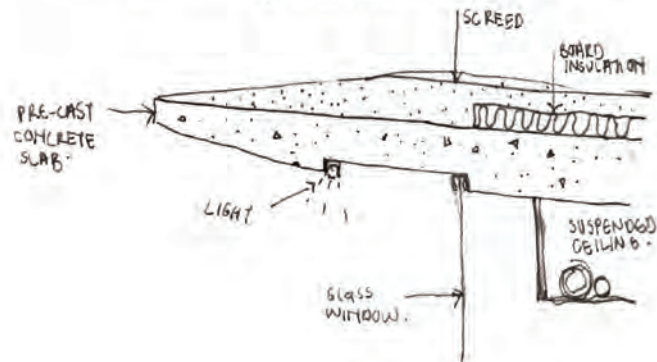


Figure 325: Roof edge  
(Author, 2020)

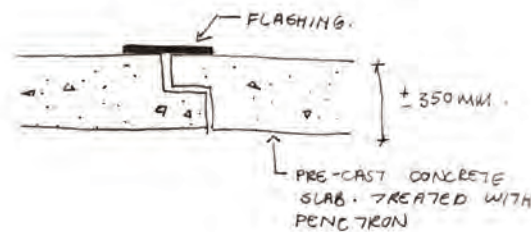


Figure 326: Waterproofing of concrete elements  
(Author, 2020)

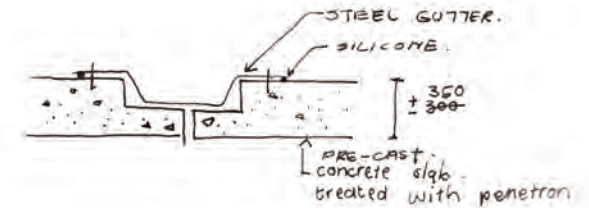


Figure 327: Waterproofing between concrete roof panels  
(Author, 2020)



Figure 328: Last external review model  
(Author, 2020)

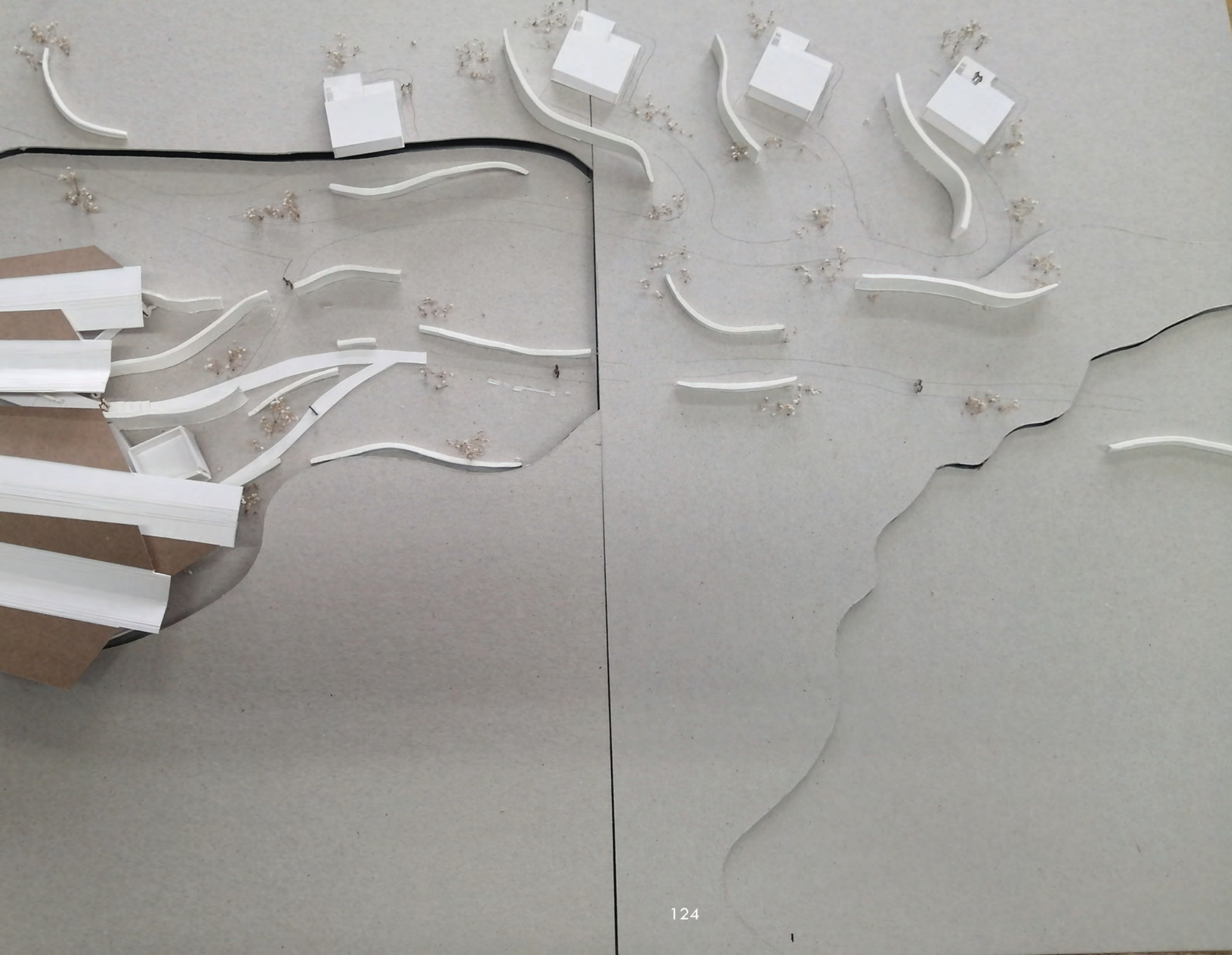




Figure 329: Proposed design from South view  
(Author, 2020)

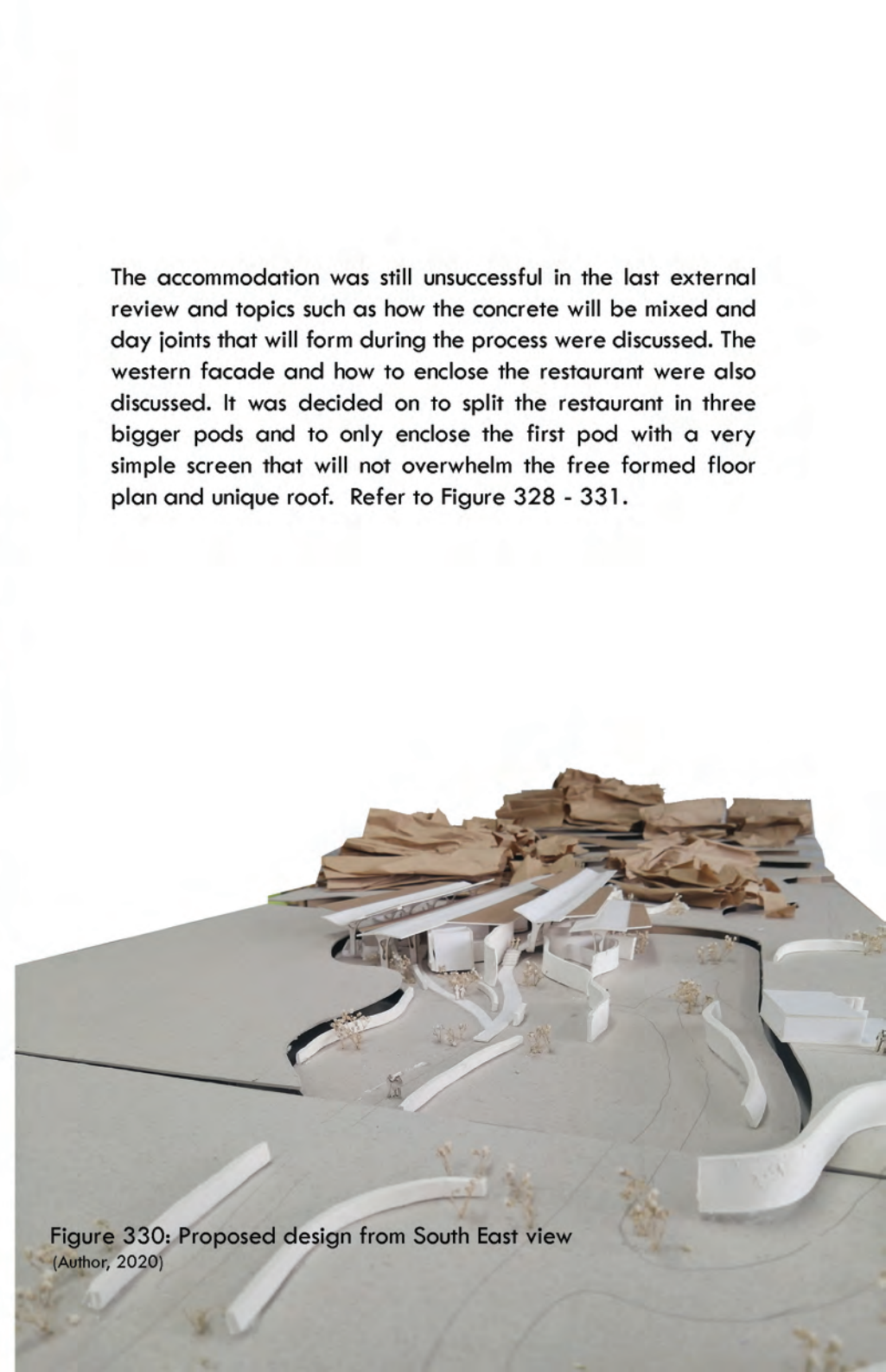


Figure 330: Proposed design from South East view  
(Author, 2020)

The accommodation was still unsuccessful in the last external review and topics such as how the concrete will be mixed and day joints that will form during the process were discussed. The western facade and how to enclose the restaurant were also discussed. It was decided on to split the restaurant in three bigger pods and to only enclose the first pod with a very simple screen that will not overwhelm the free formed floor plan and unique roof. Refer to Figure 328 - 331.



Figure 331: View of restaurant  
(Author, 2020)

Screens were tested and it was discussed that a simple screen that does not attract too much attention is the better choice. The floor plan and the roof structure are already there to make a statement. Refer to Figure 332 and 333.

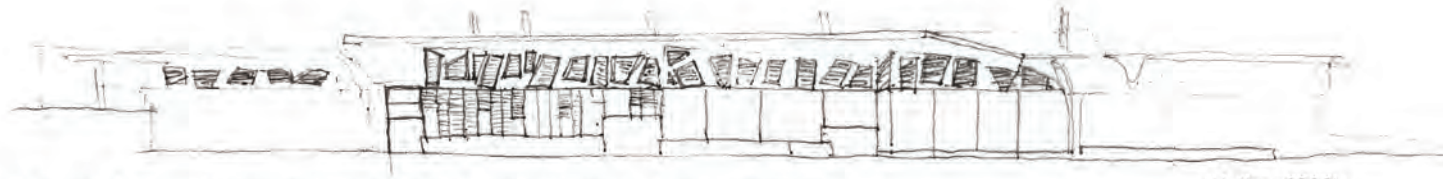


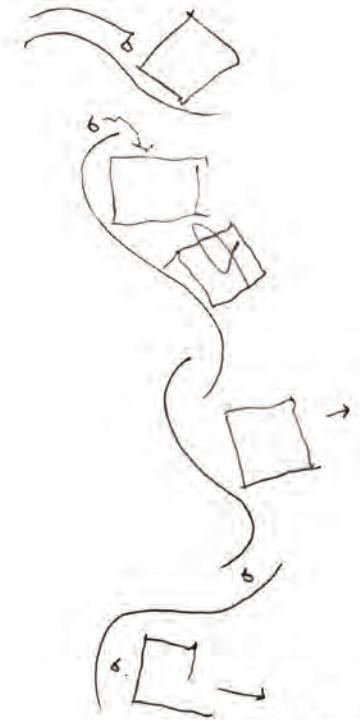
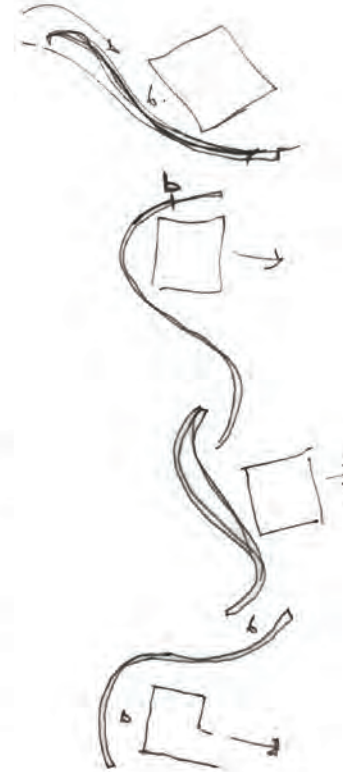
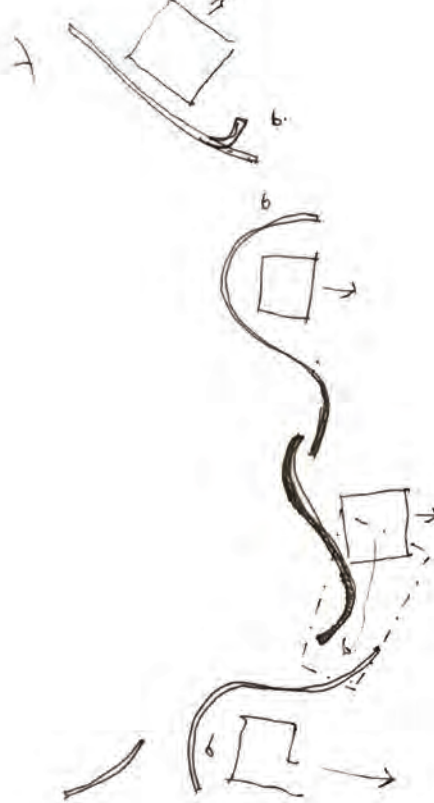
Figure 332: A screen that was tested on the facade but was too busy.

(Author, 2020)



Figure 333: Screen tested from geomorphology (Author, 2020)

The accommodation underwent a design process to arrive at a solution that would not attract too much attention from the main floor plan and to speak the same architectural language as the interpretation centre. Refer to Figure 334.



(Author, 2020)

Figure 334: Accomodation development

## Design synthesis

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The following section will summarise the design and explain how it functions.

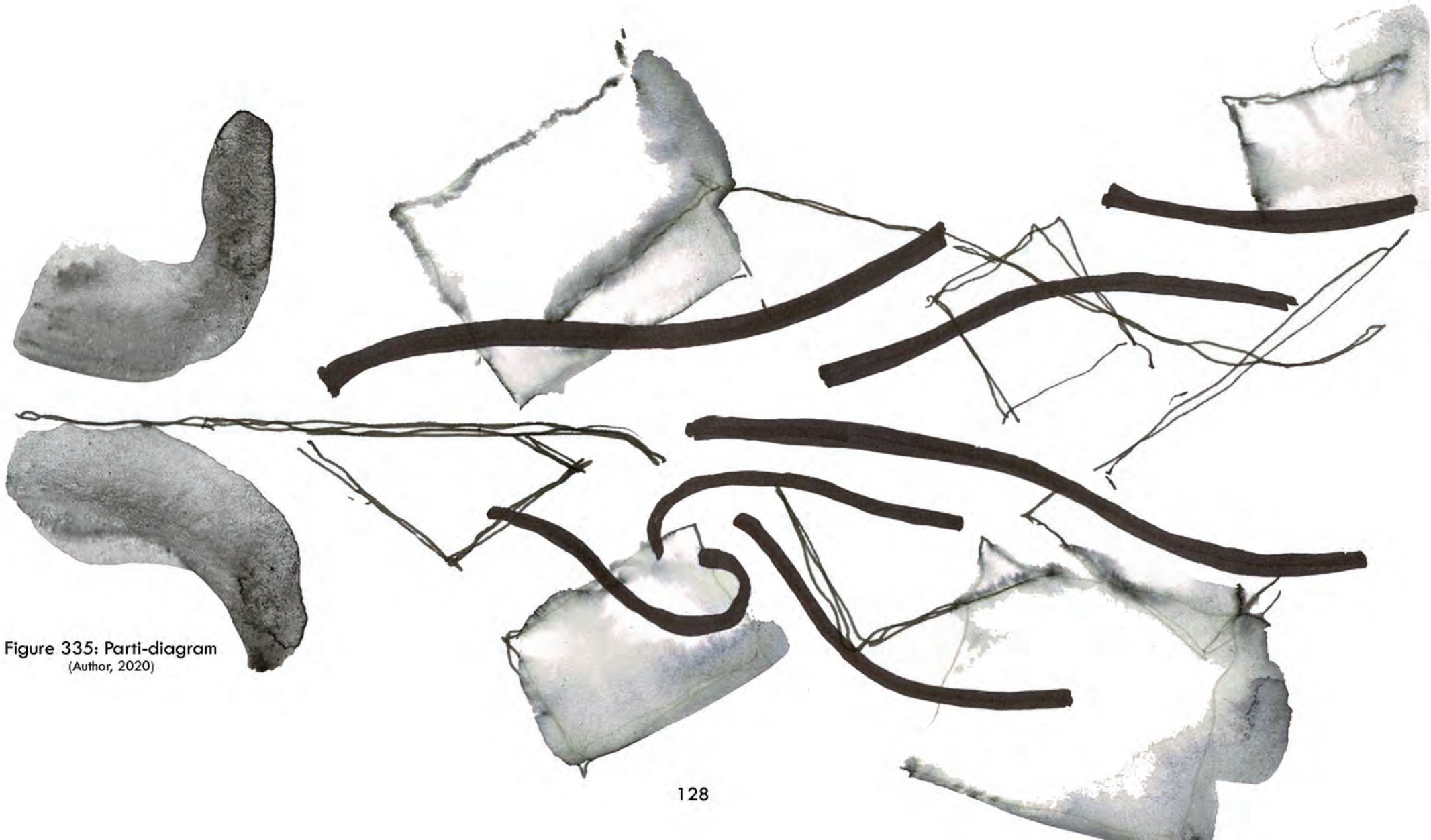
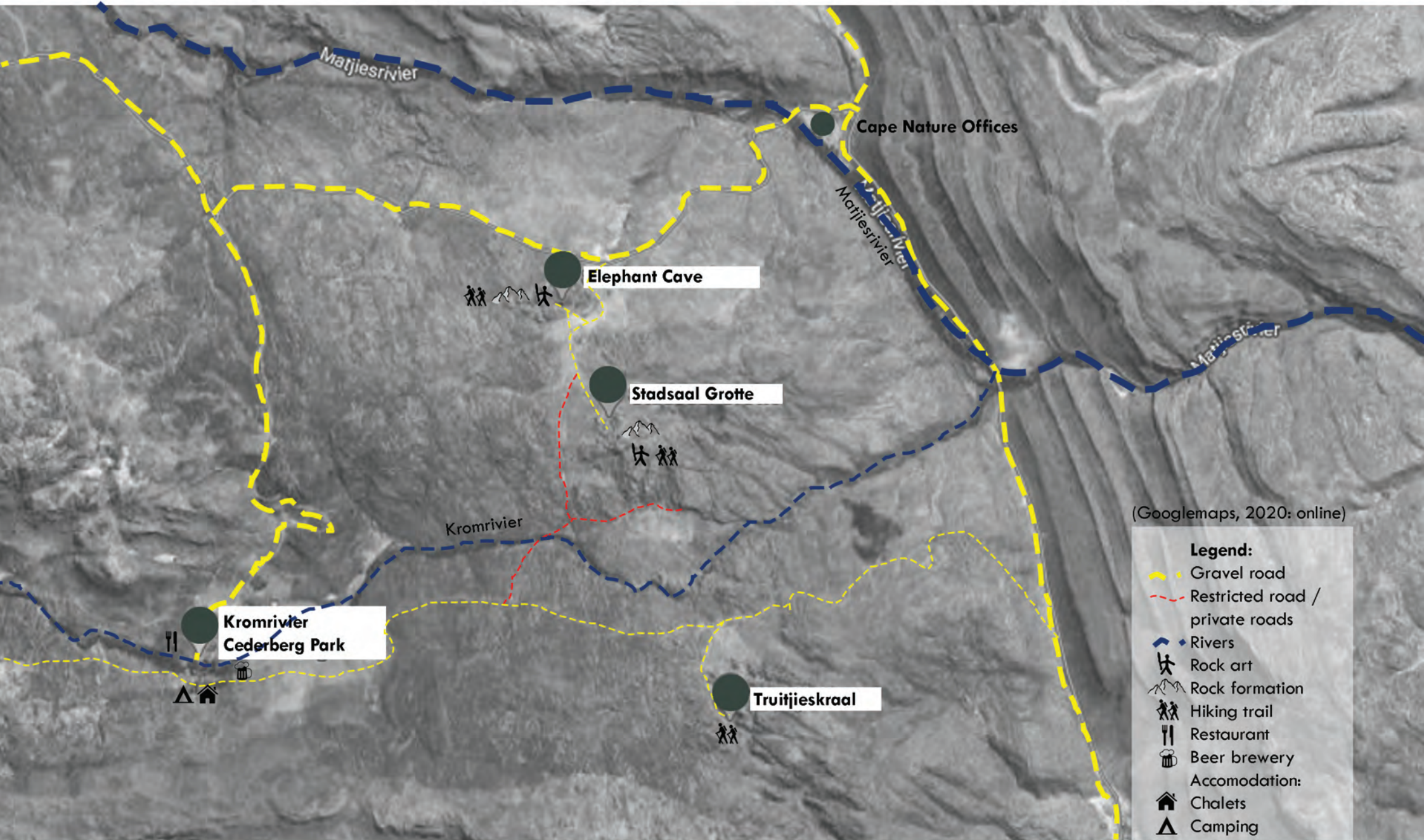


Figure 335: Parti-diagram  
(Author, 2020)

Figure 336: Site analysis



**Location:**

The proposed site is in the Cederberg between two caves, namely the Elephant cave and the Stadsaal cave. Refer to Figure 336 and 337. The Stadsaal cave consists of one main 'stadsaal cave', which is bigger than the other series of caves around it.

**Climate:**

Very harsh climatic conditions are experienced in the Cederberg, it is either very hot or very cold.

The Cederberg is situated in a Mediterranean climatic zone. Cold and wet winters with hot and dry summers are to be expected. Temperatures during winter can be as low as  $-5^{\circ}\text{C}$  and in Summer it can be more than  $30^{\circ}\text{C}$ . North-Westerly winds occur during the Winter months and in Summer the South easterly winds will rise (van Rooyen, 1999). Thunderstorms as well as frost can also be expected.



(Google maps, 2020: online)

Figure 337: Proposed site

Vehicular road that will become a foot path to the stadsaal cave to limit the vehicular access to the site that harms the vegetation.

### Form and function:

An interpretation centre to create awareness among the environment is proposed to evidentially create a being of care. Refer to Figure 339.

As discussed extensively in the document, the morphology of the proposed design is inspired by the surrounding geomorphology.

The proposed design will be able to accommodate 120 occupants if all spaces are in use.

Operating hours will be from 09:00 until 18:00. Delivery was quite the challenge because of the unique site and the way the building is placed on the site. There is no other path than to handle the deliveries through the entrance. Therefore, it was decided to only allow deliveries between 07:00 and 08:00 in the morning to prevent the visitors and delivery staff from crossing paths.

Refuse will be placed in the refuse holding area and at the end of each day it will be moved to the refuse area that is farther away from the entrance and closer to the road for easy access to remove it from site. Refer to Figure 338.

Private and semi-private spaces are in the middle of the proposed scheme, wrapped in thick walls to allow the public spaces to live out to the landscape. The aim is to blur the edge threshold between inside and outside for an experience to still be in the landscape. Refer to Figure 340 and 341.

Staff rooms for the admin and kitchen staff as well as the cleaning staff are located separately and overlooks the landscape.

The following tables will describe and explain how the spaces would operate in the proposed design:

Building footprint = 1630m<sup>2</sup> (main building) + 690m<sup>2</sup> (accommodation) = 2320m<sup>2</sup>

Enclosed spaces = 555m<sup>2</sup> (main building) + 335m<sup>2</sup> (accommodation) = 890m<sup>2</sup>

Outside space under roof = 1075m<sup>2</sup> (main building) + 355m<sup>2</sup> (accommodation) = 1430 m<sup>2</sup>

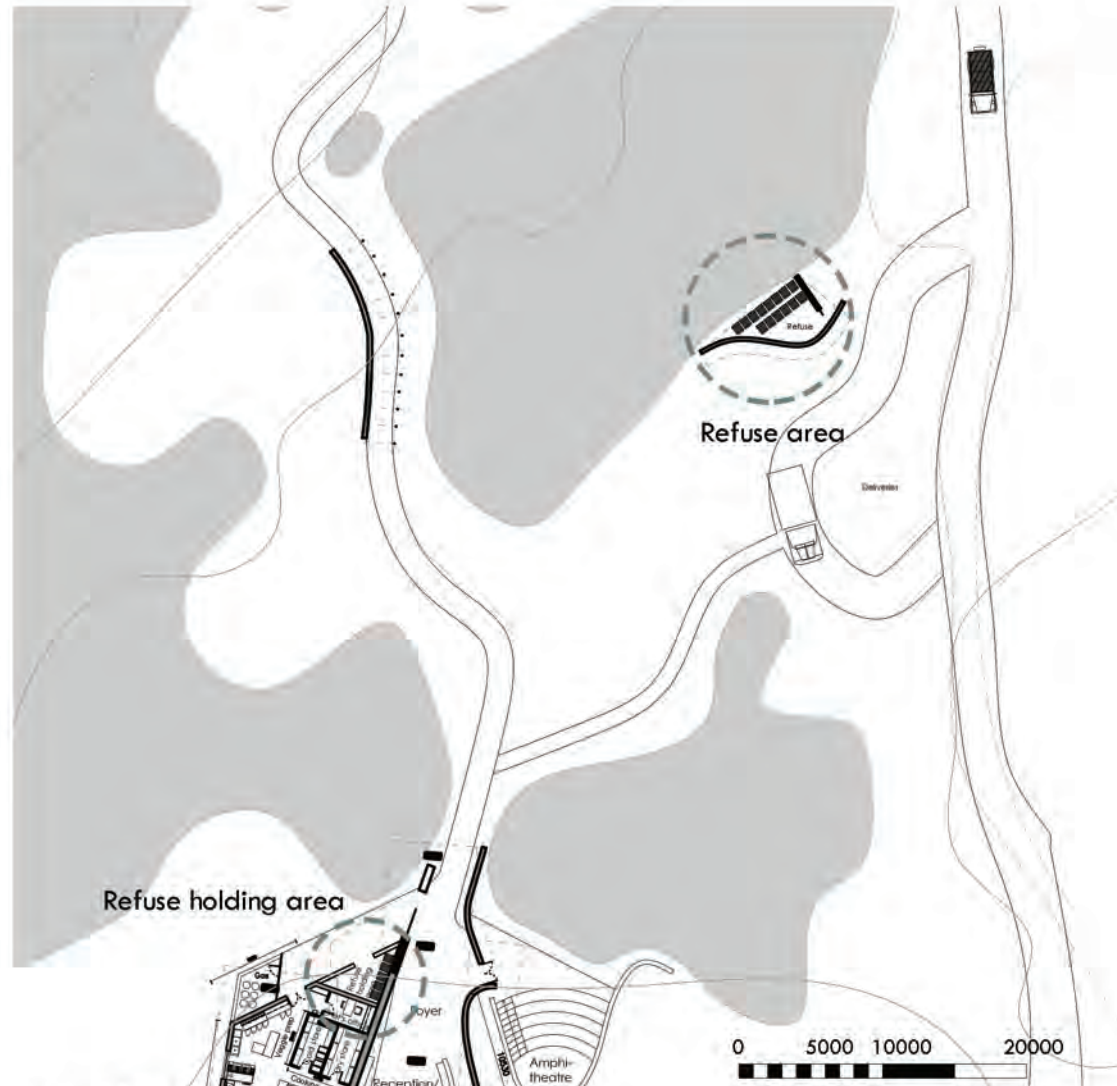
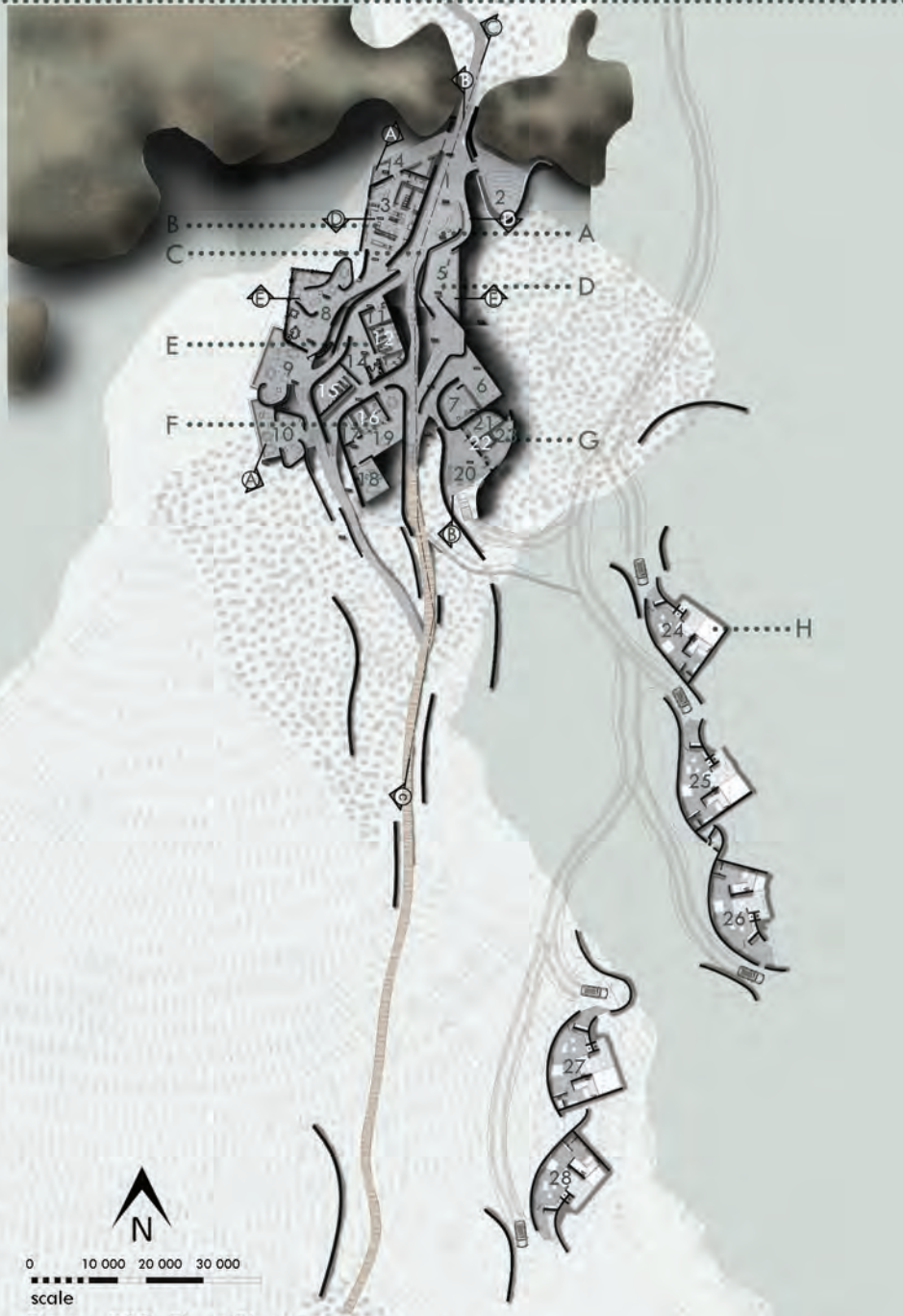


Figure 338: Refuse plan  
(Author, 2020)



**A - Entrance**

- 1 - Reception and small shop

**B - Restaurant**

- 3 - Kitchen
- 4 - Service yard
- 8 - Enclosed restaurant pod
- 9 - Open restaurant pod
- 10 - Open restaurant pod

**C - Walking trail to Stadsaal caves**

**D - Interpretation space**

- 2 - Amphi-theatre
- 5 - Interpretation space
- 6 - Cedar tree/fynbos shop
- 7 - Cedar tree research room

**E - Ablutions**

- 11 - Battery room / Store room
- 12 - Ladies WC
- 13 - Store room
- 14 - Universal WC
- 15 - Men's WC

**F - Admin space**

- 16 - Offices
- 17 - Store room
- 18 - Staff room
- 19 - Meeting / lunch space

**G - Service Yard**

- 20 - Service yard
- 21 - Laundry room
- 22 - Store room
- 23 - Staff room

**H - Accomodation**

- 24 - Unit 1  
Bobbejaangesigie
- 25 - Unit 2  
Roostompie
- 26 - Unit 3  
Aasbossie
- 27 - Unit 4  
Geelmagriet
- 28 - Unit 5  
Speldekussing

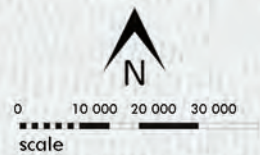


Figure 339: Floor Plan



Room data sheets:	
Interpretation space:	
Room name	Reception
Net room area	110 m <sup>2</sup>
No of rooms	1
Hours of operation	08:00 – 18:00
Occupancy	visitors
Description	The reception will welcome any visitors and guide them where to go, whether it is to the interpretation space, stadsaal caves, restaurant or accommodation.
Special requirements	Permits to any site in the Cederberg will be sold here as well as the stadsaal cave.  The small shop will sell local products such as: Wine from the Sanddrif farm Locally produced tea Locally produced beer by Kromrivier farm Olives produced by Mount Cedar etc. NA
Room name	Amphi-theatre
Net room area	69 m <sup>2</sup>
No of rooms	1
Hours of operation	08:00 - 18:00
Occupancy	30 visitors (at a time)
Description	The amphi-theatre will provide a space that overlooks the unique landscape whilst getting an informative presentation about the areas' natural environment. Things such as the geomorphology, fynbos and cedar tree as well as the rock art will be discussed.
Special requirements	NA
Room name	Interpretation space
Net room area	131 m <sup>2</sup>
No of rooms	1
Hours of operation	08:00 - 18:00
Occupancy	30 visitors (at a time)

Description	The exhibition room will exhibit information about fynbos, history of the cederberg, information about the geomorphology and geology and information about rock art.
Special requirements	Visitors will pay at reception and walk through the exhibition space of the interpretation centre, continuing with the hike towards the stadsaal cave.  Specific exhibition lights to hang from the ceiling. Custom made exhibition boards with a concrete base and glass section.
Room name	Cedar tree / fynbos shop
Net room area	30 m <sup>2</sup>
No of rooms	1
Hours of operation	08:00 - 16:00
Occupancy	10 visitors (at a time)
Description	Cedar tree and fynbos seedlings will be sold here to promote the idea of growing your own fynbos or Cedar tree.
Special requirements	Plants are also sold here. A Cedar tree can also be bought here and the visitor can physically contribute by planting a Cedar tree themselves in the Cederberg. Nursery equipment will be needed such as plant pots and soil to grow the seedlings.
Room name	Cedar tree research facility
Net room area	32 m <sup>2</sup>
No of rooms	1
Hours of operation	08:00 - 17:00
Occupancy	2 staff members
Description	A facility to do more research on the Cedar tree to prevent it from extinction.
Special requirements	Computers and file cabinets
Restaurant:	
Room name	Kitchen (Refer to Figure 342)
Net room area	110 m <sup>2</sup>
No of rooms	1

Hours of operation	06:00 - 00:00
Occupancy	8 staff members
Description	The kitchen will provide food and drink for the restaurant.
Special requirements	The kitchen consists of an office, cold store and a dry store. A cooking area and veggie prep area are set out as well as a washing up area. A bar is separate from the kitchen to prepare the drinks. Refer to Figure ??. Refer to table 1 for specific equipment
Room name	Restaurant
Net room area	258 m <sup>2</sup>
No of rooms	3
Hours of operation	09:00 - 22:00
Occupancy	The restaurant can serve about 80 persons to accommodate for large groups
Description	The restaurant will consist of 3 'pods' The first will be enclosed by a simple screen to accommodate for winter time and the other two pods will be open to the landscape.
Special requirements	NA

#### Admin space:

Room name	Staff room
Net room area	27 m <sup>2</sup>
No of rooms	1
Hours of operation	24 hours
Occupancy	12 staff members
Description	Staff can lock up their personal belongings and take their breaks in the staff room.
Special requirements	A locker for each staff member

Room name	Office
Net room area	11 m <sup>2</sup>
No of rooms	2
Hours of operation	24 hours
Occupancy	1 staff member
Description	Office to do admin in
Special requirements	NA

Room name	Store room
Net room area	10 m <sup>2</sup>
No of rooms	1
Hours of operation	24 hours
Occupancy	Staff members
Description	General storage space
Special requirements	NA

#### Restrooms:

Room name	Men's restroom
Net room area	30 m <sup>2</sup>
No of rooms	1
Hours of operation	24 hours
Occupancy	4 - 6 visitors at a time
Description	Restroom facilities for any visitors or staff members.
Special requirements	3 x WC 3 x urinal 3 x whb

Room name	Ladies restroom
Net room area	22 m <sup>2</sup>
No of rooms	1
Hours of operation	24 hours
Occupancy	4 - 6 visitors at a time
Description	Restroom facilities for any visitors or staff members.
Special requirements	4 x WC 4 x whb

Room name	Universal restroom / baby room
Net room area	5 m <sup>2</sup>
No of rooms	1
Hours of operation	24 hours
Occupancy	1 visitor at a time
Description	Restroom facilities for a person with disabilities or a person wanting to change a diaper
Special requirements	Foldable baby changing table 1 x WC 1 x whb 2 x handle bars

Room name	Battery room / storage space
Net room area	13 m <sup>2</sup>
No of rooms	1
Hours of operation	24 hours
Occupancy	maintenance staff
Description	Storage space as well as a room to store the batteries for the solar panels
Special requirements	Batteries for the solar panels

Room name	Store room
Net room area	10 m <sup>2</sup>
No of rooms	1
Hours of operation	24 hours
Occupancy	Cleaning staff
Description	Storage space for any cleaning equipment or products
Special requirements	NA

## Cold room

1.1	5	1150x380	Stainless Steel 4 tier storage rack
1.2	2	895x650	Double Hoyings rack with bins
Dry store			
1.1	5	1150x380	Stainless Steel 4 tier storage rack
2.2	1	900x380	Stainless Steel 4 tier storage rack
Cooking			
3.1	2	1780x650x900	Stainless steel freezer 3 460mm Wide Doors with one height adjustable shelf per full door
3.2	1	925x805	Eloma 6 pan combi steamer with stand – 11kw
3.4	2	1780x300	Stainless Steel wall mounted double shelf
3.6	1	1200x650	Plain top table with shelf
		1200x300	– Double shelf op top
3.7	1	840x650	Splash back table with shelf
3.8	1	1200x650	Plain top table with shelf
3.9	1	1050x650	Splash back table with shelf
3.10	1	800x730	Mareno 700 - Induction cooking range
3.11	1	800x730x850	Mareno 700 - Gas 4 burner boiling table -C7-FG 8G + oven
3.12	2	400x730	Mareno 700 - Fryer 2x6lt
3.13	1	300x2800x1000	Stainless Steel service wall
3.14	1	750x450	Salamander – pass through
3.15	1	600x730x670	Mareno – 700 – work top + Base unit
3.16	1	800x730x850	Mareno – 700 Gas simmer plate + Base unit
3.17	1	800x730x850	Mareno – 700 Gas fry top – ½ Ribbed
3.18	1	600x730x670	Mareno – 700 Work top + Base unit
3.19	1	520x375	Microwave oven
Veggie prep			
4.1	1	1780x650x900	Stainless steel freezer 3 460mm Wide Doors with one height adjustable shelf per full door
4.2	1	840x650x915	Plain Top Table with Shelf
4.3	1	1830x650	Veg prep sink bowls LHS
4.4	1	1800x650	3.5 Door GN pizza back underbar fridge
4.5	1	1800x650	3.5 GN door underbar fridge SBR
			– Stainless steel back and louvre
			– 2x draw compartments
4.6	1	3600x300	Stainless Steel wall mounted double shelf

Wash up			
5.1	1	1800x650	Stainless Steel double centered pot sink
5.2	1	1840x400	Hanging steel pot rack
5.3	1	1800x600	Double dirties table with scrapehole
5.4	1	575x600	Winterhalter single bowl inlet table
5.5	1	900x600	Stainless Steel single bowl inlet table
5.6	1	716x740	Hood type dishwasher – winterhalter SO2
5.7	1	1100x600	Stainless Steel outlet table
5.8	2	550x550	Glass rack trolley
Bar			
6.1	3	1780x650x900	Plain top fridge 3.5 GD Doors with three GN <sup>+</sup> variable racking systems and LED light.
6.2	1	1000x750x1000	Ice cube machine N201M with 320 kg bin
6.3	1		Coffee grinder
6.4	1	700x530	2 Head espresso machine
6.5	1		Ice crusher
6.6	1		Milkshake machine single head
6.7	1		Hamilton beach tempest bar blender
6.8	1	1360x630	Upright fridge with sliding doors
Laundry			
7.1	1	800x530	sink
7.2	1		Industrial washer
7.3	1		Industrial dryer
7.4	1	1400	Industrial roller iron
7.5	1	1775x650	Stainless steel neutral counter SBR CW 2x s/steel undershelves, s/steel backing
7.5.1	1		Bottle irons
7.6	8	900x380	Stainless steel 4 tier storage rack

Table 1: Detailed description of equipment

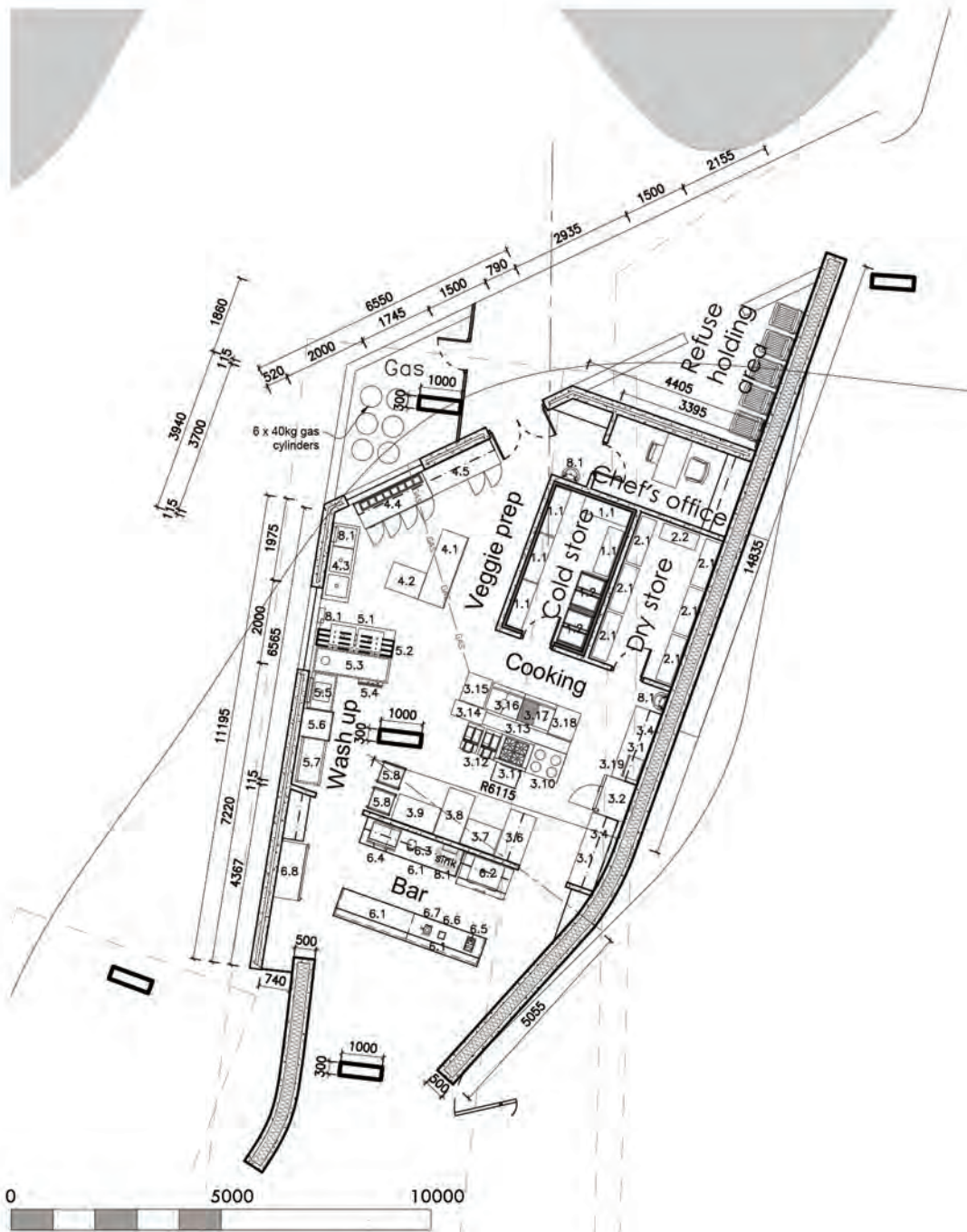


Figure 342: Detailed kitchen plan  
(Author, 2020)

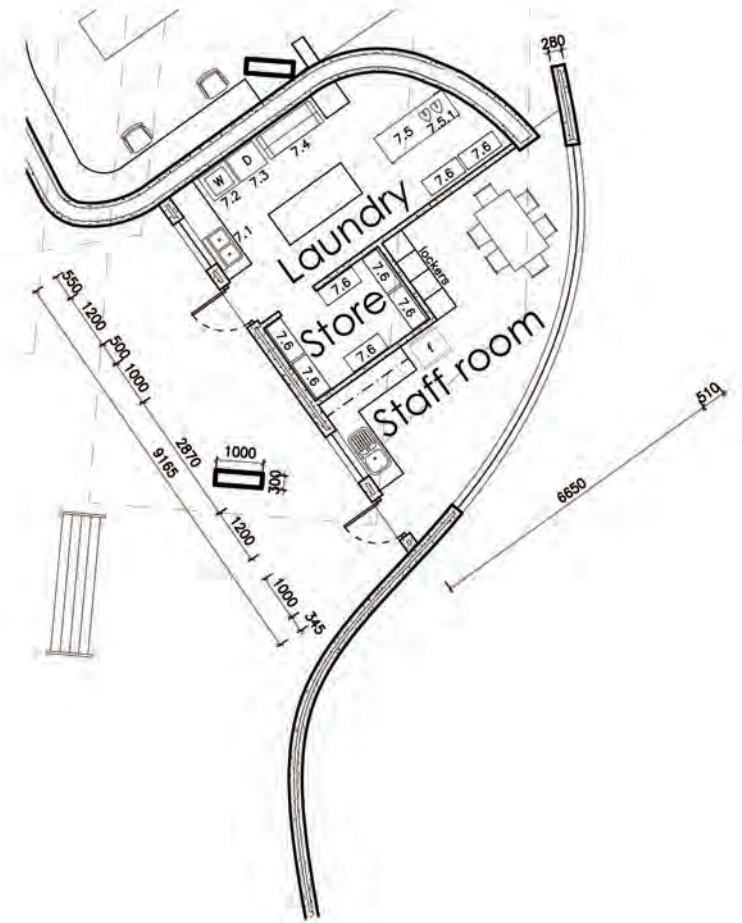


Figure 343: Detailed laundry room plan  
(Author, 2020)

Room data sheet:

**Accommodation:**

Room name	Living room
Net room area	9,5 m <sup>2</sup>
No of rooms	5
Hours of operation	24 hours
Occupancy	2 visitors, 1 cleaning staff
Description	Living room overlooking the landscape
Room name	Bedroom
Net room area	15,5 m <sup>2</sup>
No of rooms	5
Hours of operation	24 hours
Occupancy	2 visitors, 1 cleaning staff
Description	Bedroom overlooking the landscape
Room name	Kitchenette
Net room area	6 m <sup>2</sup>
No of rooms	5
Hours of operation	24 hours
Occupancy	2 visitors, 1 cleaning staff
Description	Small kitchen with a fridge and a basin to accommodate basic kitchen needs
Room name	Bathroom
Net room area	28 m <sup>2</sup>
No of rooms	5
Hours of operation	24
Occupancy	2 visitors, 1 cleaning staff
Description	A bathroom with doors that open to the outside in front of the bath and the shower. A small swimming pool is placed to overlook the landscape. A separate room for the toilet.
Room name	Outdoor space
Net room area	10,8 m <sup>2</sup>
No of rooms	5
Hours of operation	24
Occupancy	2 visitors, 1 maintenance staff
Description	Small deck with a fireplace overlooking the landscape.

**Service space for accommodation:**

Room name	Service yard
Net room area	m <sup>2</sup>
No of rooms	1

Hours of operation	24 hours
Occupancy	2 maintenance staff
Description	A service yard to handle laundry or any maintenance needed
Special requirements	Parking space for maintenance vehicle 3 x Clothing lines for laundry

Room name	Laundry room (Refer to Figure 343)
Net room area	20 m <sup>2</sup>
No of rooms	1
Hours of operation	07:00 - 19: 00
Occupancy	2 laundry staff
Description	A laundry room to wash towels and bedding of the accommodation units
Special requirements	Refer to table 2 for equipment

Room name	Store room
Net room area	6 m <sup>2</sup>
No of rooms	1
Hours of operation	07:00 - 19: 00
Occupancy	2 laundry staff
Description	Storage space to store any laundry products or linen
Special requirements	Refer to table 2 for equipment

Room name	Staff room
Net room area	24 m <sup>2</sup>
No of rooms	1
Hours of operation	24 hours
Occupancy	8 staff members
Description	Staff can lock up their personal belongings and take their breaks in the staff room.
Special requirements	8 x Lockers

## Services

The site is far from any municipal connections, therefore alternative ways had to be considered to deal with services.

### Electricity:

The proposed design will make use of electricity that is generated by solar panels. A small solar farm will be located behind a rock bed to prevent the visitor from seeing them. Refer to Figure 345.

The power will be stored in Lithium batteries. The main battery room will be located in the restrooms section and a sub-battery room will be located near the accommodation units because it is much farther. Refer to Figure 344.

Gas will also be used, especially for kitchen appliances and to generate hot water. The storage space for the gas bottles are located near the entrance, where deliveries also takes place.

- The kitchen will make use of 6 x 40kg gas bottles
- And the accommodation units will have 2 x 9kg bottles each.

The decision to have two 9kg bottles at each unit is to prevent running out of gas. If the one bottle empties, the system will automatically switch to the second.

### Hot water:

Rinnai is a company that specialises in hot water gas geysers.

For the kitchen, a 26-litre internal gas geyser will be used to supply hot water. The accommodation will also use a 26-litre gas geyser but it will be mounted externally. The restrooms will use the 20-litre gas geyser.

### Specifications:

26 litre (externally mounted)

- Height: 571mm
- Width: 356mm
- Depth: 202mm

26 litre (internally mounted)

- Height: 530mm
- Width: 350mm
- Depth: 194mm

20 litre gas geyser

- Height: 571mm
- Width: 356mm
- Depth: 202mm

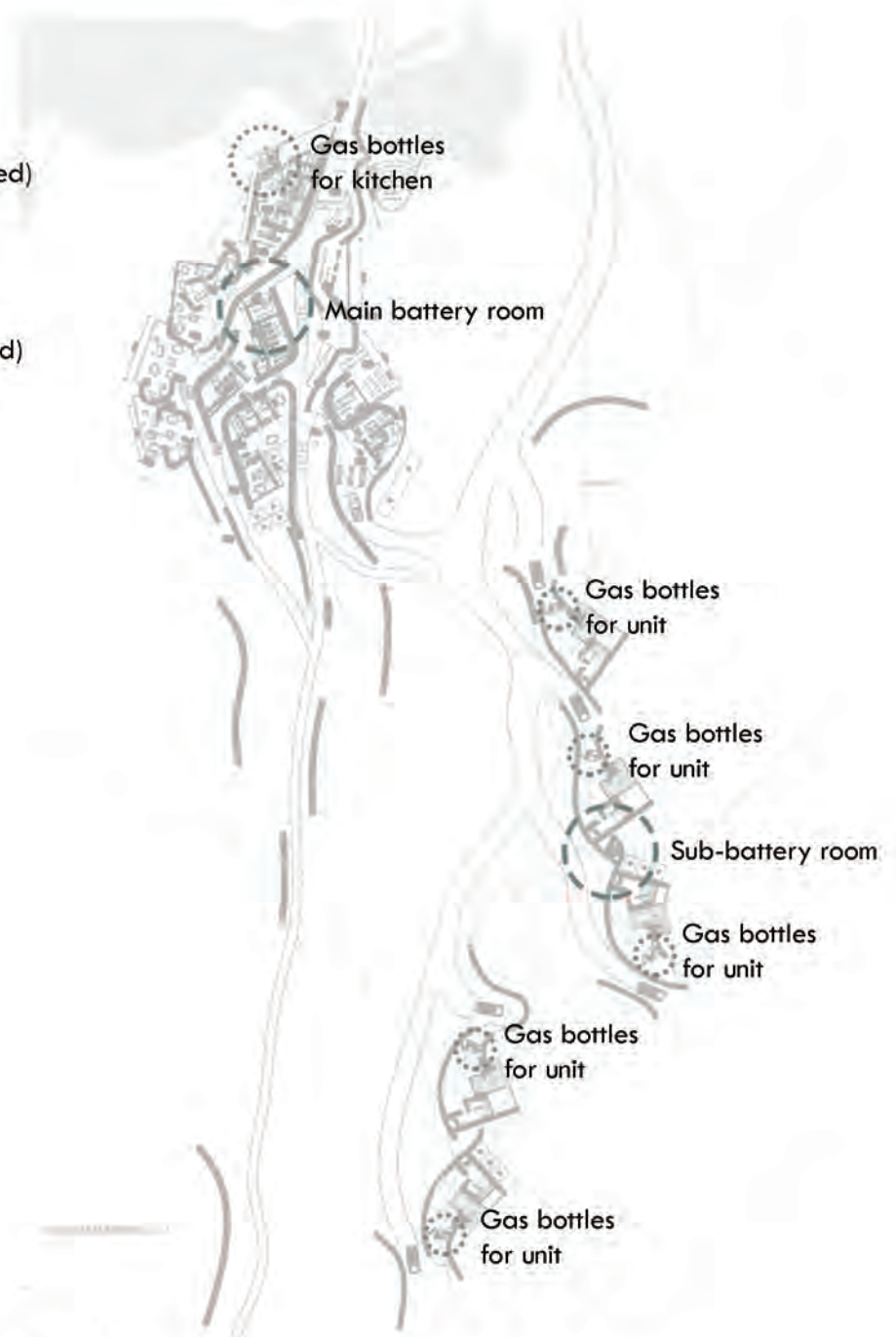


Figure 344: Battery rooms  
(Author, 2020)

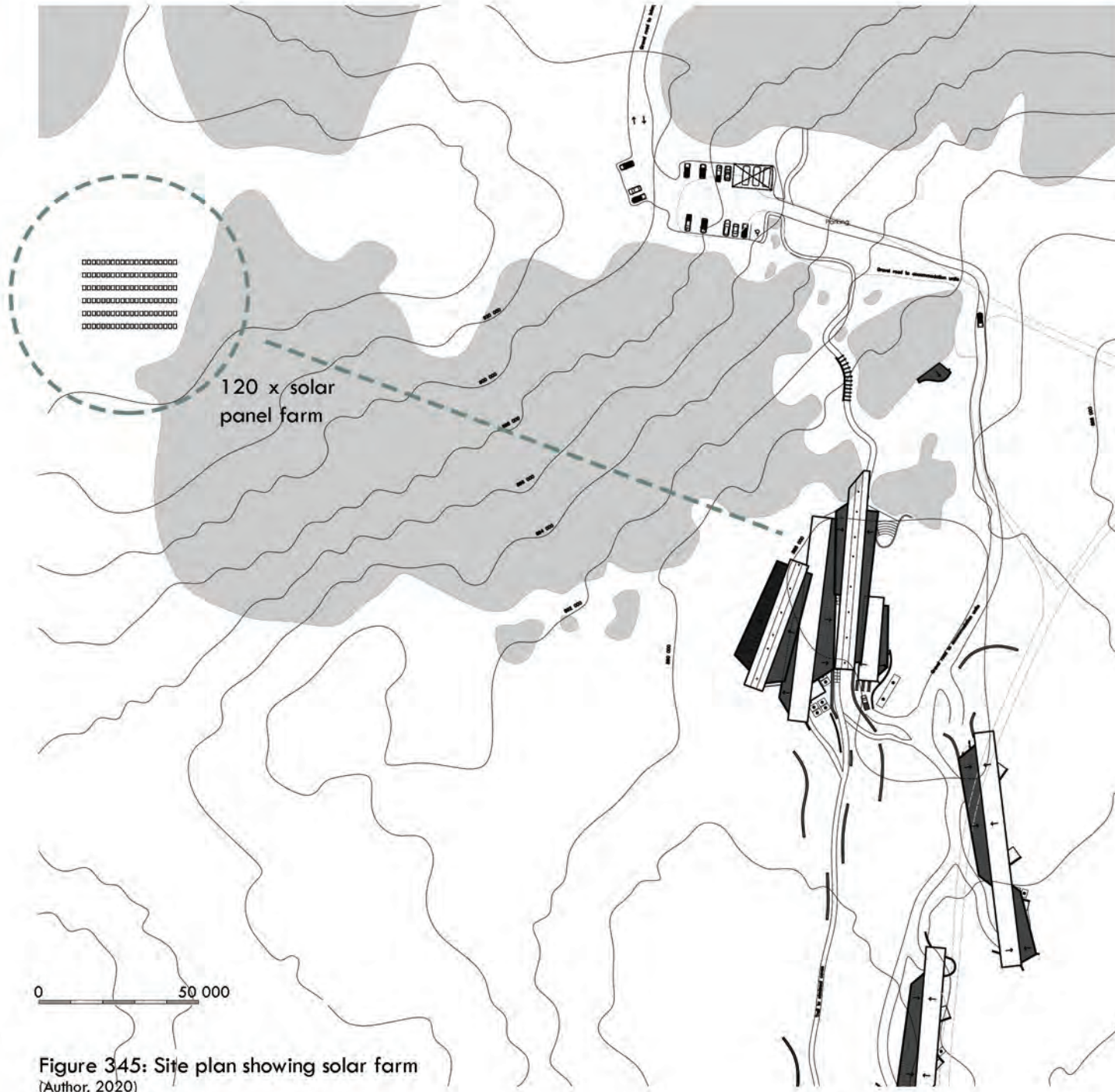


Figure 345: Site plan showing solar farm  
(Author, 2020)

## Water:

A borehole will be drilled on site to supply the proposed design with water. However, water saving principles will still be used on site as water is such a scarce element in this area.

Two separate systems will handle the wastewater and the rainwater.

The proposed design will be fitted with an Kyasol Klaro E professional multi-tank to deal with wastewater/ blackwater. Refer to Figure 346. Wastewater will run from the toilets to the underground tank. This system requires no power and works with air lift pumps to purify and circulate the water back to the toilets to be re-used. This system is a green and sustainable system that takes the environment into consideration with very low maintenance.

Specification: Klaro E: (for 42 – 50 inhabitants)

- Length: 11 100 mm
- Width: 2 200 mm
- Height: 2 710 mm
- Weight: 440 kg

A separate system will deal with the rainwater on site.

The greywater will be connected to an Kyasol Carat – S underground tank. Refer to Figure 347 and 348. Greywater is water that comes from sinks, showers, baths, and washing machines. The rainwater will be connected to the same tank. This system will actively purify and circulate it to be re-used again or to be used for irrigation purposes. This system consists of a tank, a telescopic shaft, a filter, and a pump. The tank can hold up to 130 000 liters of water and it can be expanded as often as required.

- Specifications:

- Size: 2500mm x 1800mm

- Holds 130 000 litres

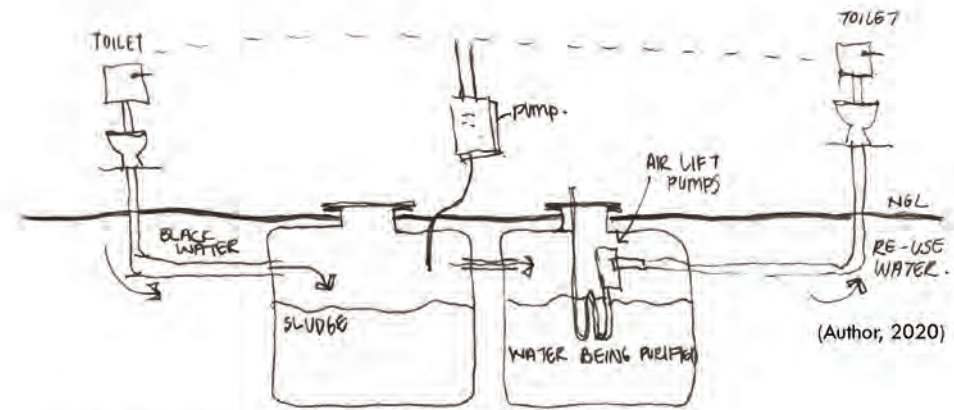


Figure 346: Black (waste) water system

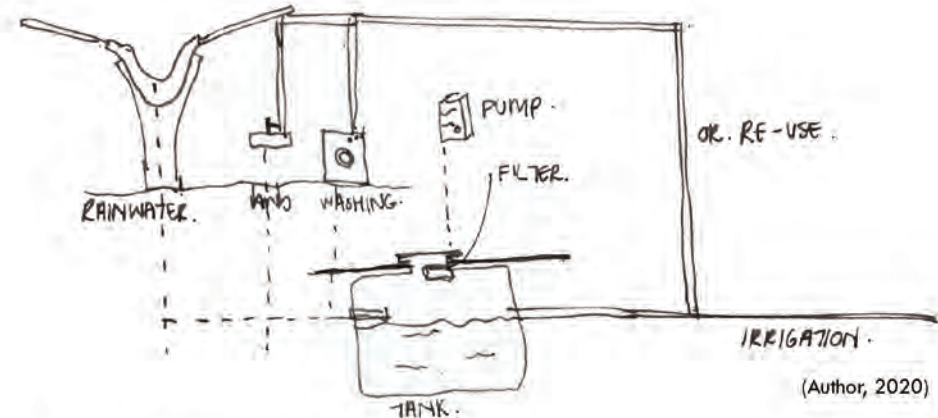


Figure 347: Greywater system



Figure 348: Rainwater harvesting

The suggestion is to have 6 tanks at the main building and 6 tanks at the accommodation units.

The aim is to let no water go to waste and to re-use the water that is available on site as it is such a scarce resource in the Cederberg.

#### Fire:

The Cederberg are prone to fires; thus, the proposed design needs to take fire breaks into consideration.

The firebreaks will apply to the National Veld and Forest Fire Act No. 101 of 1998. This act states in Chapter 4 section 13 that: "An owner who is obligated to prepare and maintain a firebreak must ensure that, with due regard to the weather, climate, terrain and vegetation of this area, a firebreak (Department of water affairs and forestry, 1999: online):"

- A. Should be wide and long enough to successfully prevent a fire from one land to the other.
- B. Should not cause soil erosion
- C. Should be free of any material that could catch fire.

However, the Greater Overberg: Rules for firebreaks, states the following: "Always take into account that some natural (or human-made) wild conditions, for example, recently burned wild (younger than 4 years), a natural Vlei, a dam or a river, old farmlands and floodplains can be regarded as a natural firebreak (Greater Overberg FPA, 2013: online)".

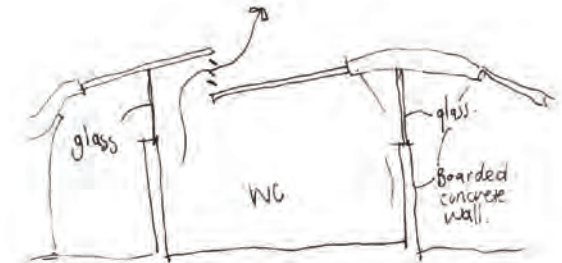
The Greater Overberg: Rules for firebreaks also mentions that areas with Fynbos/Natural Veld agricultural land interface should have a firebreak of 2.5m x height in width, which should be a minimum of 5m and the recommended method to create this firebreak should be by crop, brush cut and hoeing, which is only allowed on slopes that are less than 30 degrees (Greater Overberg FPA, 2013: online).

Referring to Figure 336, page 129, one can see that the site is located between two rivers as well as a road to the West, which act as fire breaks. Controlled fires will also take place on site in order to rejuvenate the fynbos and to prevent catastrophic fires.

#### Ventilation:

The building will naturally ventilate itself as most of the spaces are open to the outdoors. Refer to Figure 350. However, the kitchen will be ventilated mechanically.

Where the two roofs meet, space is left to insert a glass ventilation insert to ventilate the restrooms. Refer to figure 349.



(Author, 2020)

Figure 349: Ventilation in the restrooms



(Author, 2020)

Figure 350: Section showing ventilation

## Circulation:

### Universal access:

A hard surface will lead from the universal parking bay into the proposed design. There are 3 levels in the building as the site slopes about 2m. A disabled person will be able to access the restrooms and the interpretation centre comfortably on the first level. Refer to Figure 352.

If the person would choose to visit the stadsaal caves, the steps will comply with the SANS and will only be 100 mm high, thus the wheelchair will be able to go down the steps. Through the interpretation space, there is also a ramp that joins with the main route.

### Vehicular

A new entrance road is proposed to approach the building. When approaching the parking lot, one will constantly be exposed to rock formations along the way. Refer to Figure 351.

The parking lot will be very informal, a dedicated bus stop area for larger groups of tourists will be set out. These busses will be smaller off-road busses, accompanying about 17 people, to access the site comfortably. Refer to Figure 351.

The existing vehicular road on site will be left to be restored by itself. A less invasive approach is suggested by having a hiking trail to the stadsaal caves, from the interpretation centre, rather than a road. This will also aid the process to limit vehicular access to the site.

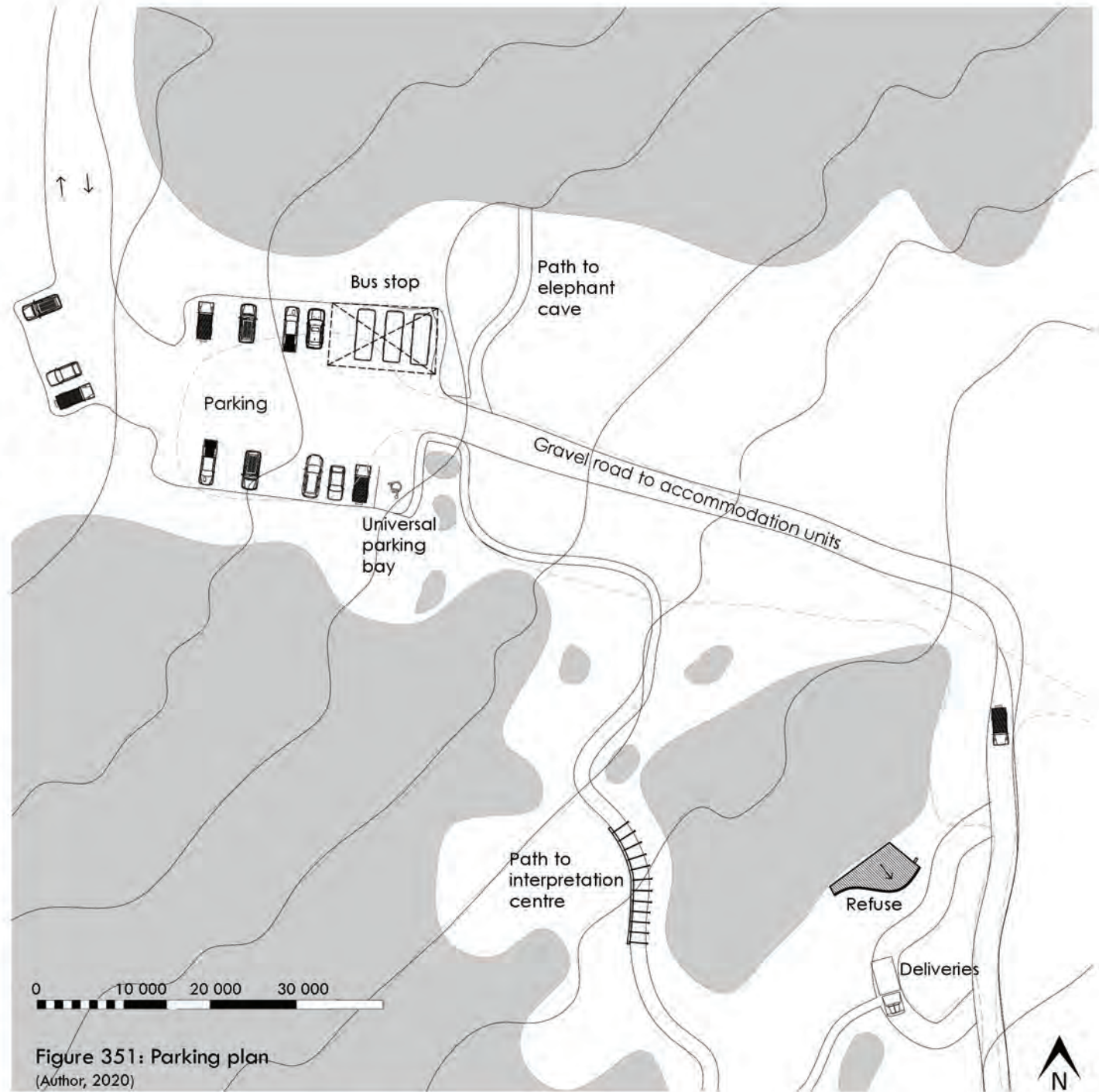


Figure 351: Parking plan  
(Author, 2020)

Upon arrival, the visitor will have the opportunity to visit the elephant cave and appreciate the magnificent view over the landscape from above as well as the rock art that the elephant cave has to offer. Thereafter, the visitor can continue towards the interpretation centre.



Figure 352: Universal access plan  
(Author, 2020)

## Pedestrian

As mentioned before, the conceptual approach towards the circulation is to have one main path that leads from the parking towards the stadsaal cave. Leading from this main route, numerous paths will lead that is inspired by the geomorphology. Refer to figure 353.

The visitor will park in the designated parking area and take the route towards the interpretation centre. The parking area will be hidden behind the rocks, when the visitor exits the building, they will still be exposed to only a natural environment.

The visitor will have three options to choose from when entering the building; visiting the interpretation centre, visit the stadsaal cave or visit the restaurant.

### 1. Visiting the interpretation centre

If the visitor decides to visit the interpretation centre, they should report at reception. An introduction about the Cederberg and its vegetation will be given at the amphi-theatre that overlooks the landscape. Next, the interpretation centre can be visited, following a visit to the stadsaal caves and on their way back they can visit the cedar tree/ fynbos shop.

### 2. Visiting the stadsaal caves

If the visitor chooses to only visit the stadsaal caves, they can report at reception and pay for the permit, continuing with the hiking trail towards the stadsaal cave.

### 3. Visiting the restaurant

If the visitor is there only to eat at the restaurant, they can continue towards the reporting point and relax and enjoy the view while enjoying traditional Afrikaans meals such as a vetkoek or bobotie. If they wish to also visit the stadsaal caves afterwards, they can do so by continuing with the route that joins the hiking trail towards the stadsaal cave.

Guests that plan to stay in the accommodation units will first report at reception and continue with a road via their vehicle towards the different units. Each unit has a unique fynbos name in Afrikaans.

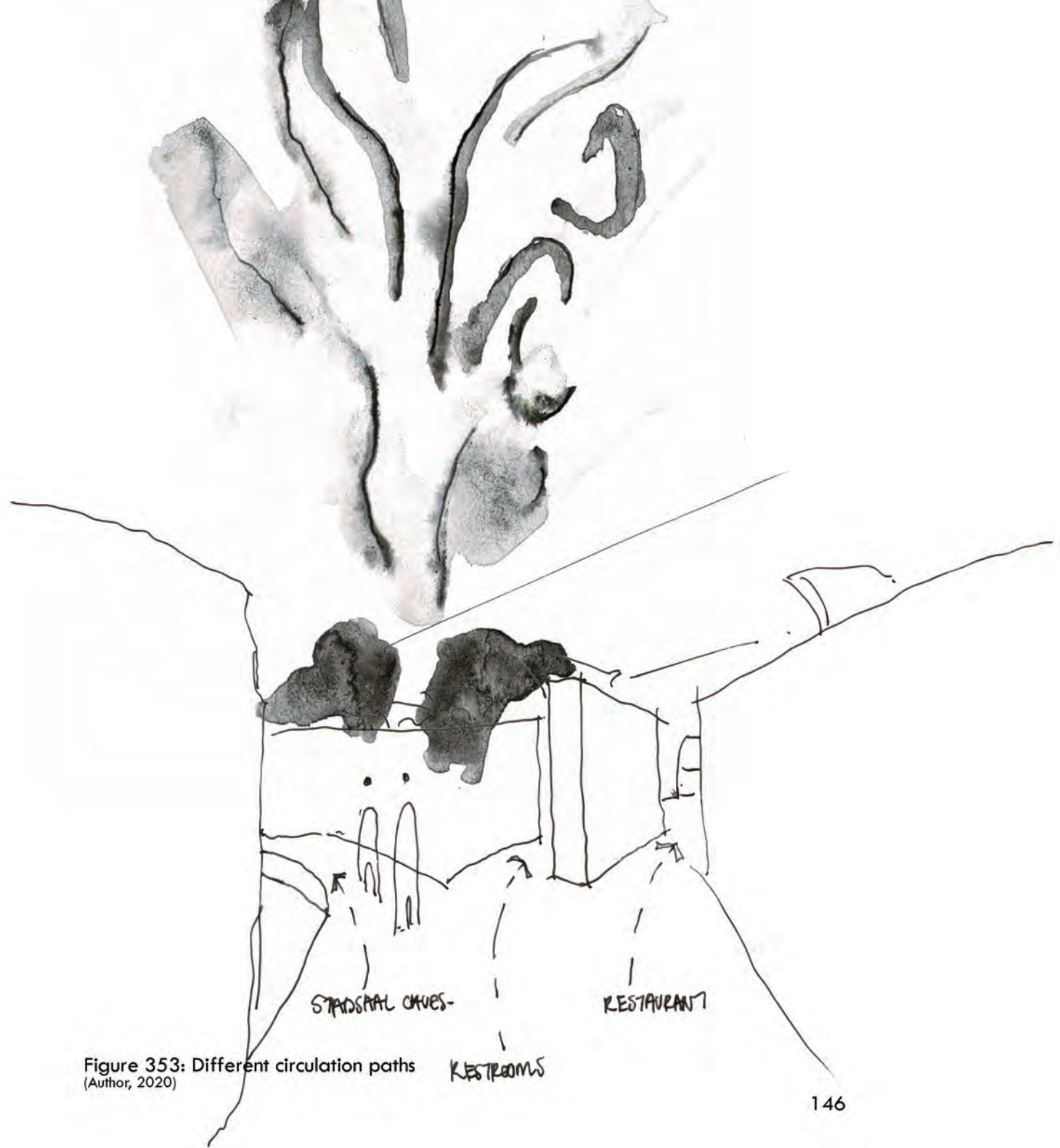


Figure 353: Different circulation paths  
(Author, 2020)

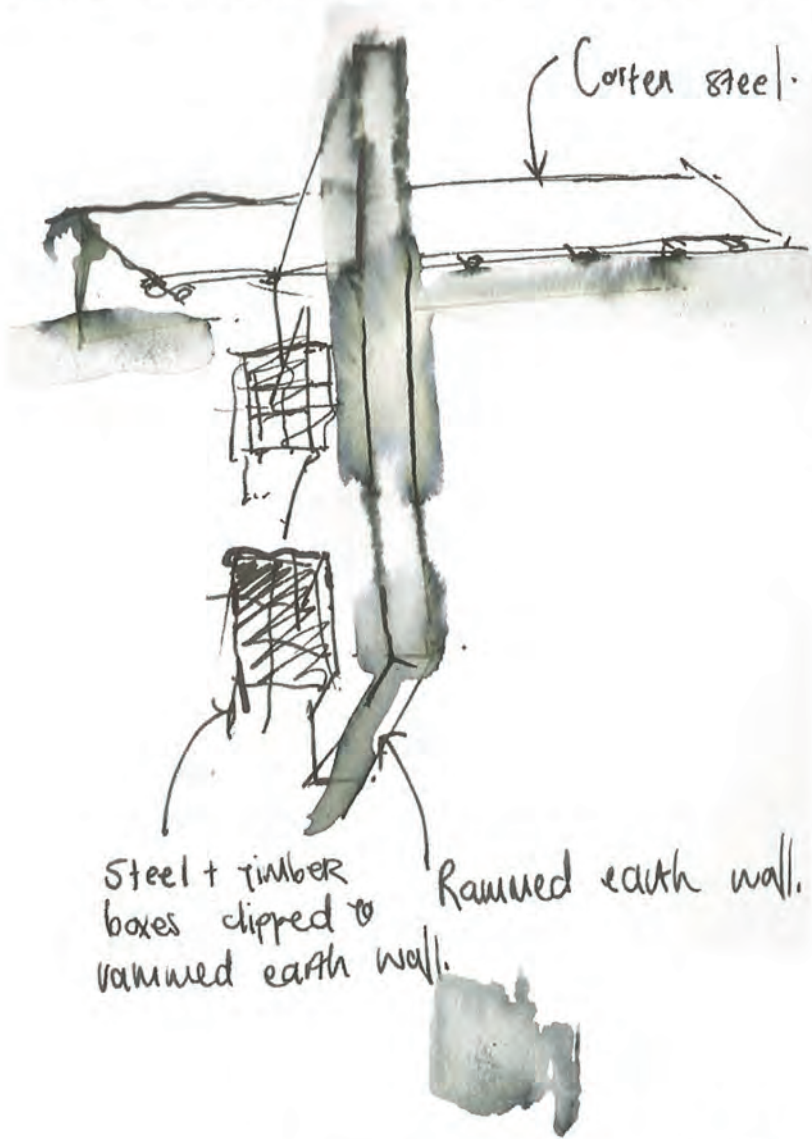
RESTROOMS

STAIRS AND CHIVES

RESTAURANT

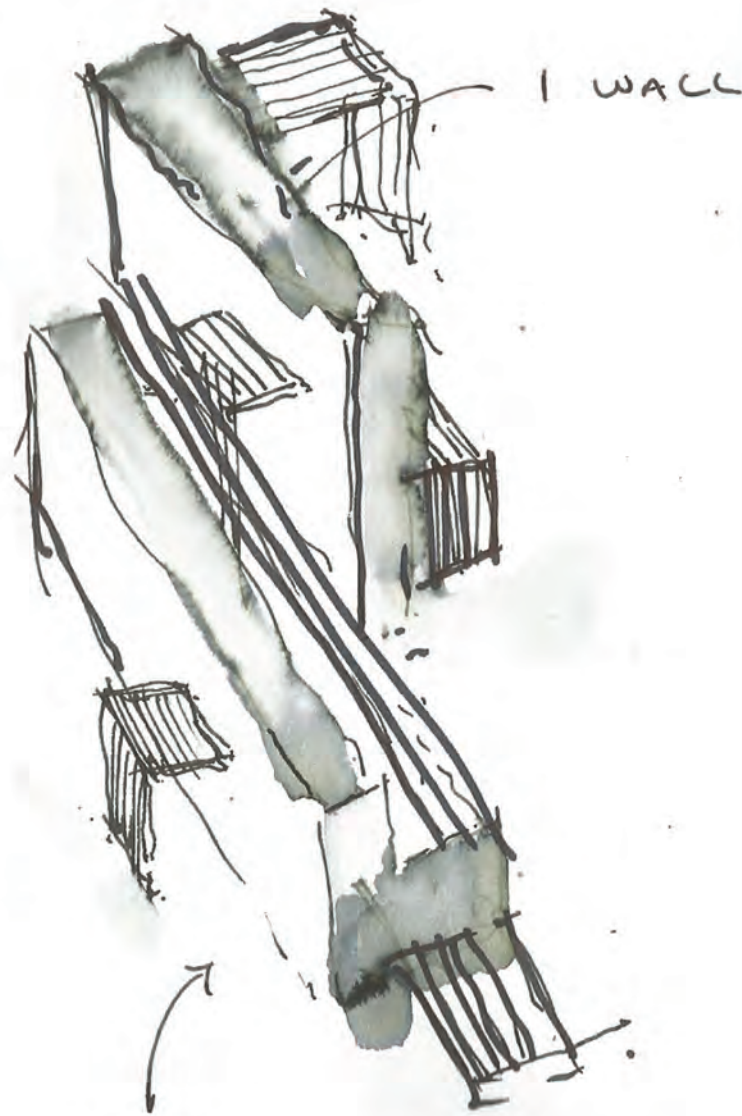
**Structure:**

The initial construction approach was to have one strong element in the proposed design and attach spaces to it. Refer to Figure 354 - 356.



(Author, 2020)

Figure 354: Initial construction sketch



(Author, 2020)

WALL 2  
Figure 355: Initial construction sketch



Figure 356: Initial construction touchstone  
(Author, 2020)

The second attempt to a structural concept was to have free formed elements that run underneath a roof structure, without touching one another. Refer to Figure 357 - 359.



Figure 357: Structural touchstone  
(Author, 2020)

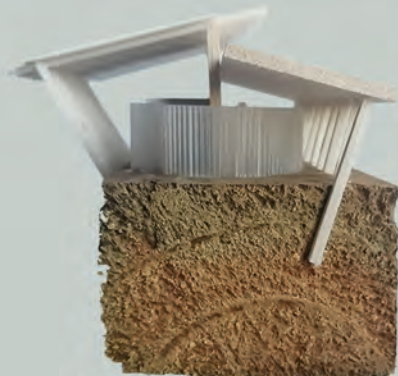


Figure 358: Structural touchstone  
(Author, 2020)



Steel framed roof spanning over spaces

Roof anchored by rammed earth wall

Square spaces under roof structure attached to main rammed earth wall.

Roof anchored in landscape

Figure 359: Structural touchstone  
(Author, 2020)

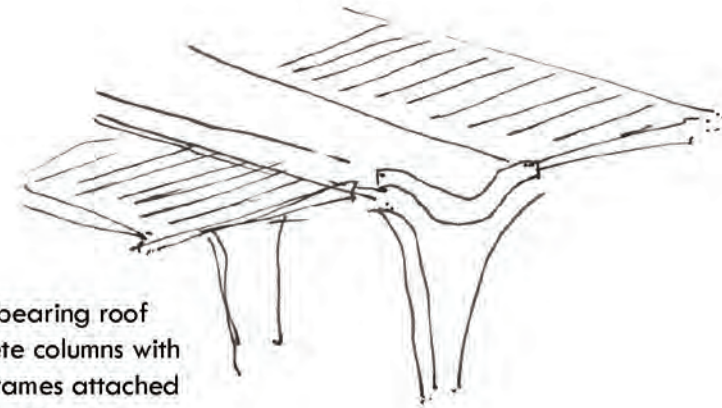
Layers in the landscape

Free formed walls creating spaces under roof structure

The balance between the fynbos and cedar tree fire experience is the inspiration towards the structural approach. The structure will consist of free formed walls underneath a self-supporting roof structure, filled in with a Corten steel screen that can slide up and down. Refer to Figure 360 and 361.

In-situ concrete columns will support a concrete gutter that will imitate a cave-like experience when moving underneath it. A steel frame structure will be attached to the concrete gutter and clad with a timber ceiling and copper roof sheeting. Refer to Figure 362.

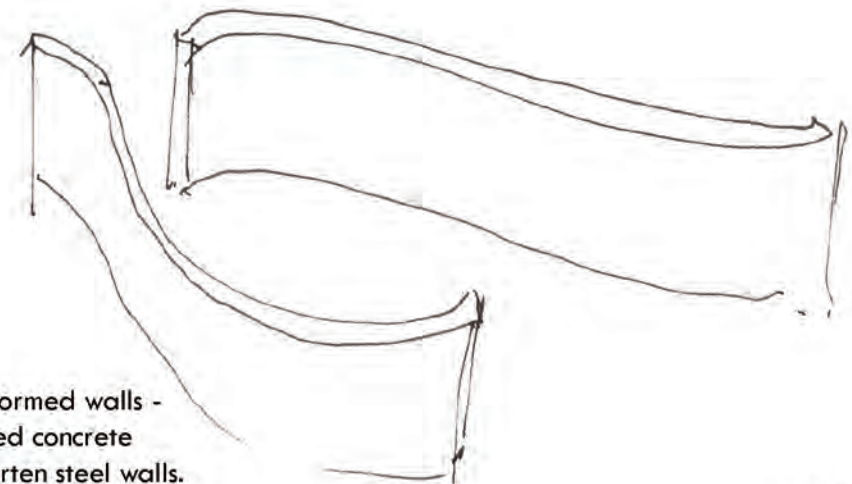
Pad foundations will support the columns and the walls with strip foundations. The walls will be made of concrete that is boarded in a wood mould that leaves the wood grain behind. This horizontal wood grain on the concrete will emphasize horizontality and movement through the proposed design.



- 1. Load bearing roof  
Concrete columns with steel frames attached to concrete.



- 3. Screen infill -  
Corten steel screens



- 1. Free formed walls -  
Boarded concrete  
and corten steel walls.

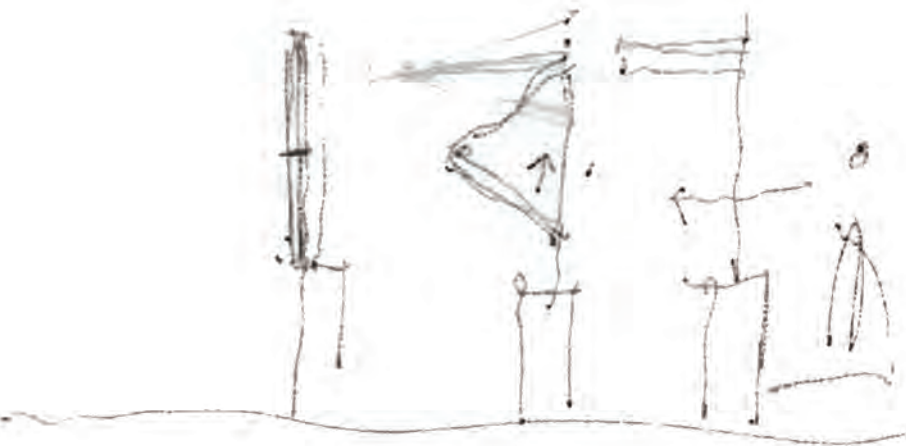


Figure 360: Foldable screens

(Author, 2020)

Figure 361: Figure ??: Structural system

(Author, 2020)

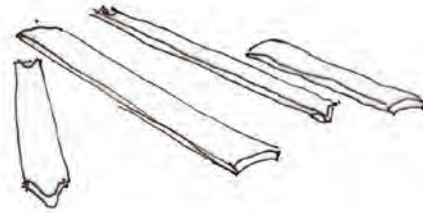
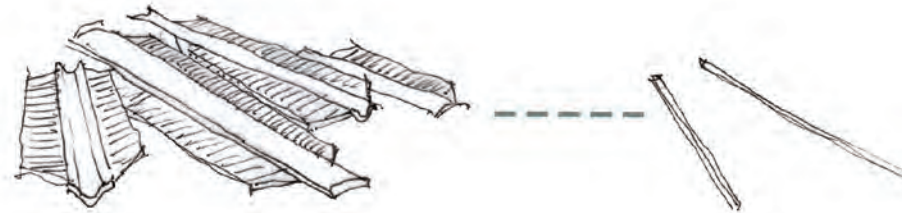
5. Steel framed roofs attached to concrete gutters with copper roof sheeting and a timber ceiling

4. In-situ concrete gutters are poured

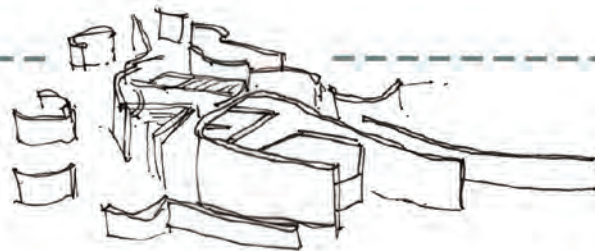
1. In-situ concrete columns with pad foundations and walls will be built on strip foundations

3. Boarded concrete walls are built and corten steel clad walls

2. Walls are built up for floor slabs to be poured



6. Sun shading screen

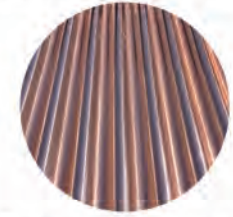


6. Glass infill



6. Glass infill between roofs to allow for ventilation

Figure 363: Materials



Copper roof sheeting



Timber ceiling



Boarded concrete walls



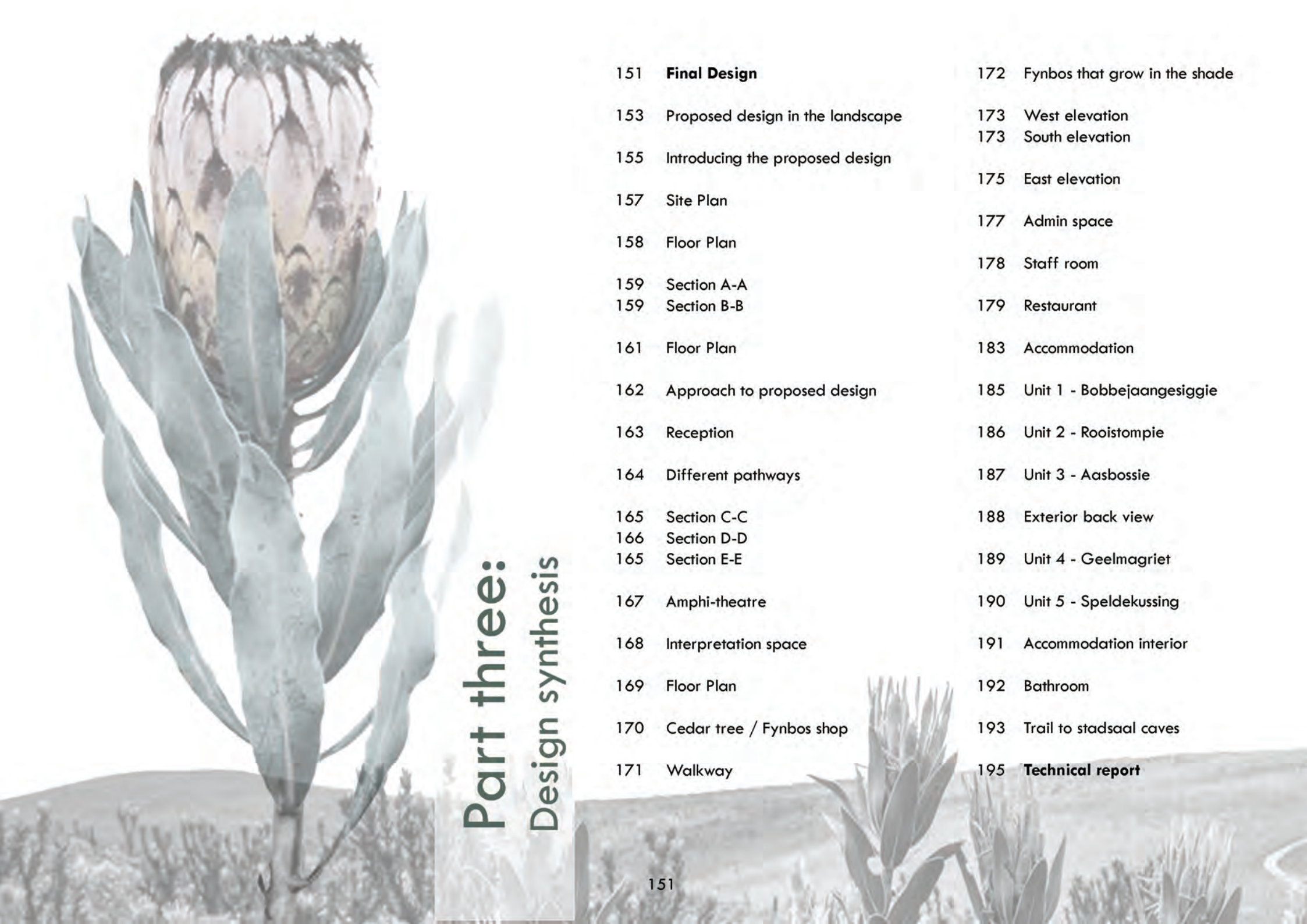
Corten steel walls



Polished concrete floors

Figure 362: Structural system

(Author, 2020)

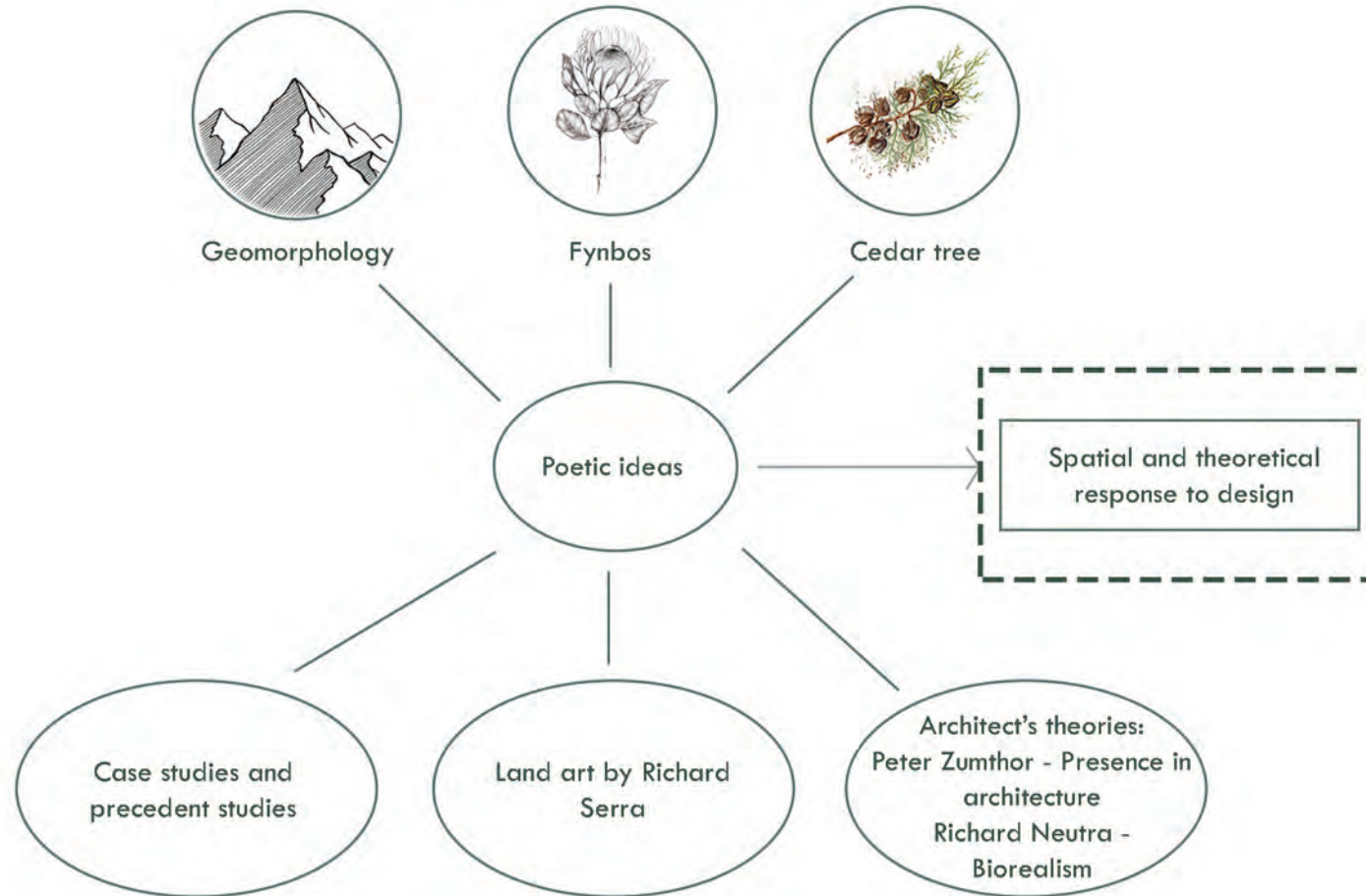


## Part three: Design synthesis

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Finally, the design will be proposed in the next section. Refer to Figure 364.

**Theoretical approach to design:**



**Figure 364: Theoretical underpinning**  
(Author, 2020)

A view of the proposed design from above, if one would look towards the stadsaal caves standing in te elephant cave. Refer to Figure 365.

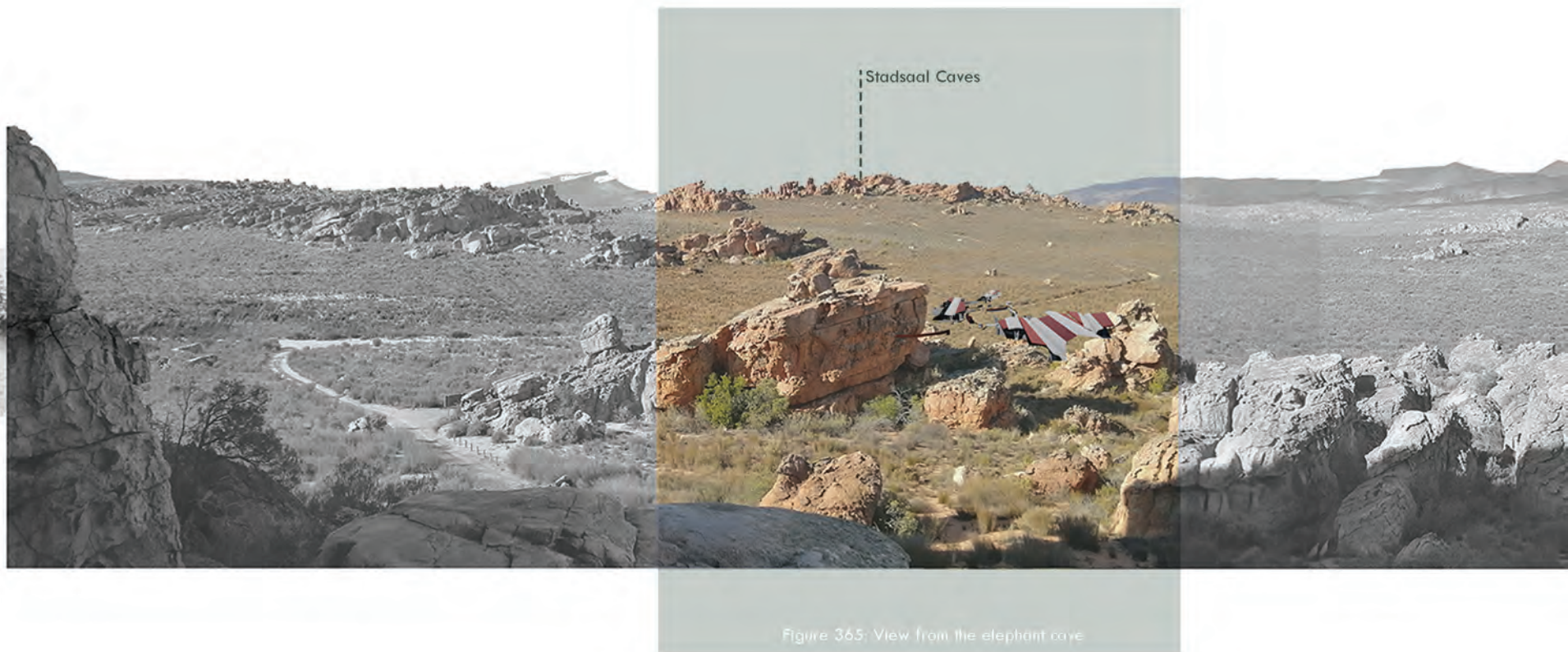


Figure 365: View from the elephant cave





## Introducing the proposed design: *Disa*

A *Disa* is a very unique and rare orchid related fynbos specie. Refer to Figure 366.1. The last time that the *Disa Longifolia* was seen, was in 2013 in the Cederberg region close to the proposed site (iNaturalist, 2013: online). The name emphasizes the broad variety of fynbos species and how important it is to conserve the vegetation. The *Disa* is only one example of hundreds that are endangered or extremely rare.

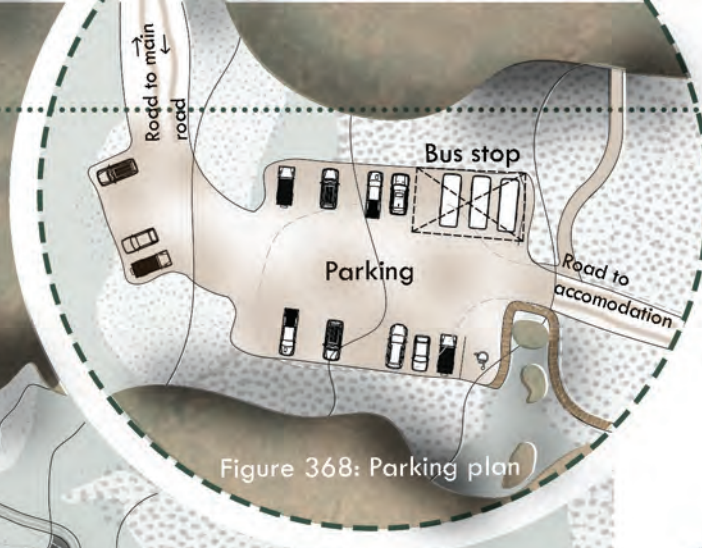
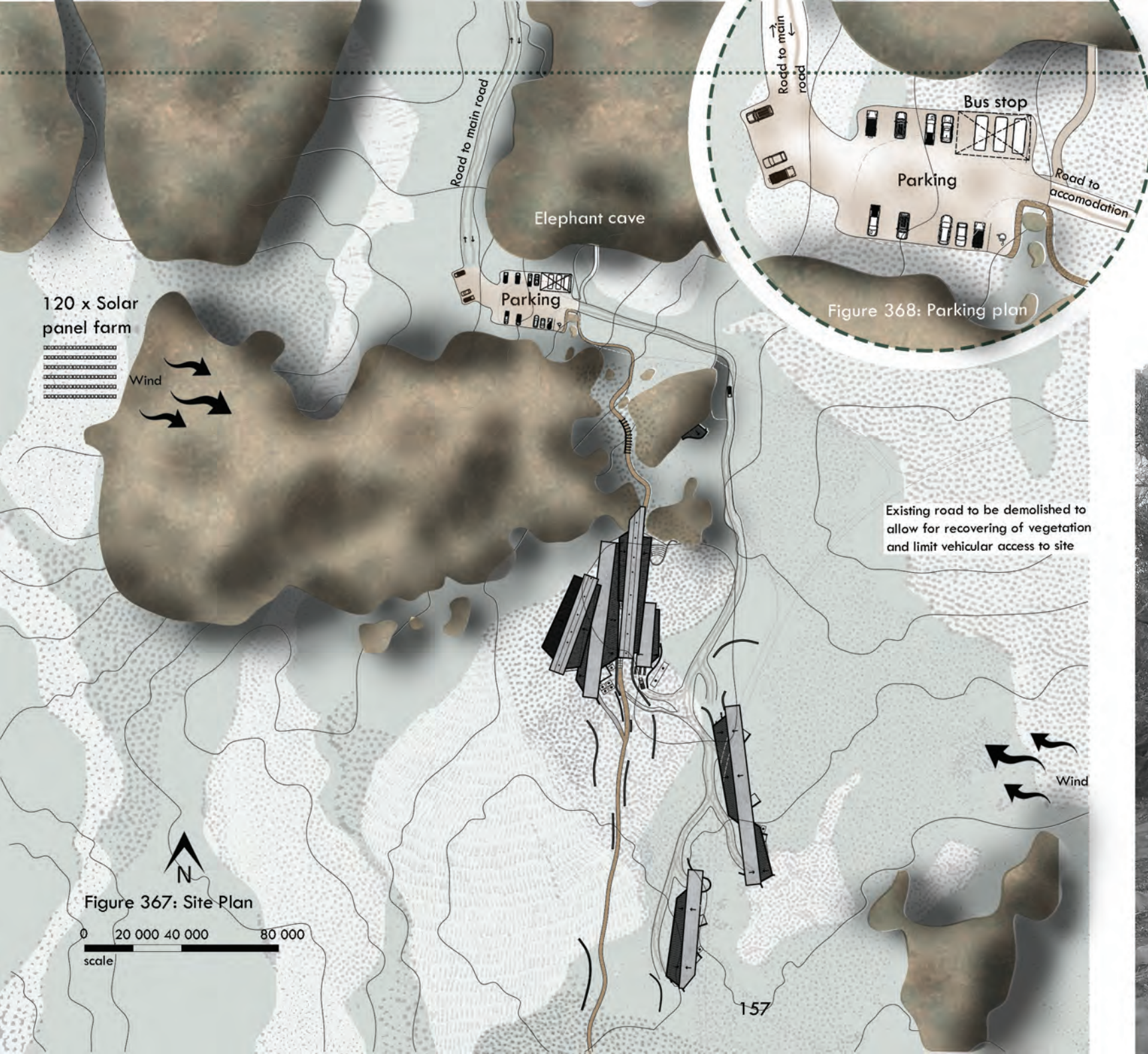
Figure 366.1: *Disa Longifolia*  
(iNaturalist, 2013: online)



Figure 366: The proposed design in context

Elephant cave |





Site Plan



# Floor Plan



## A - Entrance

- 1 - Reception and small shop

## B - Restaurant

- 3 - Kitchen
- 4 - Service yard
- 8 - Enclosed restaurant pod
- 9 - Open restaurant pod
- 10 - Open restaurant pod

## C - Walking trail to Stadsaal caves

## D - Interpretation space

- 2 - Amphi-theatre
- 5 - Interpretation space
- 6 - Cedar tree shop/nursery
- 7 - Cedar tree research room

## E - Ablutions

- 11 - Battery room / Store room
- 12 - Ladies WC
- 13 - Store room
- 14 - Universal WC
- 15 - Men's WC

## F - Admin space

- 16 - Offices
- 17 - Store room
- 18 - Staff room
- 19 - Meeting / lunch space

## G - Service Yard

- 20 - Service yard
- 21 - Laundry room
- 22 - Store room
- 23 - Staff room

## H - Accomodation

- 24 - Unit 1  
Bobbejaangesiggie
- 25 - Unit 2  
Rooistompie
- 26 - Unit 3  
Aasbossie
- 27 - Unit 4  
Geelmagriet
- 28 - Unit 5  
Speldekussing

Figure 369: Floor Plan

0 10 000 20 000 30 000  
scale

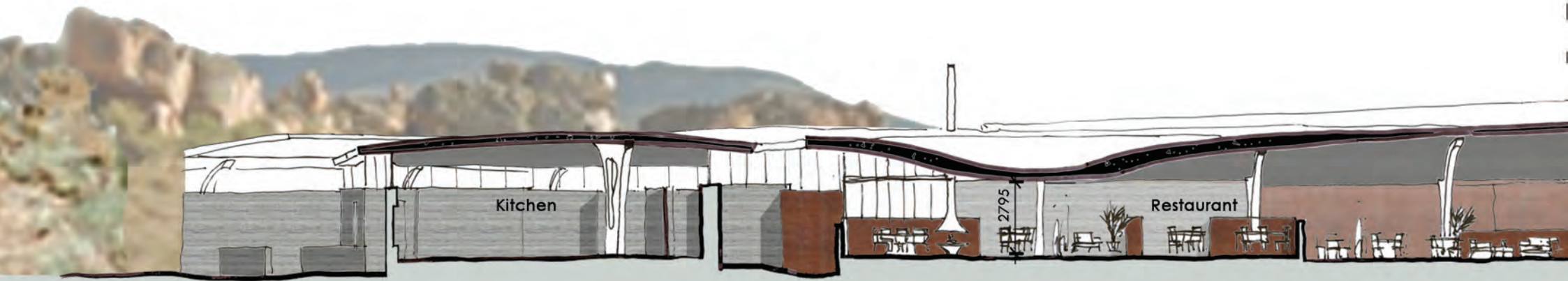
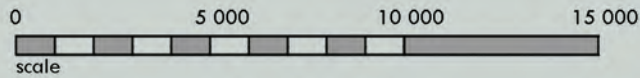


Figure 370: Section A-A



The visitor will have a unique experience moving through the different spaces and underneath the bulging concrete gutters, whilst overlooking the landscape. Refer to Figure 370 - 372.

The small shop at reception will sell local products of the Cederberg such as olives, wine, tea etc.

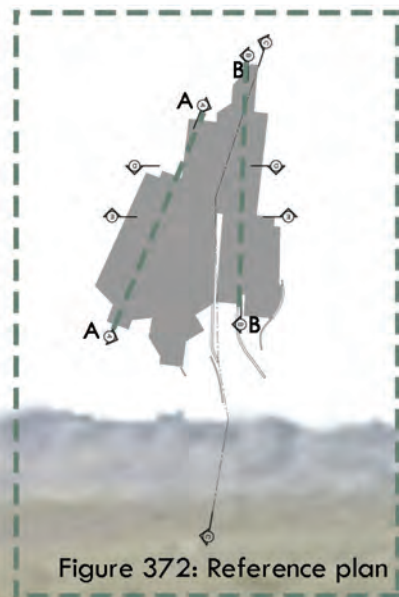


Figure 372: Reference plan

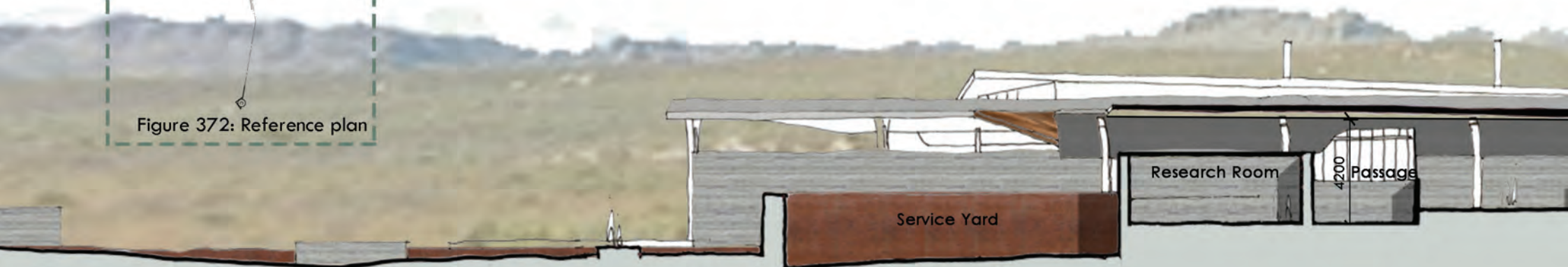


Figure 371: Section B-B

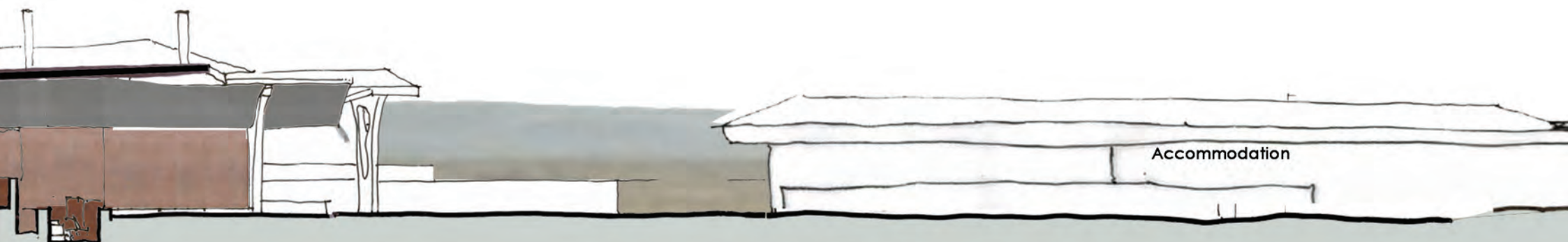


Figure 373:  
Floor Plan  
scale 1:200

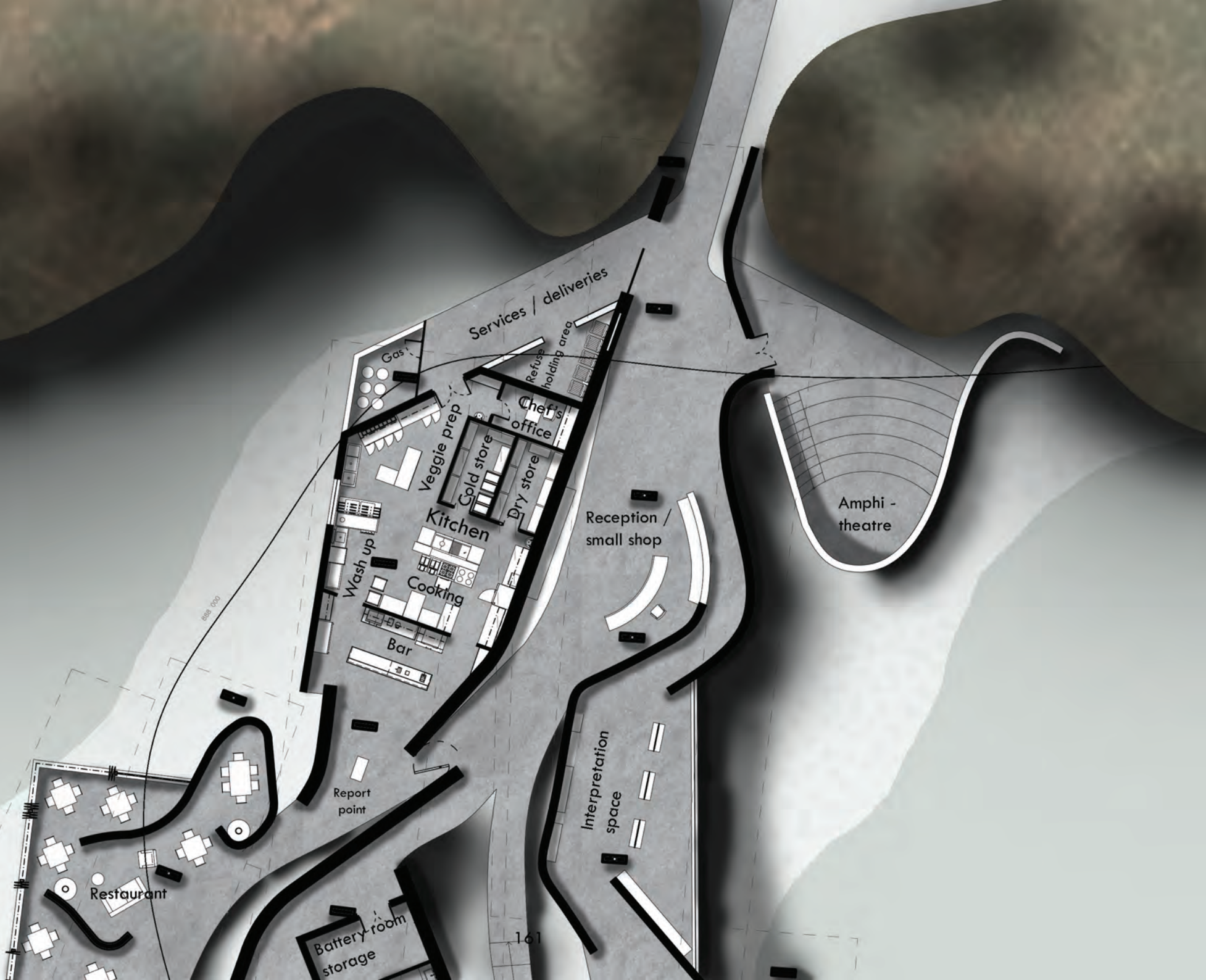




Figure 374: Approach to building

The design will be approached by a walkway that is exposed to fynbos and the natural geomorphology. The visitor will be greeted with an extended concrete gutter. Refer to Figure 373 and 374.

Fynbos species such as the Anise Buchu, Gonaqua Buchu, False Buchu and the white confetti bush are very fragrant. Refer to Figure 375 - 379. These species will be planted along the path. When the visitor would rub the leaves or brush against them with their legs, a natural scent of fynbos will occur. The Buchus are also responsible for the unique smell of Fynbos, especially after some rain.

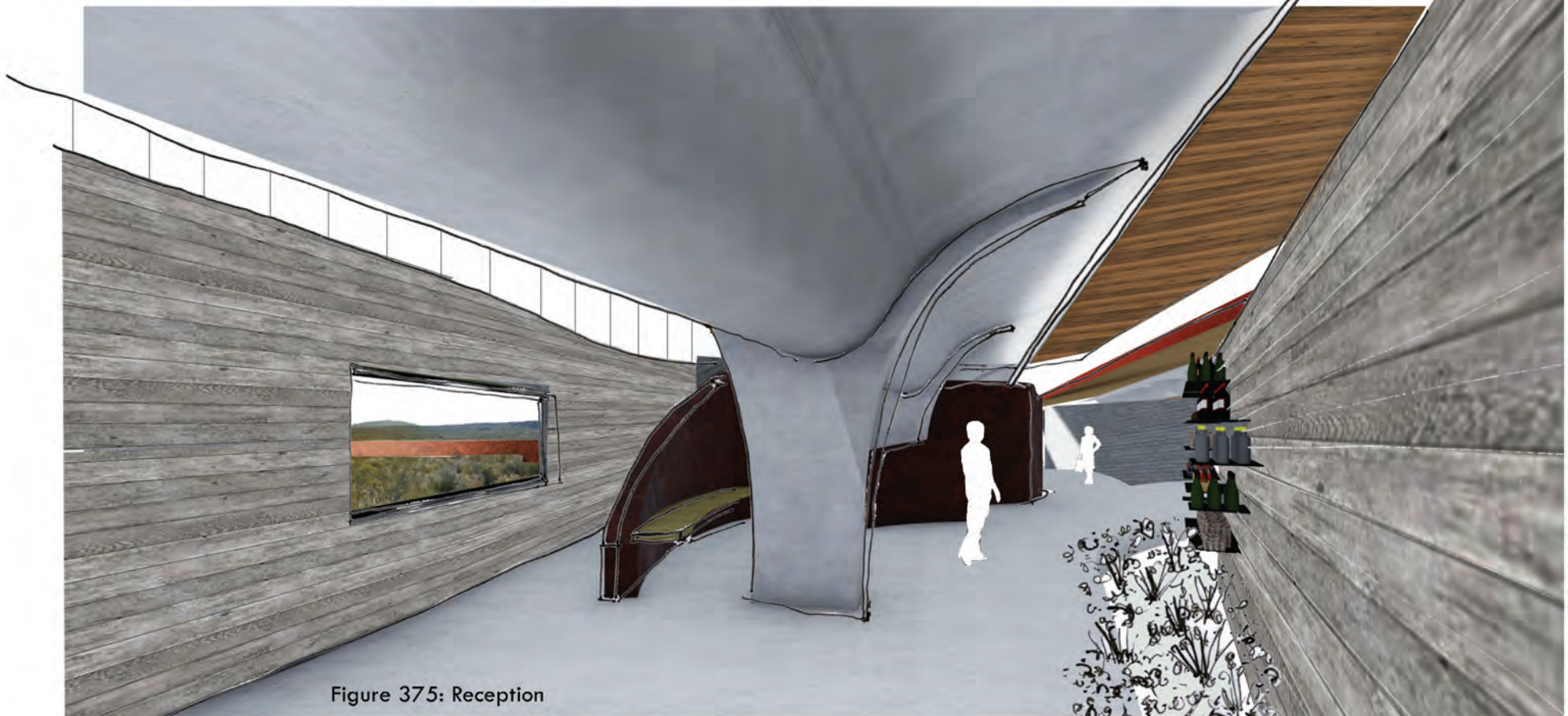


Figure 375: Reception



Figure 376:  
White confetti bush  
(Pinterest, 2020: online)



Figure 377:  
False Buchu  
(Plantinfo, 2020: online)



Figure 378:  
Anise Buchu  
(fynbos hub, 2020: online)



Figure 379:  
Gonaqua Buchu  
(iSpot, 2020: online)

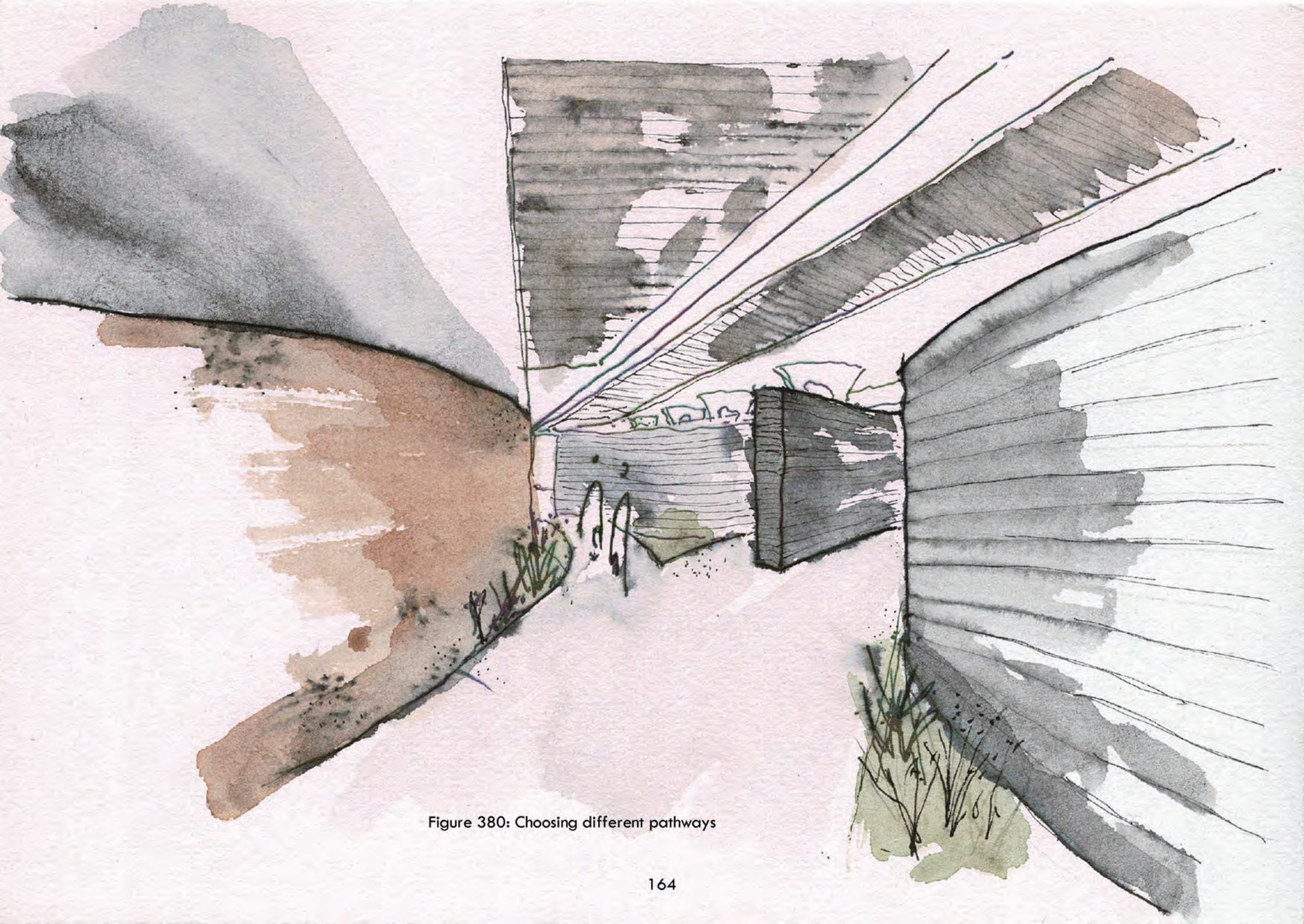


Figure 380: Choosing different pathways

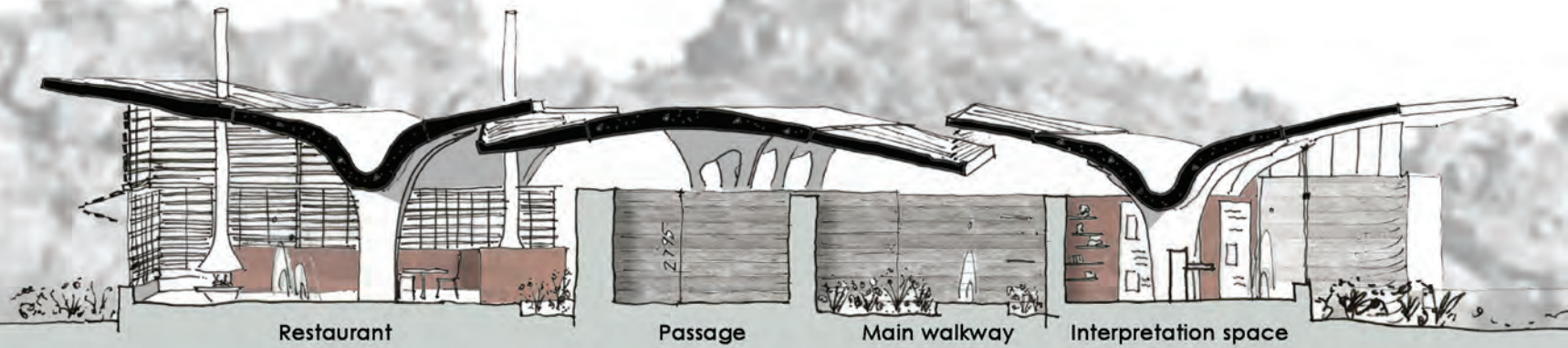
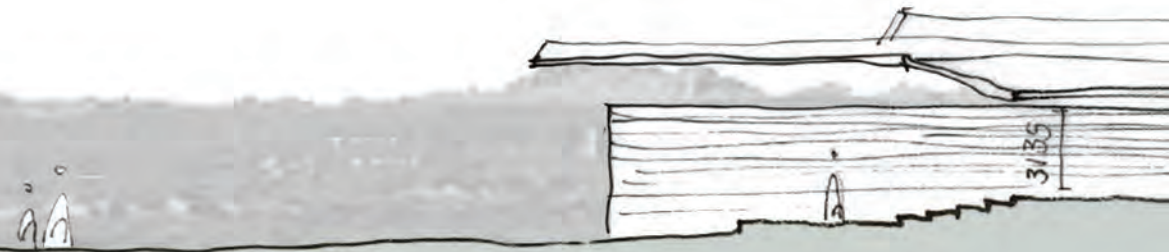


Figure 381: Section E-E  
 0 5 000 10 000  
 scale

Figure 380 illustrates how the pathways divide into different spaces and Figure 382 illustrates the main walkway that leads from the entrance to the stadsaal caves through the building. The proposed designs' public spaces live towards the landscape, and constantly emphasizes the nature-near experience. Refer to Figure 381. The proposed design starts off narrow by entering through the stone masses and whilst moving through the building the spaces unfolds to the visitor. Refer to Figure 983.

Figure 382: Section C-C



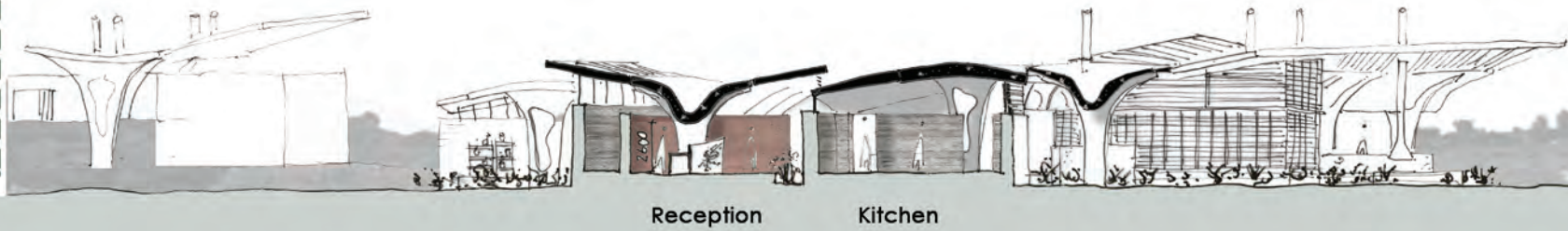
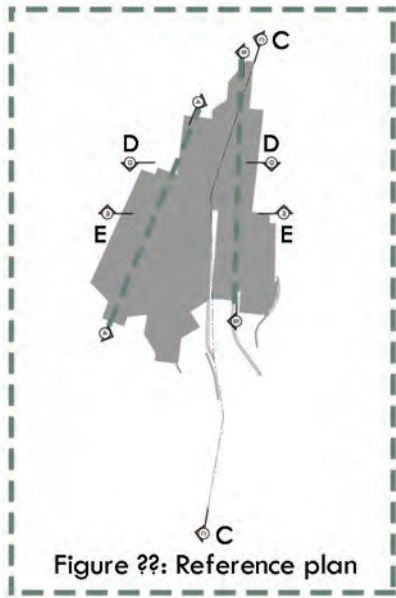
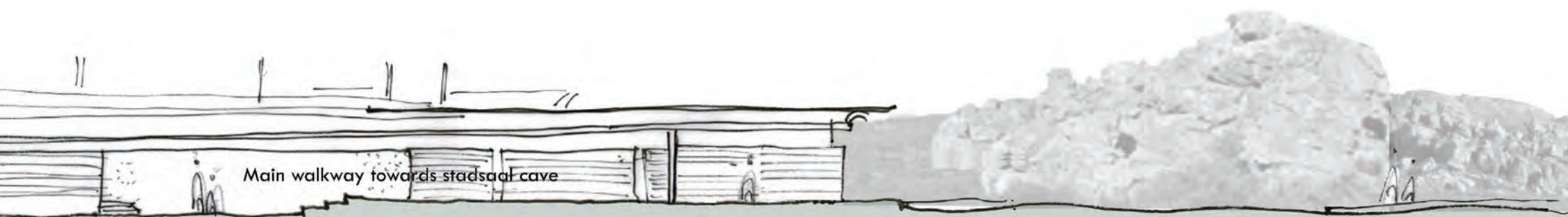


Figure 383: Section D-D

0      5 000      10 000  
 scale



Upon arrival the visitor has the option to visit the interpretation centre which will start off with a brief presentation about the geomorphology, fynbos and cedar tree of the Cederberg. Refer to Figure 384.

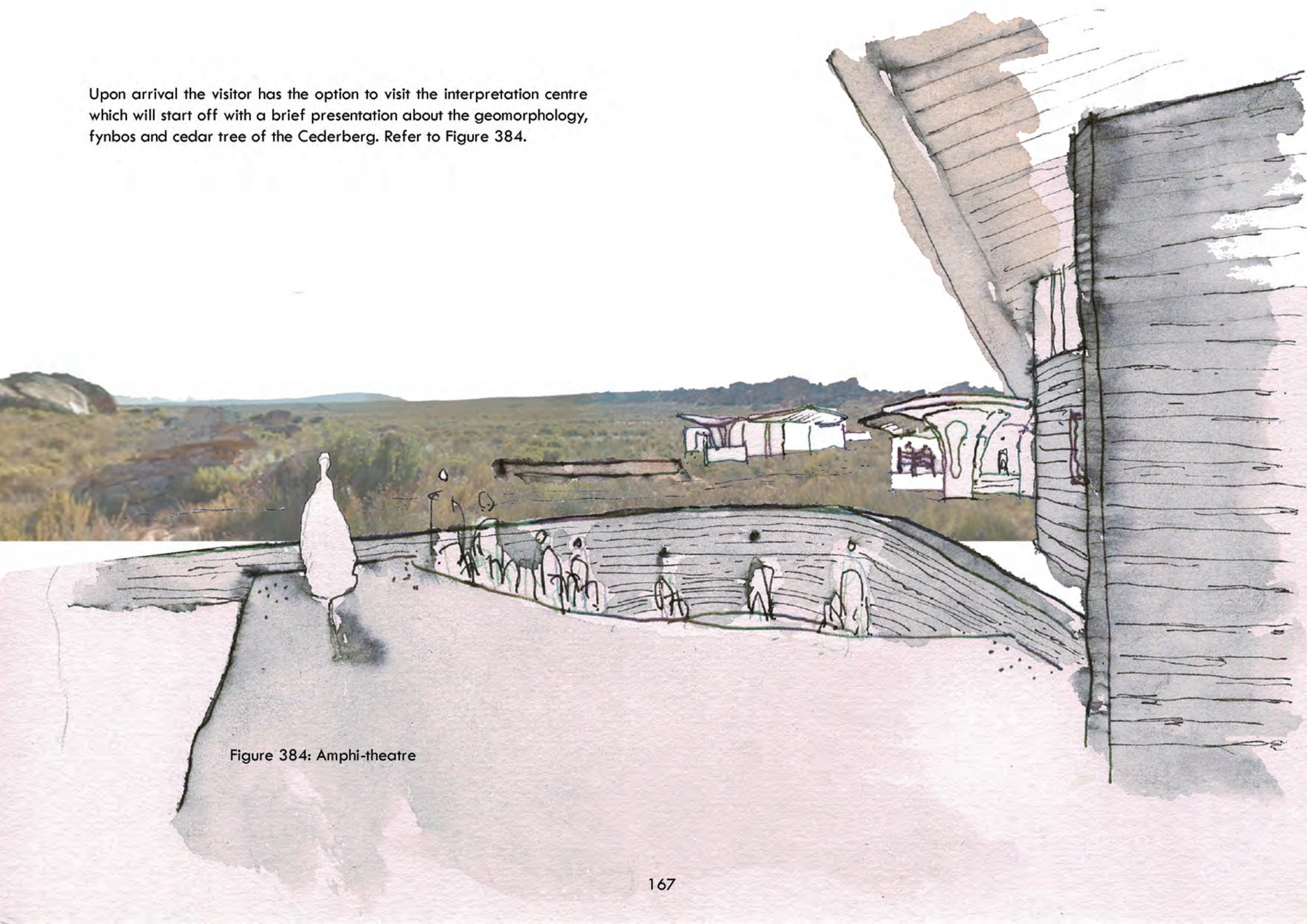


Figure 384: Amphi-theatre



Figure 385: Interpretation space



**Figure 386: Floor Plan**  
 scale 1:200

The Cedar tree / Fynbos shop can be visited when returning from the stadsaal caves. The shop poses the opportunity to actively aid the process of endangered vegetation species in the Cederberg. Small Cedar trees as well as Fynbos seeds etc. will be sold here. Refer to Figure 386 and 387.



Figure 387: Cedar tree / Fynbos shop

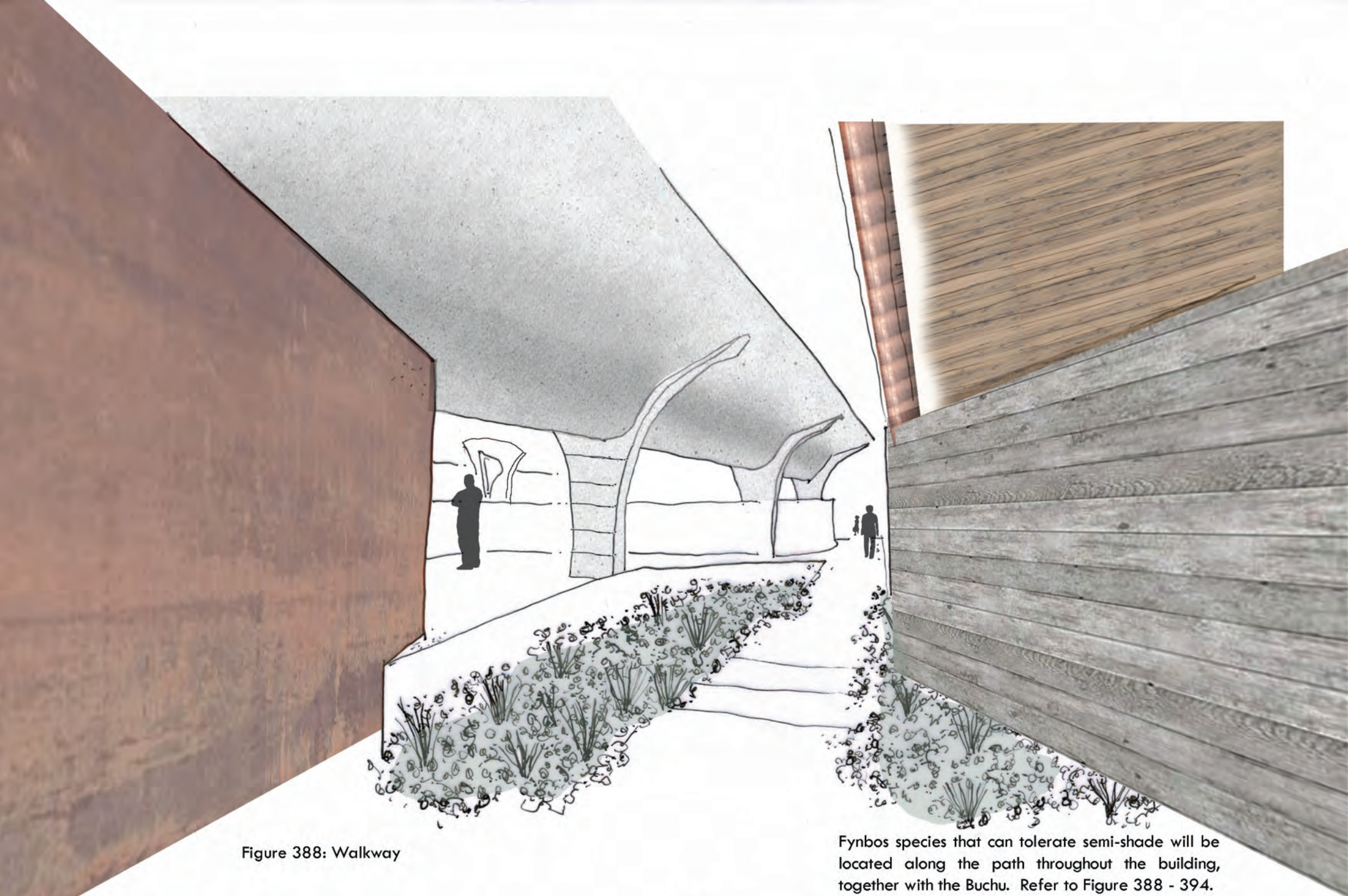


Figure 388: Walkway

Fynbos species that can tolerate semi-shade will be located along the path throughout the building, together with the Buchu. Refer to Figure 388 - 394.

Fynbos that grow in shade



Figure 389: *Agathosma crenulate*  
(The Village news, 2020: online)



Figure 390: *Agathosma gonaquensis*  
(PlantZAfrica, 2020: online)



Figure 394: *Agathosma ovata*  
(Pinterest, 2020: online)



Figure 393: *Bulbine frutescens*  
(Plantinfo, 2020: online)



Figure 391: *Coleonema album*  
(aasbossie)  
(PlantZAfrica, 2020: online)



Figure 392: *Erica Glomiflora*  
(Alamy, 2020: online)

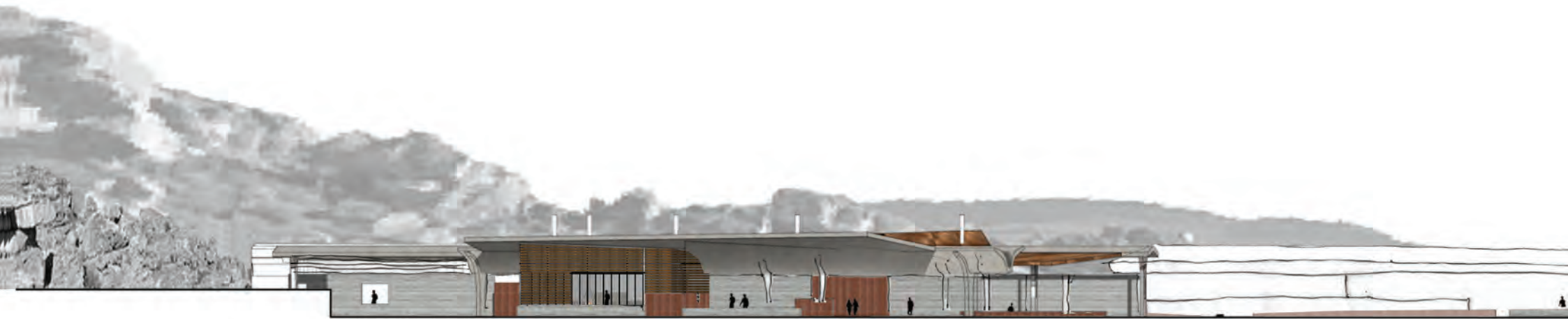
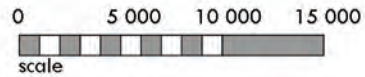


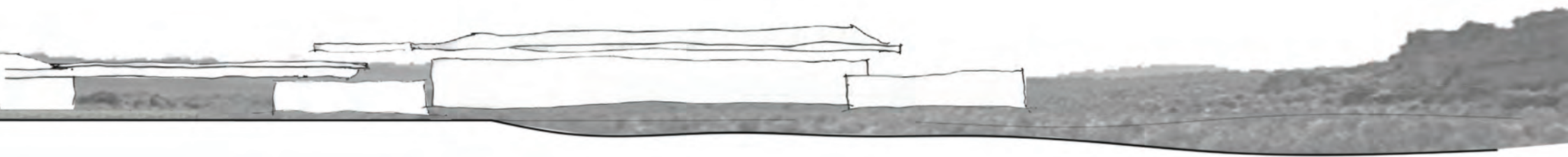
Figure 395: West elevation



The sections as well as the elevations illustrates the project aim of creating the 'balance of nature' with the free forming walls underneath the self-supported roof structure. Refer to Figure 395 and 396. A third of the restaurant is protected against the afternoon sun as well as the ice cold winters with a foldable corten steel screen. The rest is left open to emphasize the nature-near approach once again.



Figure 396: South elevation



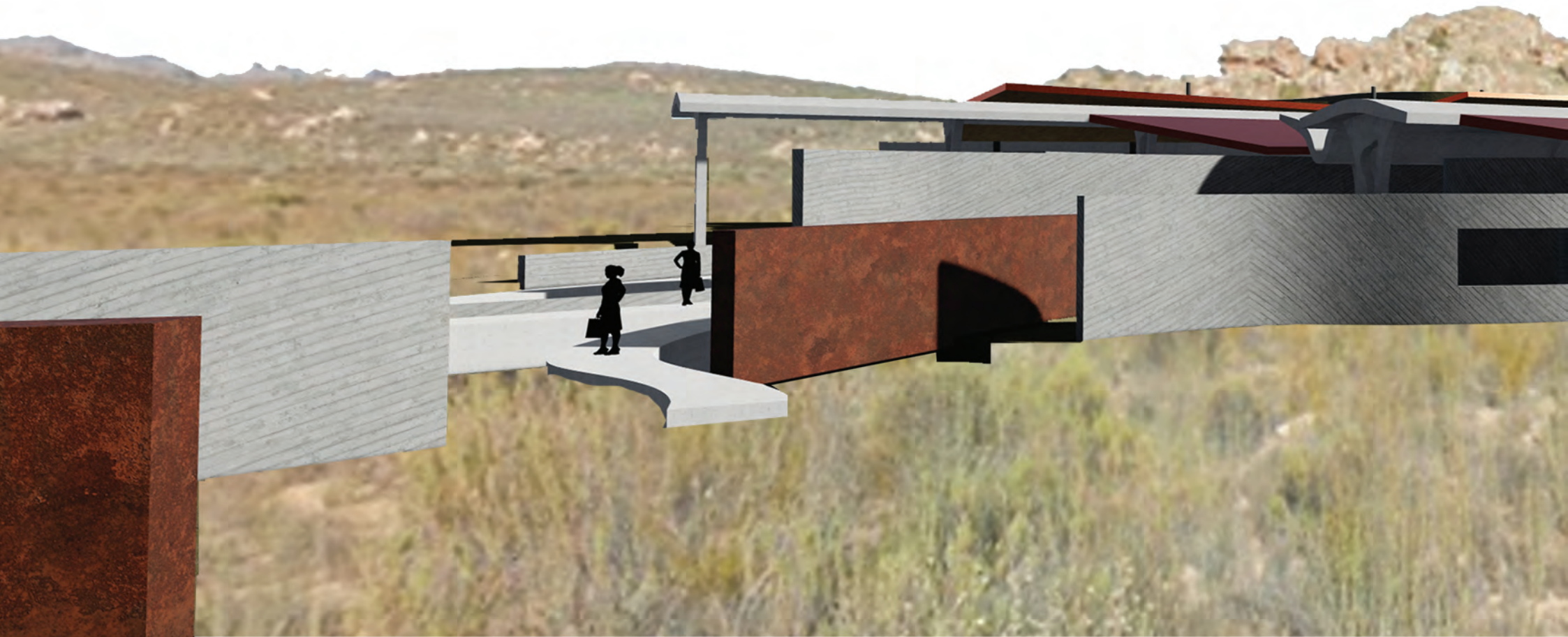


Figure 397: East elevation



The Admin spaces are wrapped in a boarded concrete wall, whilst being able to overlook the landscape. Refer to Figure 398 and 399.

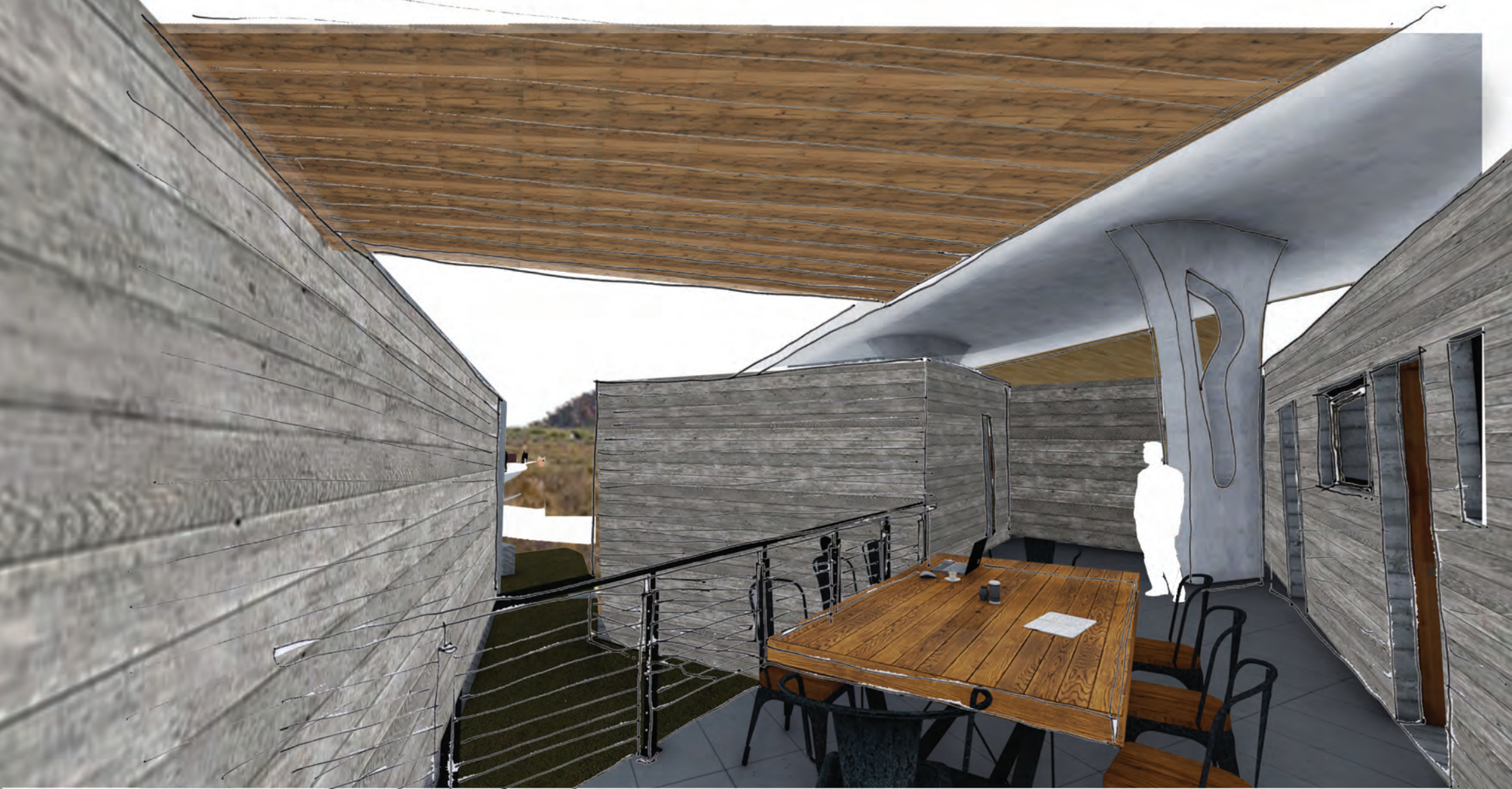


Figure 398: Admin space



Figure 399: Staff room

The concrete gutter aims to immitate the experience of a cave, posing the opportunity for a unique experience. Refer to Figure 400.



Figure 400: Enclosed area of the Restaurant

Low, cladded corten steel walls forms smaller pods in the restaurant, each with its own fireplace, to create a comfortable and memorable experience when overlooking the landscape and watching the sun set. Refer to Figure 400 - 403.

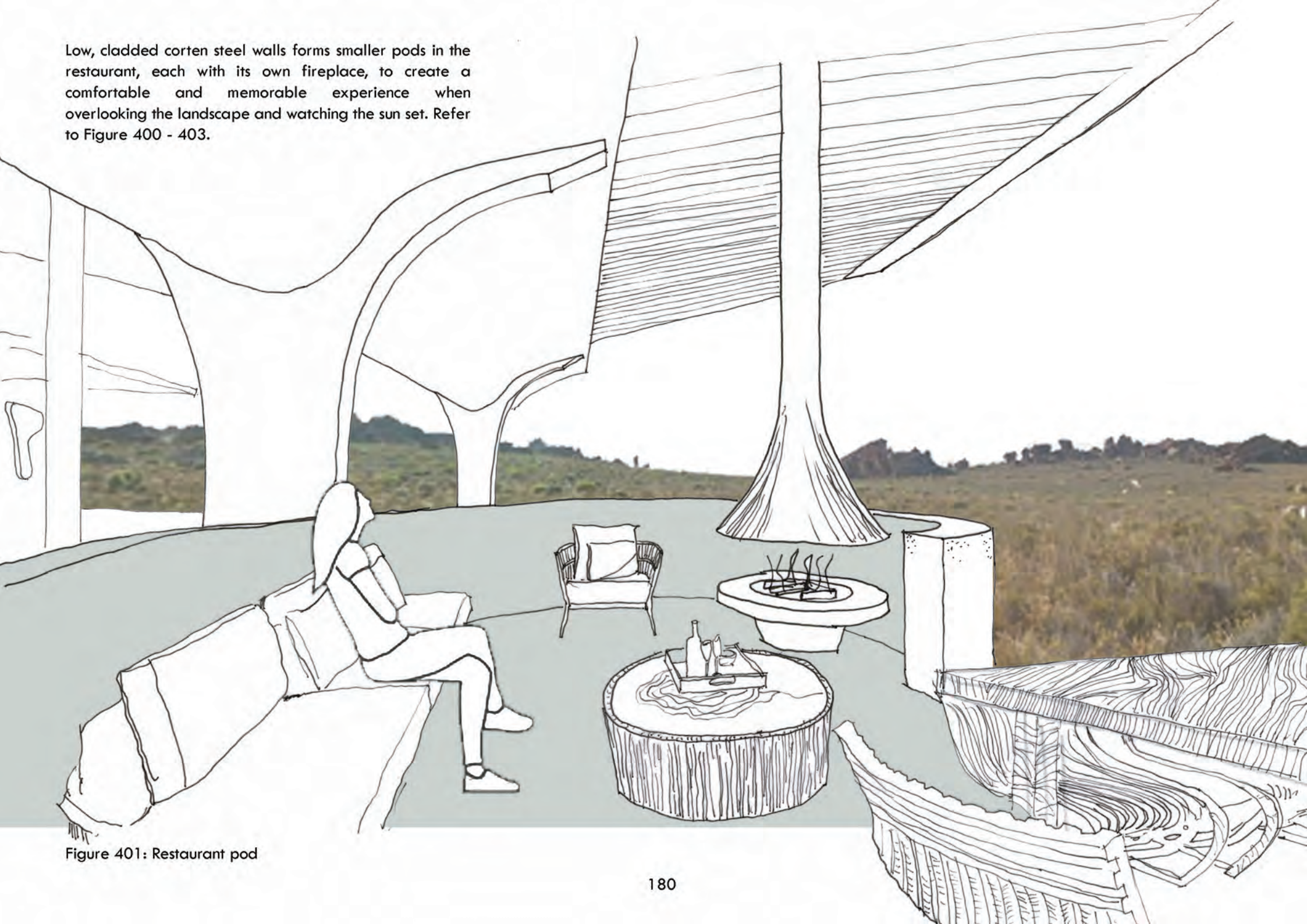


Figure 401: Restaurant pod

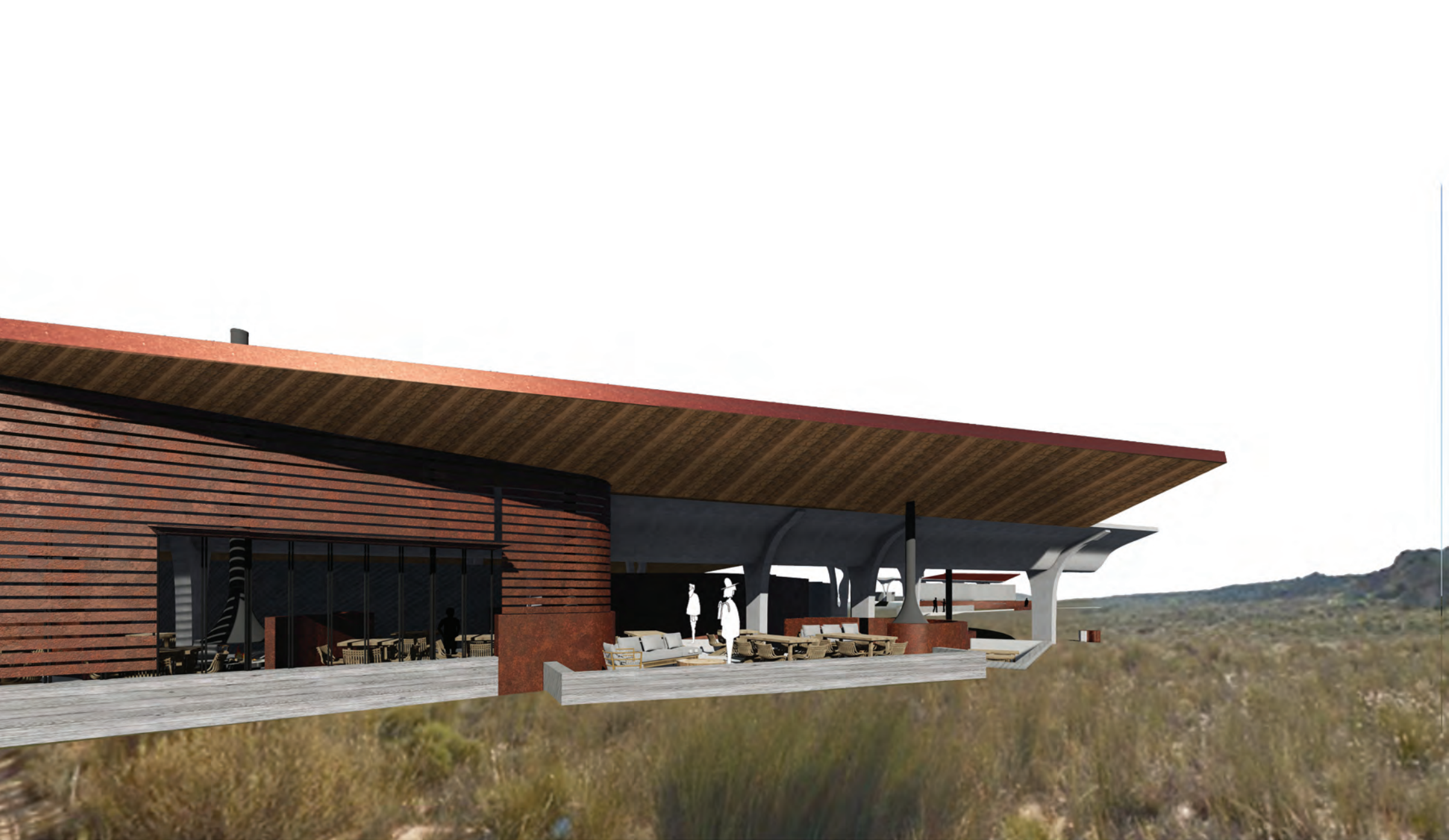


Figure 402: West elevation



Figure 403: View from restaurant



Figure 404: Accommodation



## Unit 1 - Bobbejaangesiggie



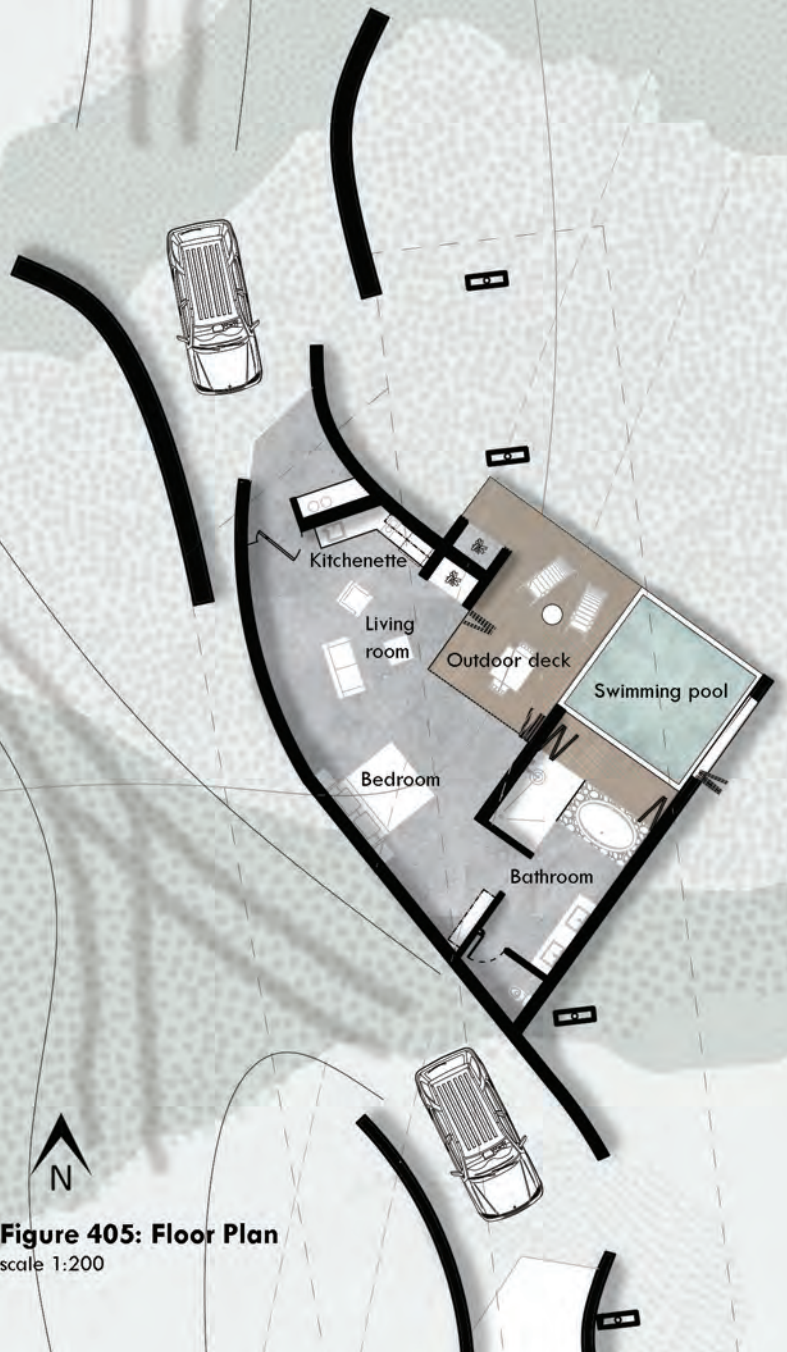
Figure 406: Bobbejaangesiggie

Each accommodation unit has a unique Afrikaans, fynbos name. The units are designed to live out towards the landscape, thus each unit is turned in such a way to have the most possible privacy with an small swimming pool that overlooks the landscape. Refer to page 183 - 192.

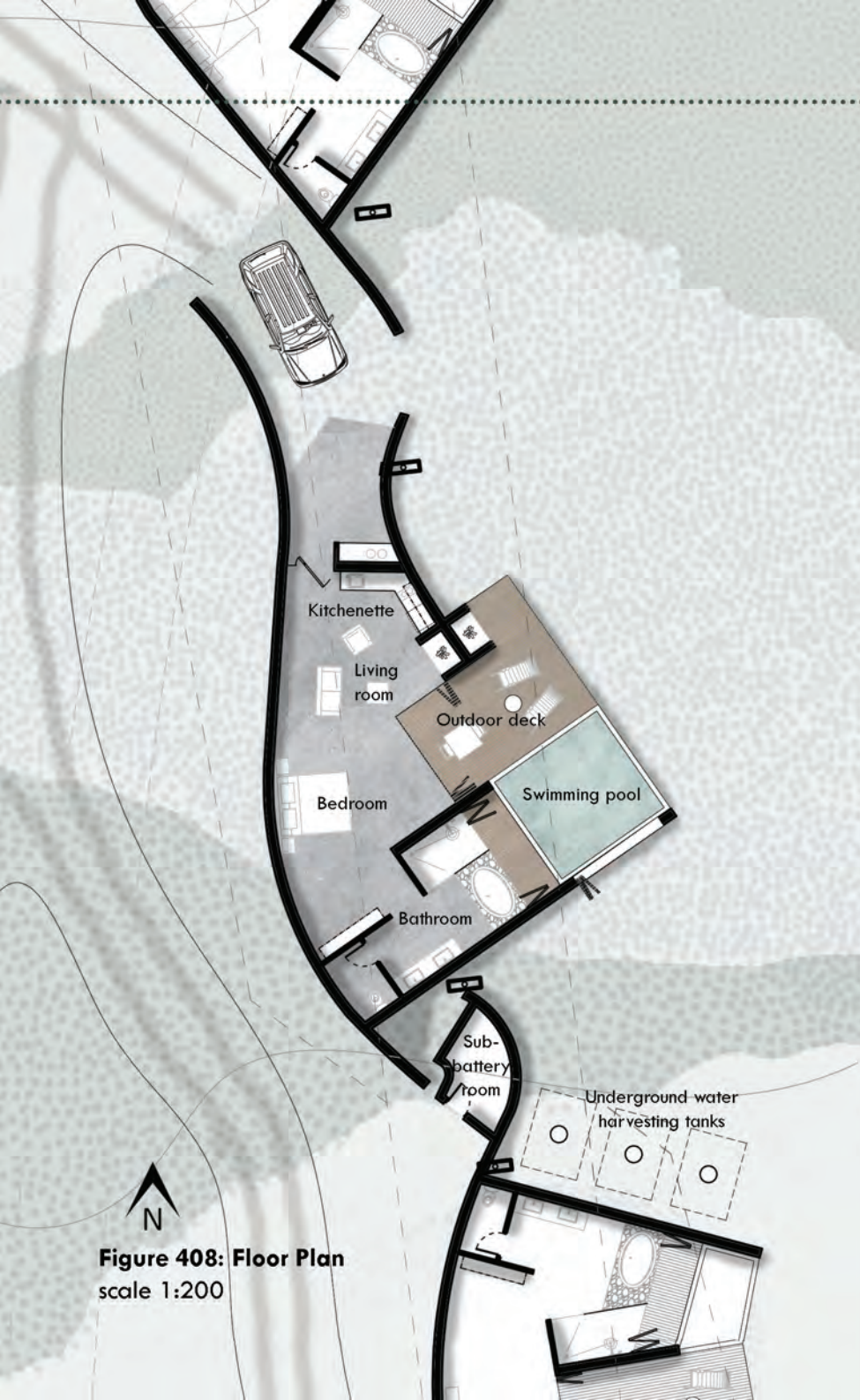


Figure 407: Unit 1 - Bobbejaangesiggie

Figure 405: Floor Plan  
scale 1:200



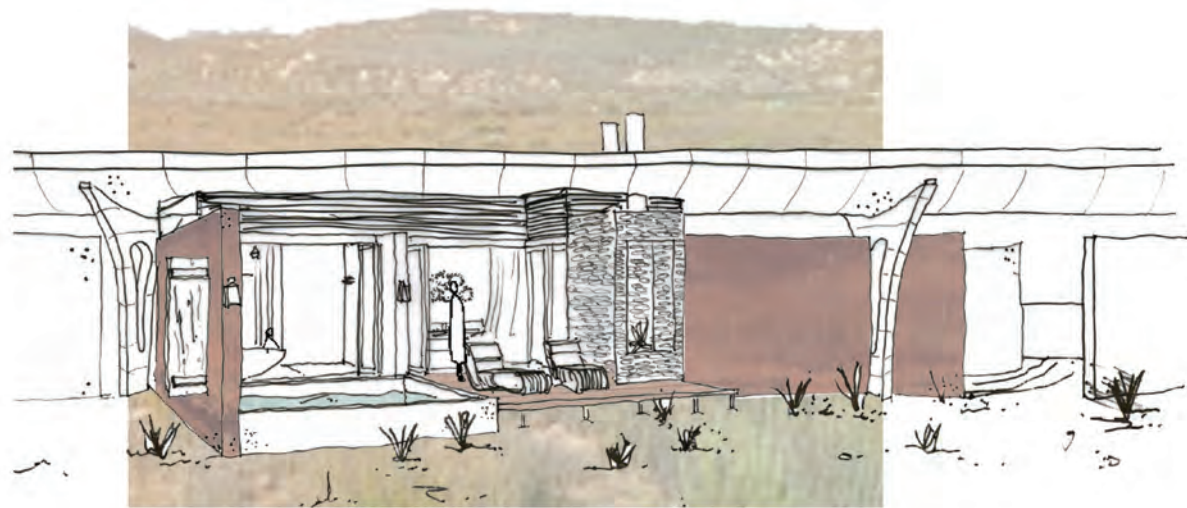
## Unit 2 - Rooistompie



**Figure 408: Floor Plan**  
scale 1:200



**Figure 409: Rooistompie**



**Figure 410: Unit 2 - Rooistompie**

### Unit 3 - Aasbossie

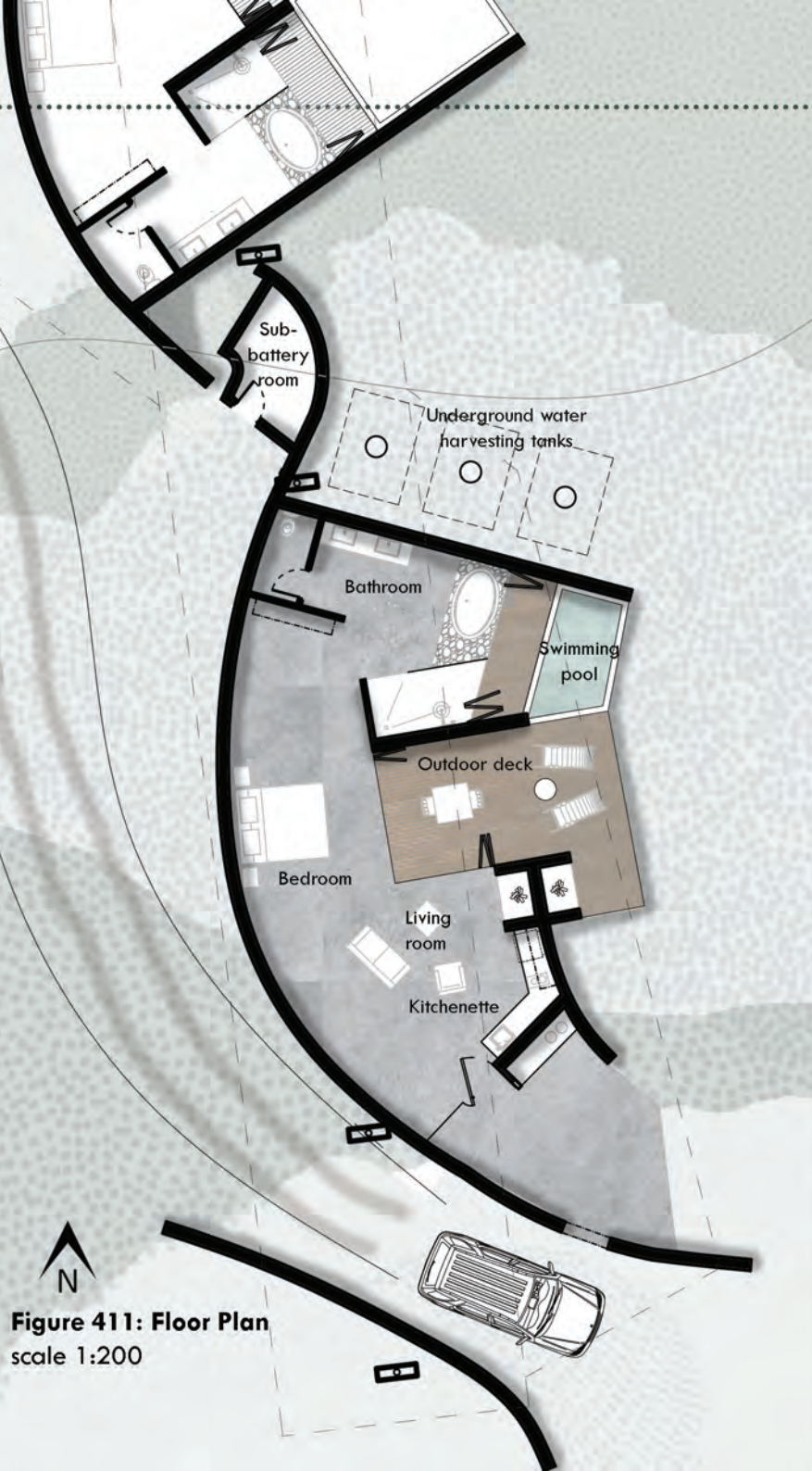


Figure 411: Floor Plan  
scale 1:200



Figure 412: Aasbossie

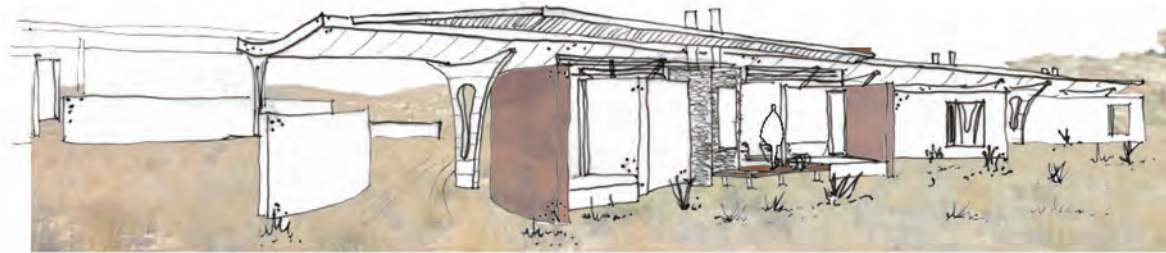


Figure 413: Unit 3 - Aasbossie



Figure 414: Accommodation units from behind

## Unit 4 - Geelmagriet



(Author, 2020)

Figure 416: Geelmagriet

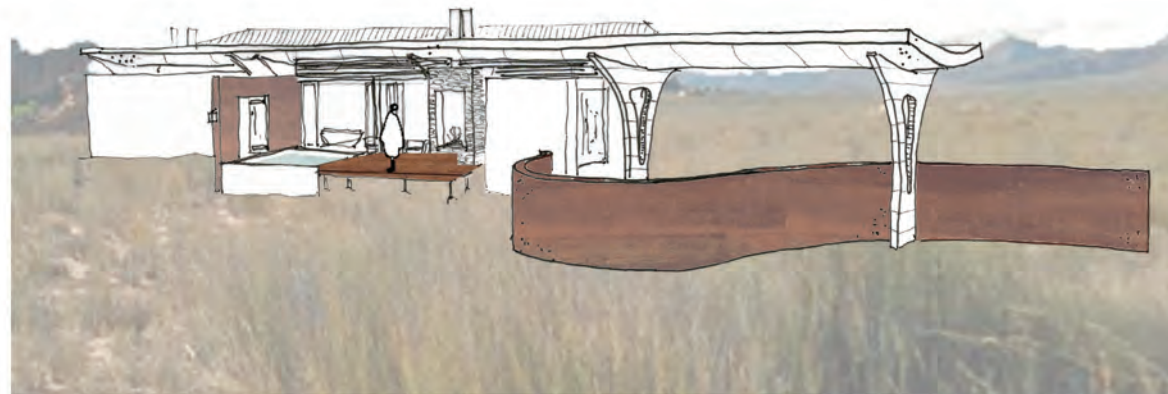
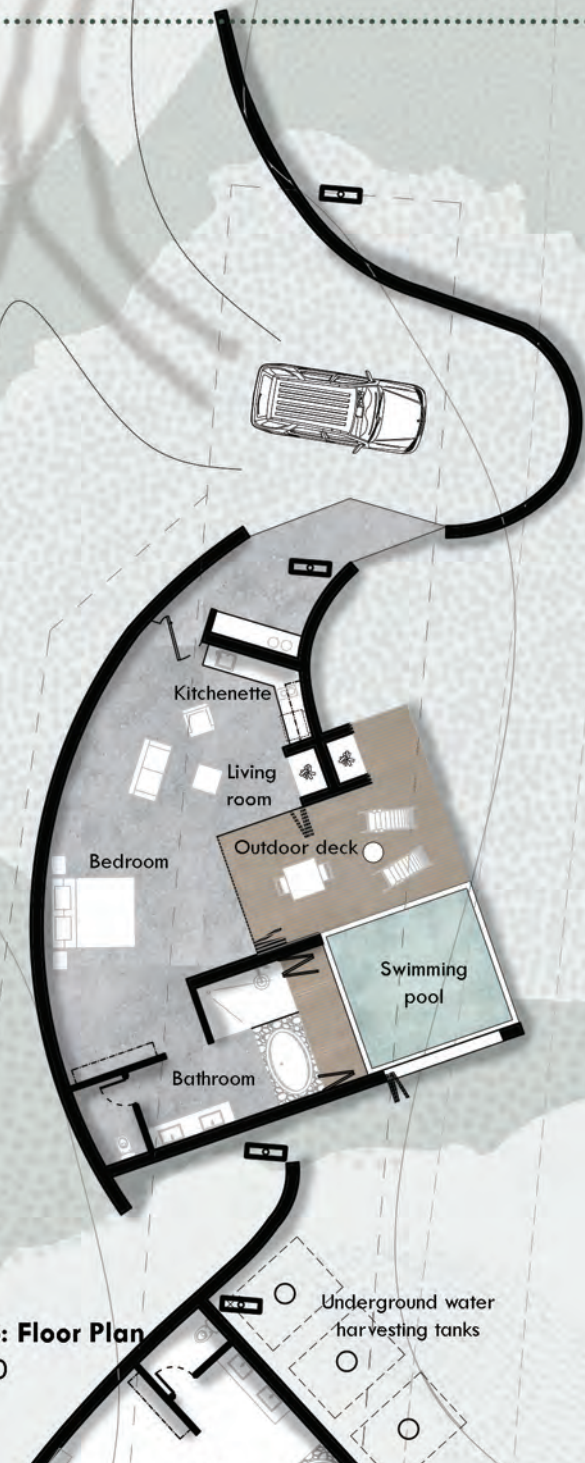


Figure 417: Unit 4 - Geelmagriet

Figure 415: Floor Plan  
scale 1:200



## Unit 5 - Speldekussing

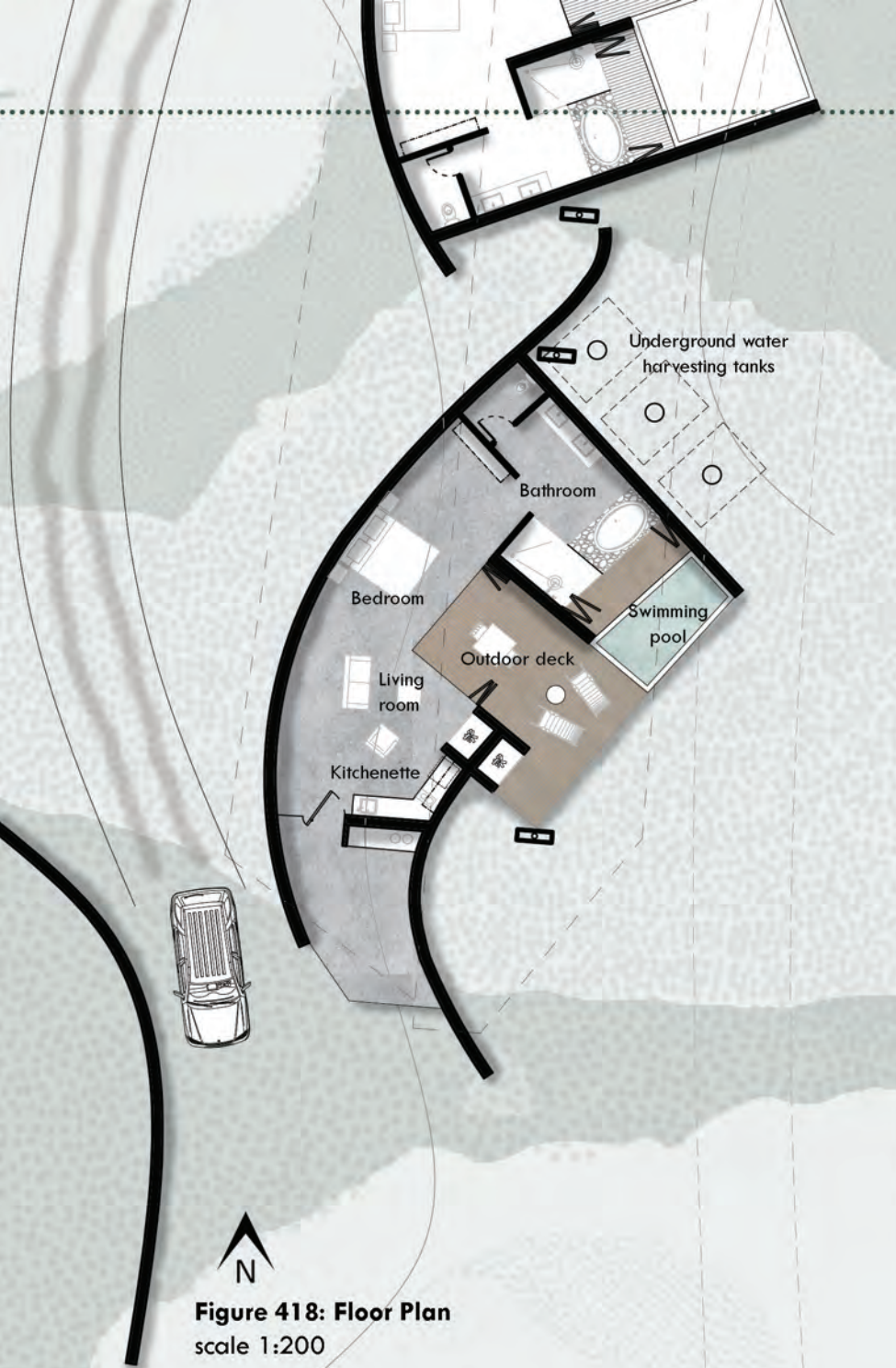


Figure 419: Speldekussing



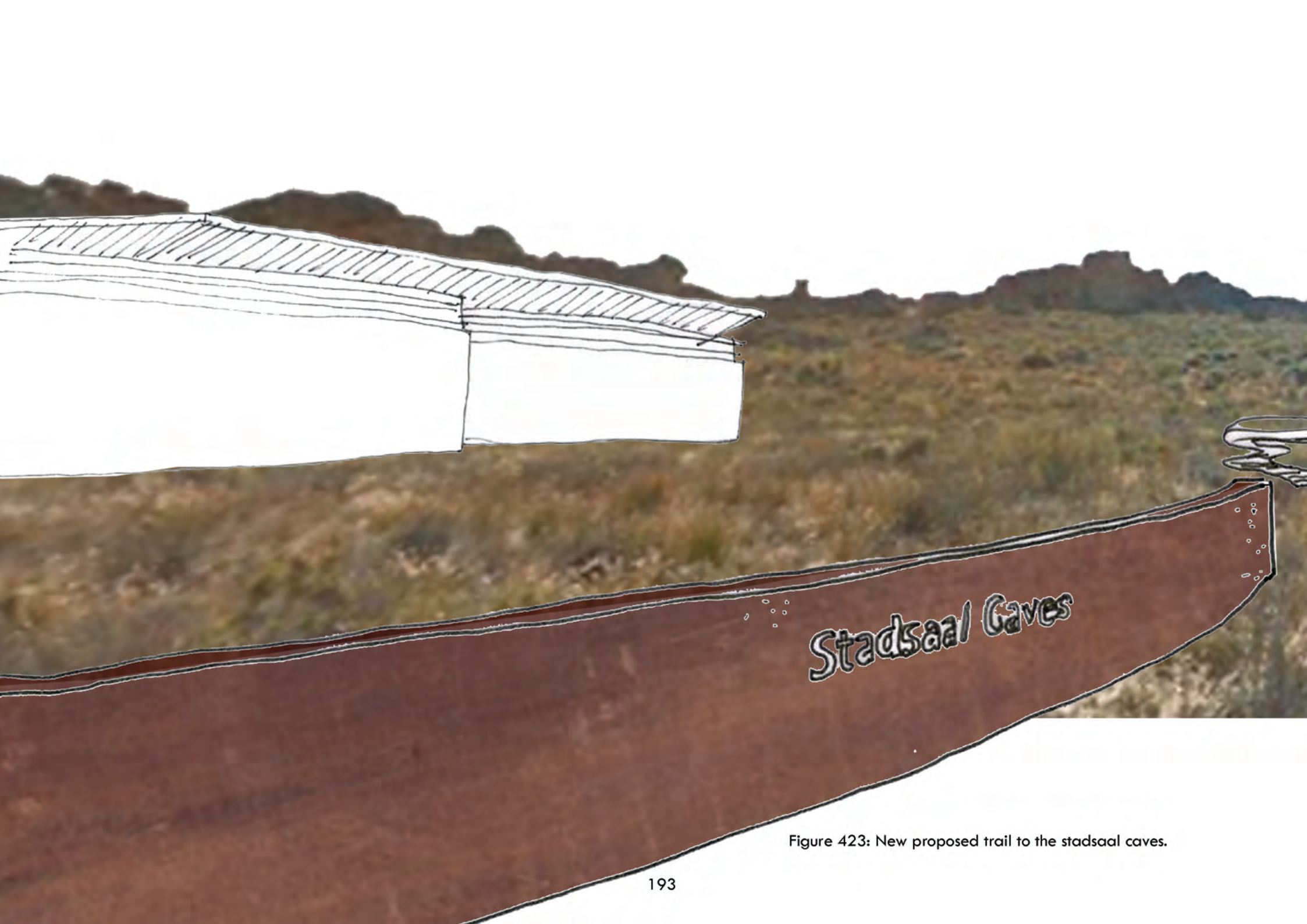
Figure 420: Unit 5 - Speldekussing



Figure 421: Interior perspective of accommodation



Figure 422: Bathroom living out towards the landscape.



Stadsaal Caves

Figure 423: New proposed trail to the stadsaal caves.

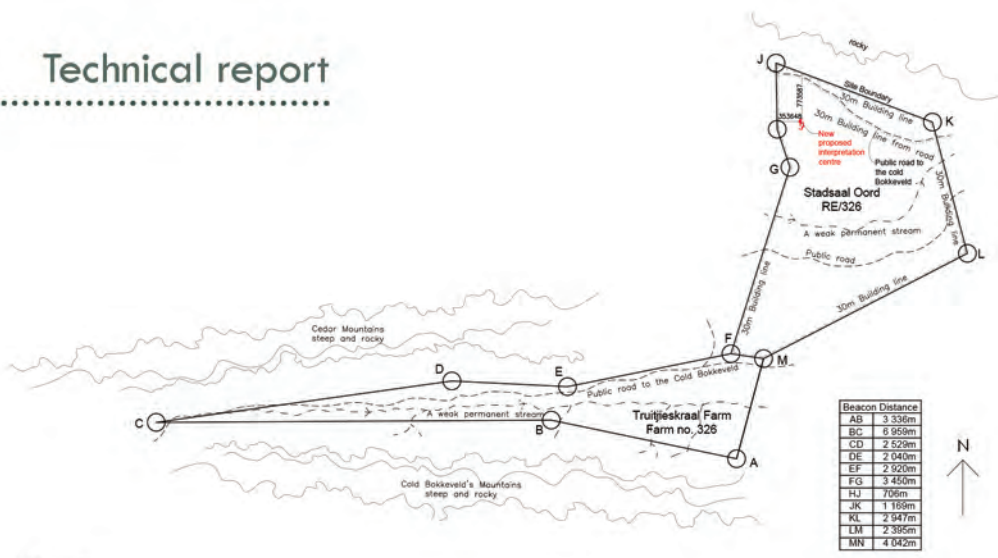
Stadsaal caves

*"...O, pragtig rooi die môre rooi eerd at die son verskyn  
En rooier nog sonsondergang gekleur soos rooi robyn!*

*Die laagland in, die bergland op, die diepste drifte deur,  
Die vlaktes oor, die klowe af waar jy geen pad bespeur;..."*

*C.L. Leipoldt*  
(Kannemeyer, 1980:93)

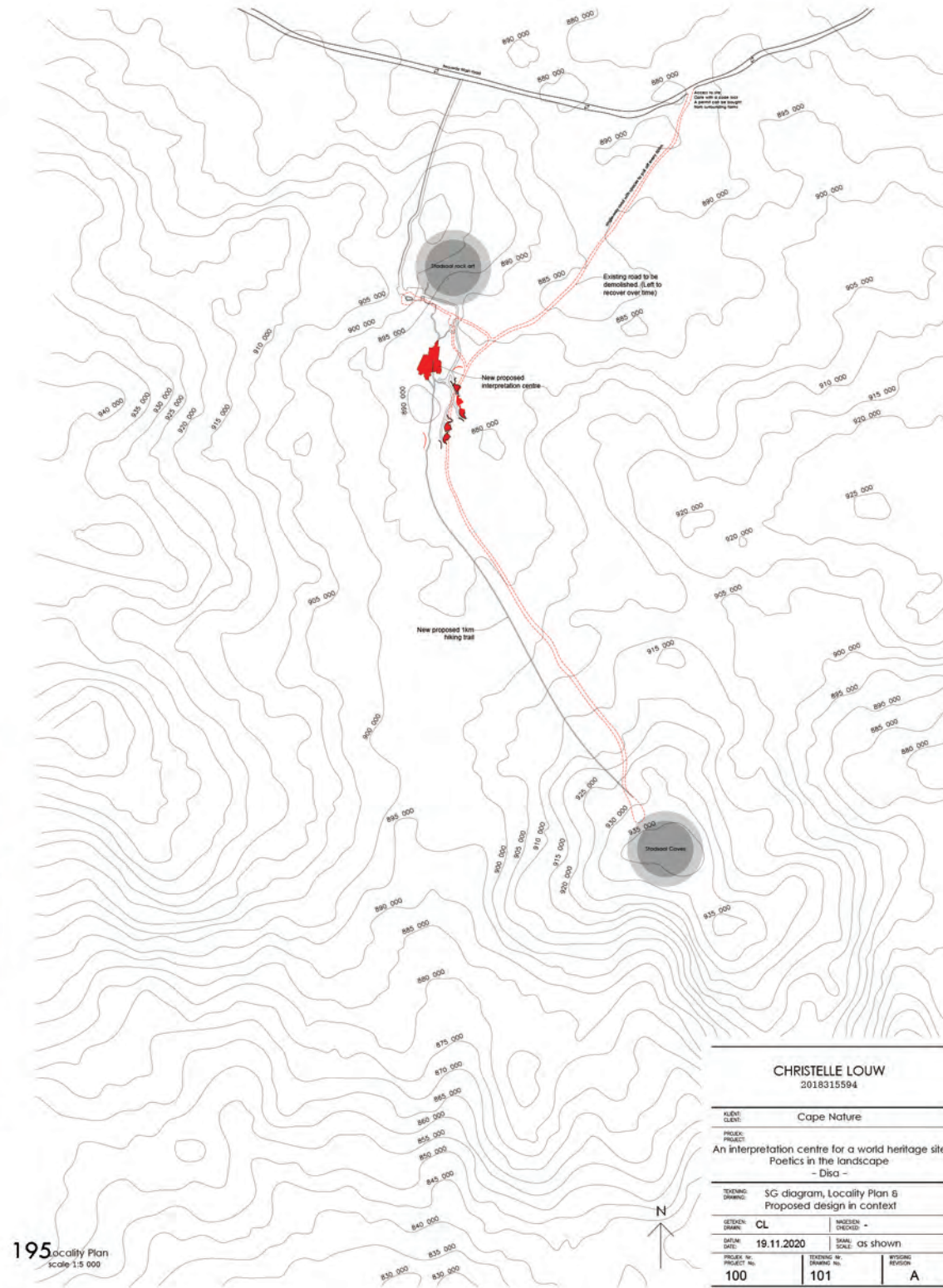
# Technical report



SG Diagram  
scale 1:50 000

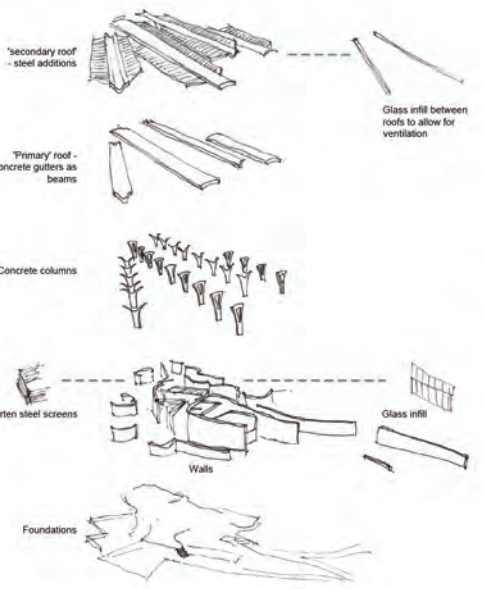


Proposed design in context



195 Locality Plan  
scale 1:5 000

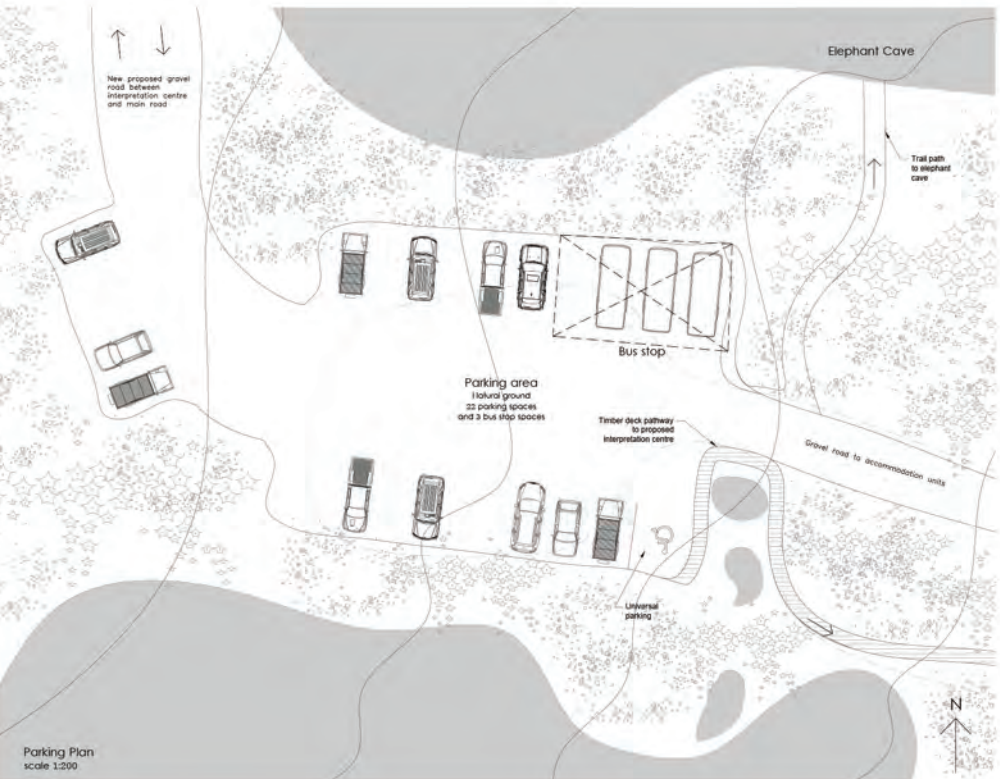
<b>CHRISTELLE LOUW</b> 2018315594		
CLIENT:	Cape Nature	
PROJECT:	An interpretation centre for a world heritage site Poetics in the landscape - Dica -	
TECHNICAL DRAWING:	SG diagram, Locality Plan & Proposed design in context	
DESIGNER:	CL	MANAGER: CHECKED -
DATE:	19.11.2020	SCALE: AS SHOWN
PROJECT NO:	100	REVISION NO: 101
		REVISION: A



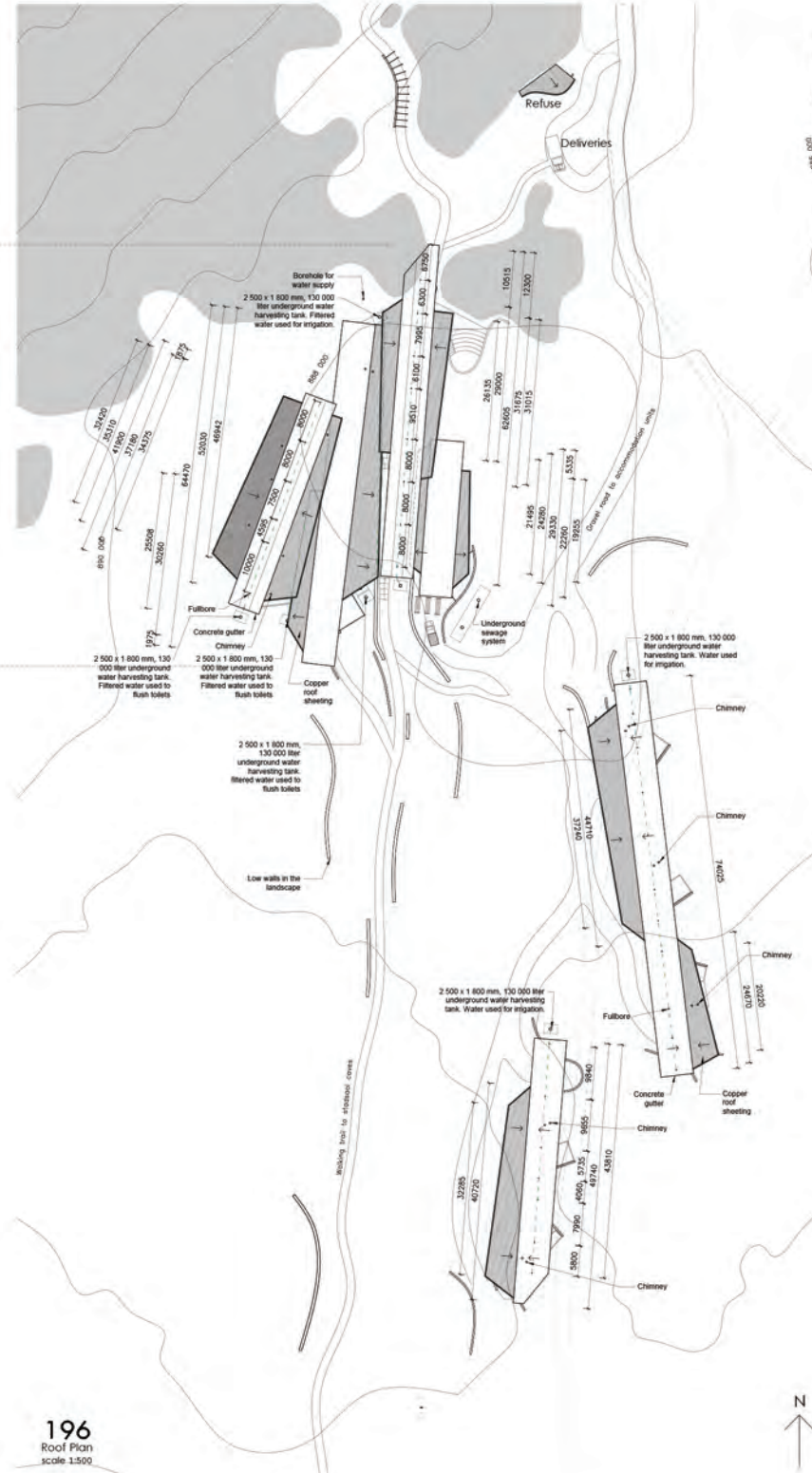
Exploded 3D of Proposed Design



Roof Plan scale 1:500



Parking Plan scale 1:200



196 Roof Plan scale 1:500

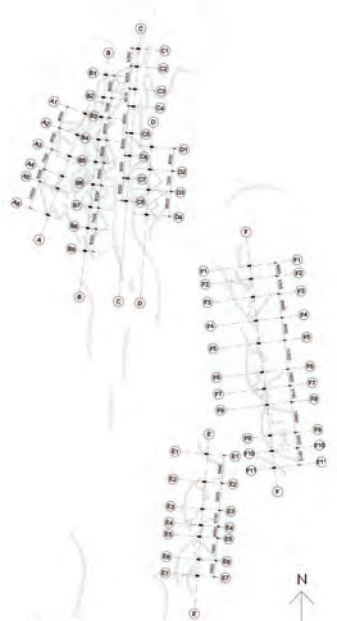
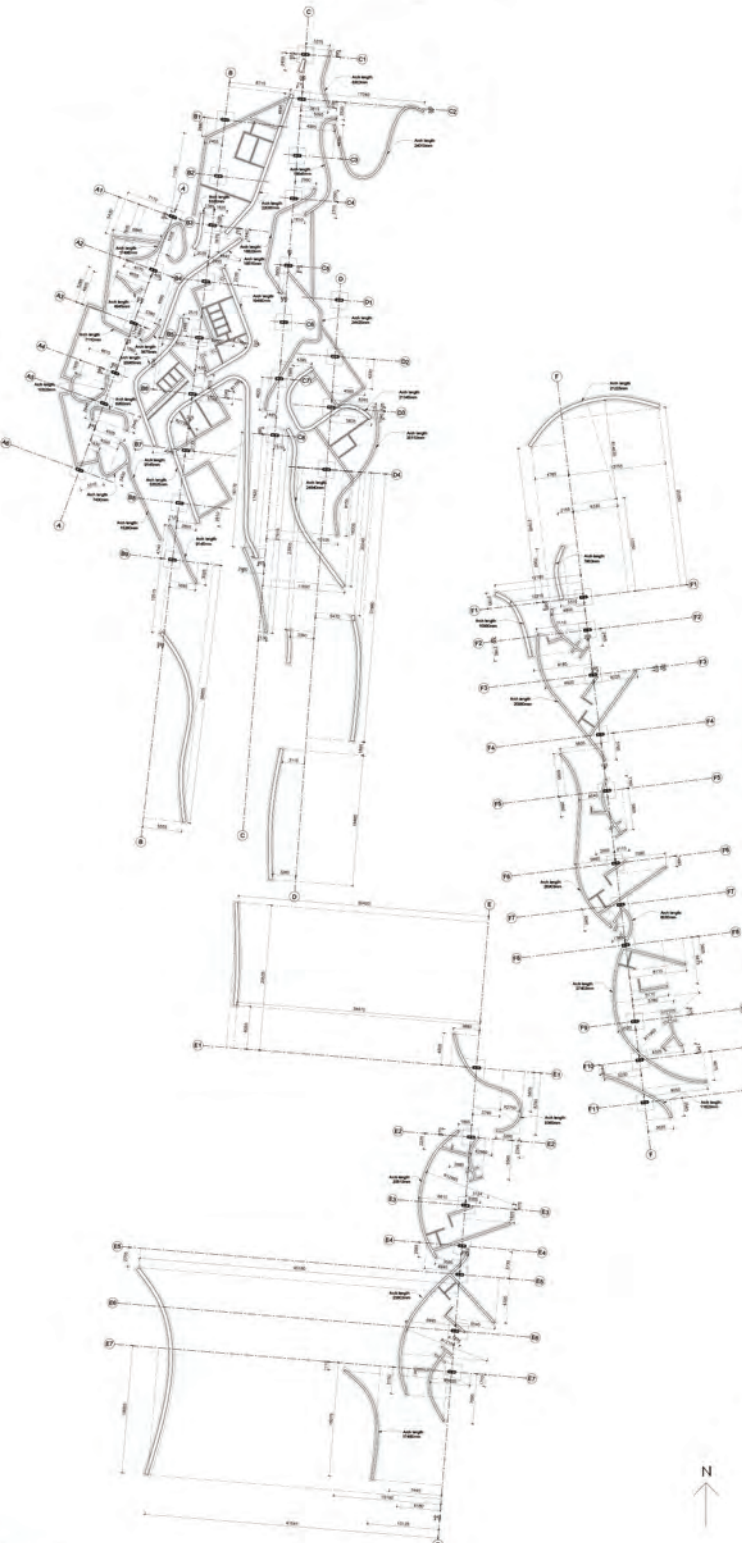
Demolish existing road to allow for recovering of vegetation and limit vehicular access to site

CHRISTELLE LOUW  
 2018315594

CLIENT: Cape Nature  
 PROJECT: An interpretation centre for a world heritage site Poetics in the landscape - Disa -

TEXTING DRAWING: Roof Plan and Parking Plan

DATE: 19.11.2020	SCALE: as shown
PROJECT NO: 100	ISSUE NO: 102
REVISION: A	



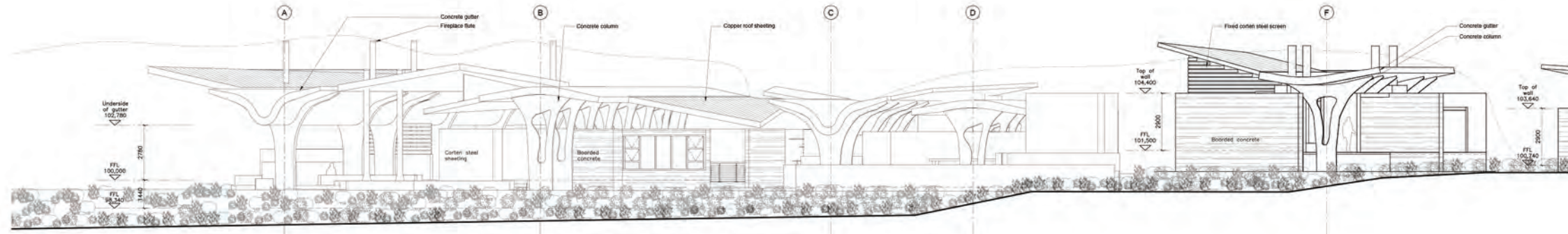
NOTES:  
Structural grids will be set out by GPS coordinates

CHRISTELLE LOUW 201811894	
01	Cape Nature
An Interpretation centre for a world heritage site Pretoria in the landscape © 2018	
02	Foundation Plan
03	Column Plan & Fire Plan
04	Site Plan
05	Site Plan
06	Site Plan
07	Site Plan
08	Site Plan
09	Site Plan
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12	Site Plan
13	Site Plan
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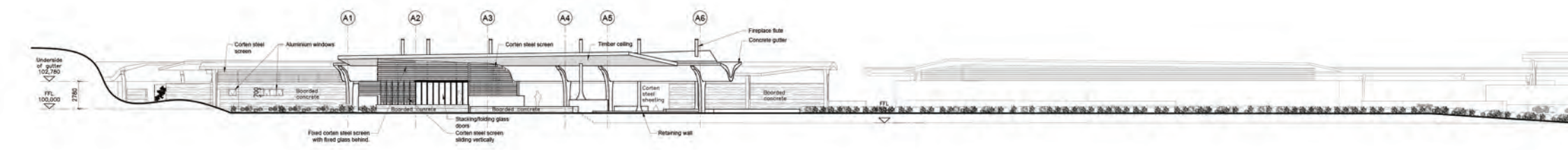


CHRISTELLE LOUW 201811894	
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An Interpretation centre for a world heritage site Pretoria in the landscape © 2018	
02	Foundation Plan
03	Column Plan & Fire Plan
04	Site Plan
05	Site Plan
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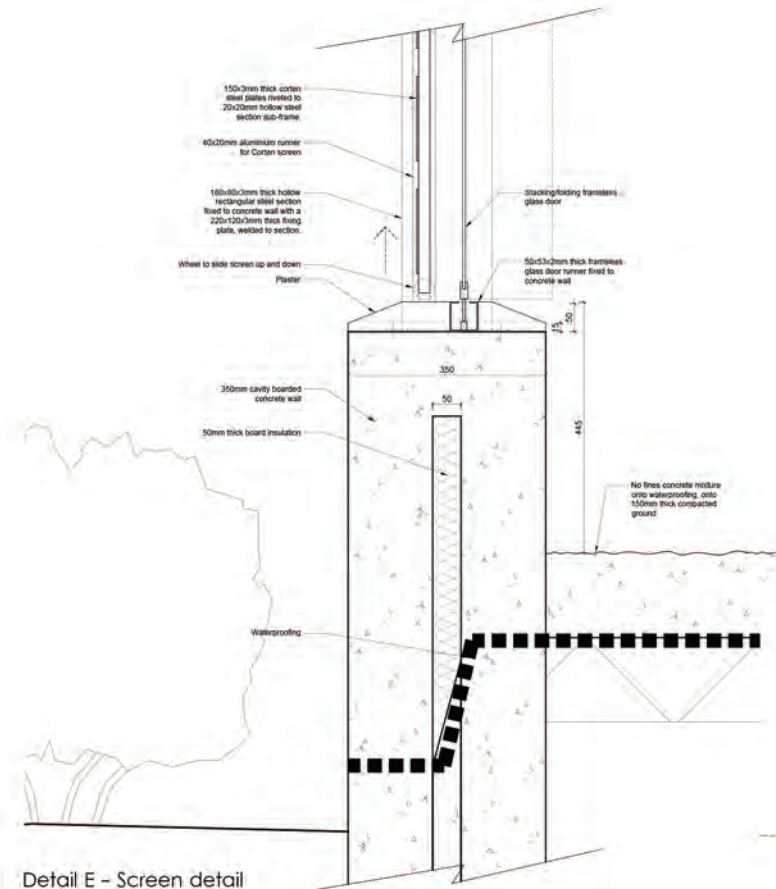
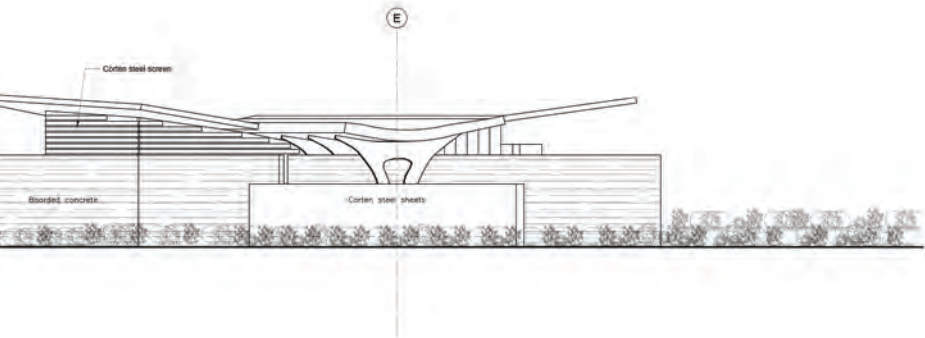




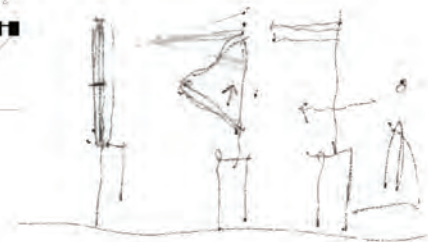
South elevation  
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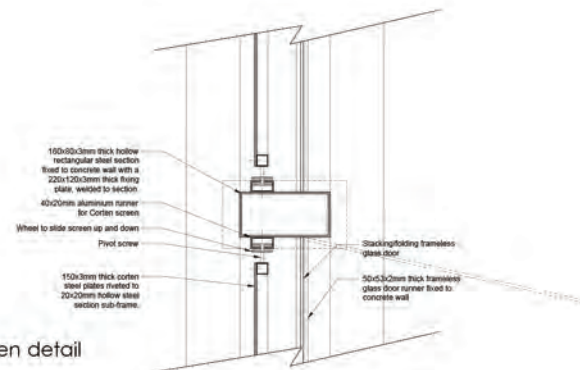
West elevation  
scale 1:200



Detail E - Screen detail Section  
scale 1:5



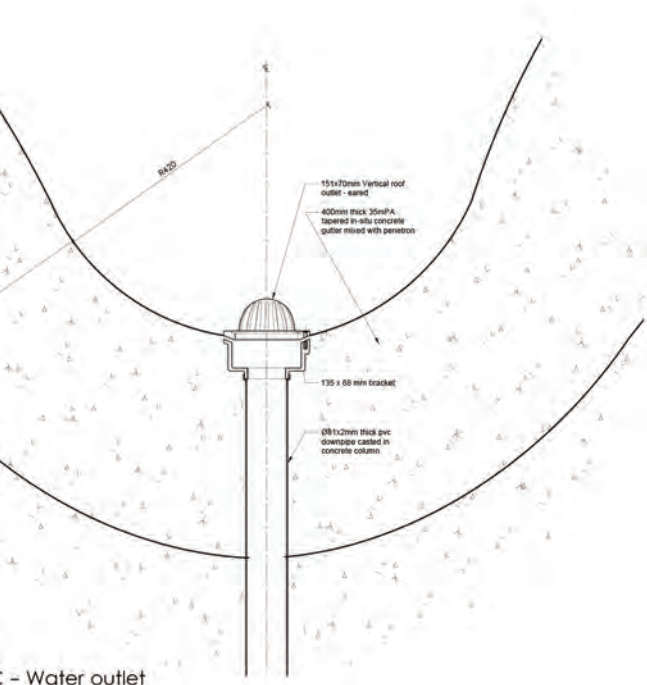
Sketch of how screen would work



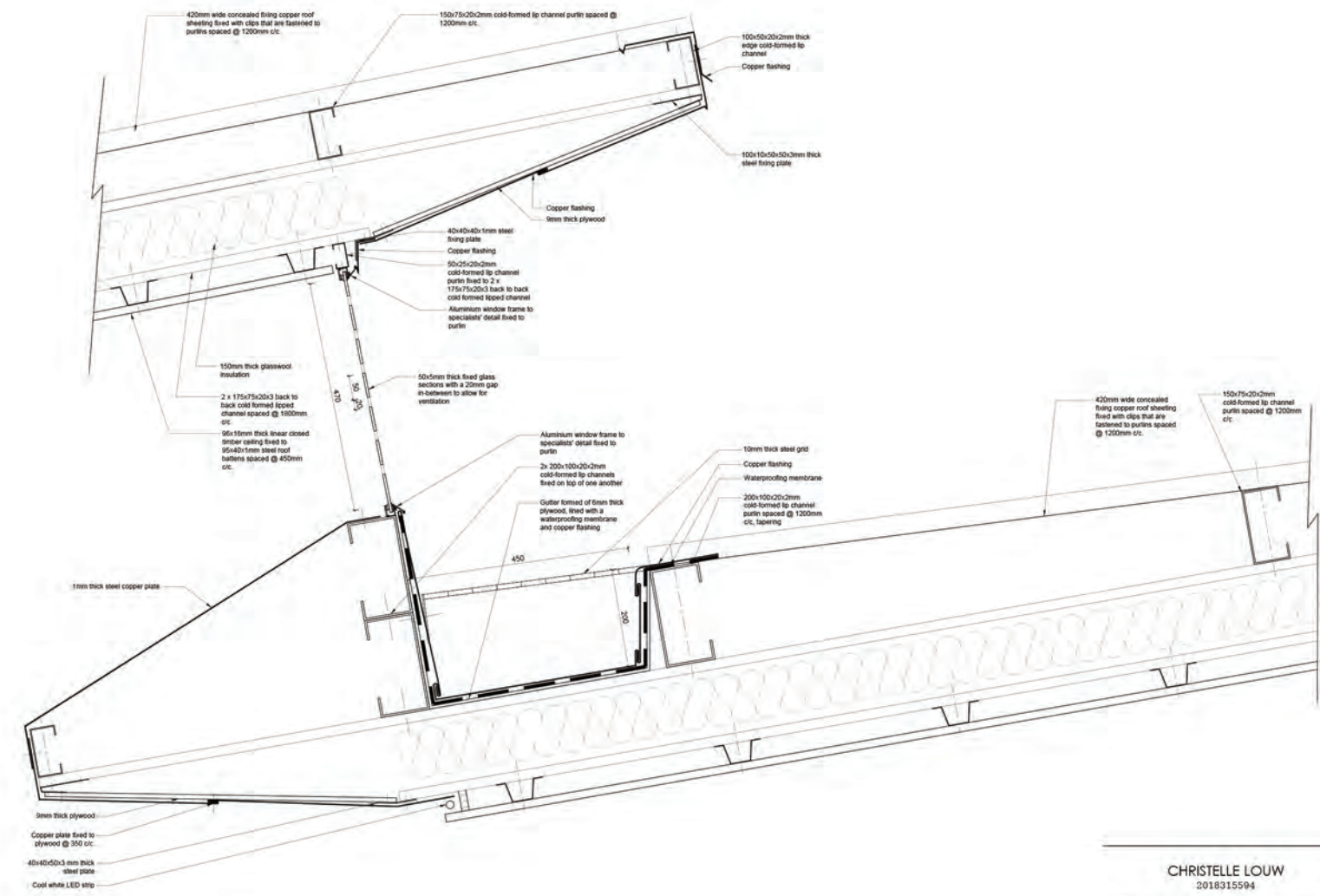
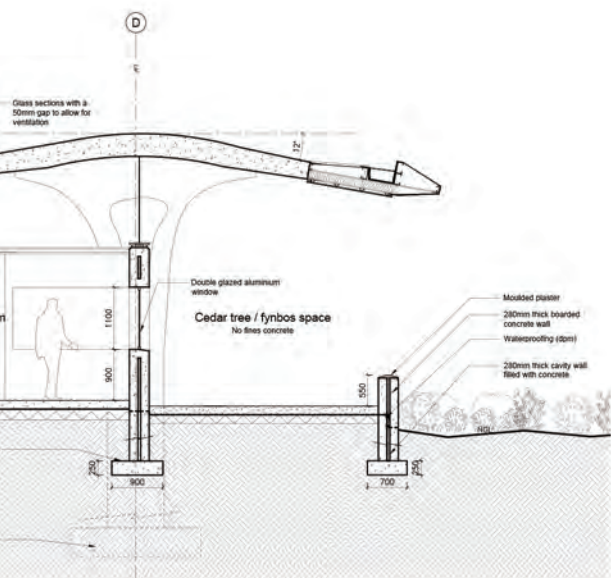
Detail E - Screen detail Plan  
scale 1:5

<b>CHRISTELLE LOUW</b> 2018315594			
CLIENT	Cape Nature		
PROJECT	An interpretation centre for a world heritage site Poetics in the landscape - Dia -		
STATIONING	South & West Elevation, & detail E		
DESIGNED BY	CL	CHECKED BY	-
DATE	19.11.2020	SCALE	as shown
PROJECT NO.	100	DRAWING NO.	302
		REVISION	A



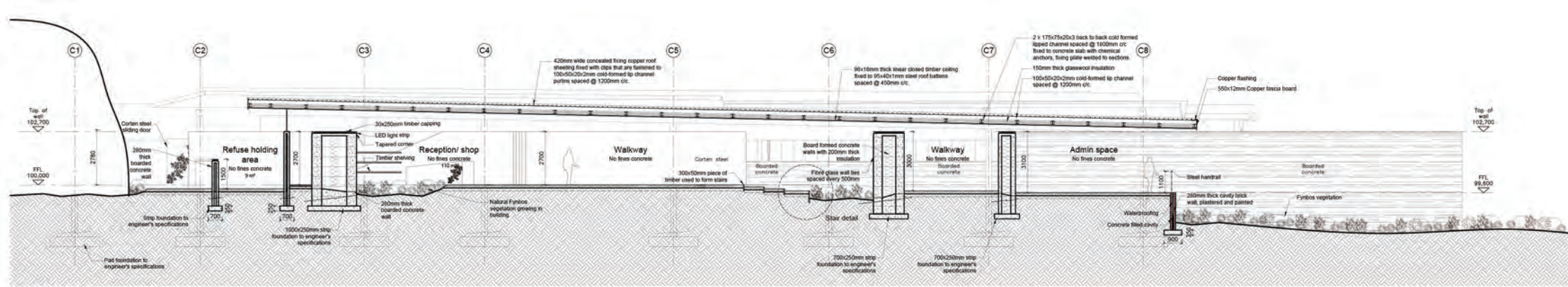


Water outlet

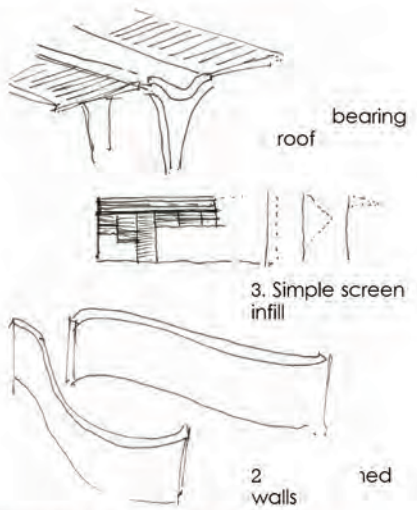


Detail D - Roof connection  
scale 1:5

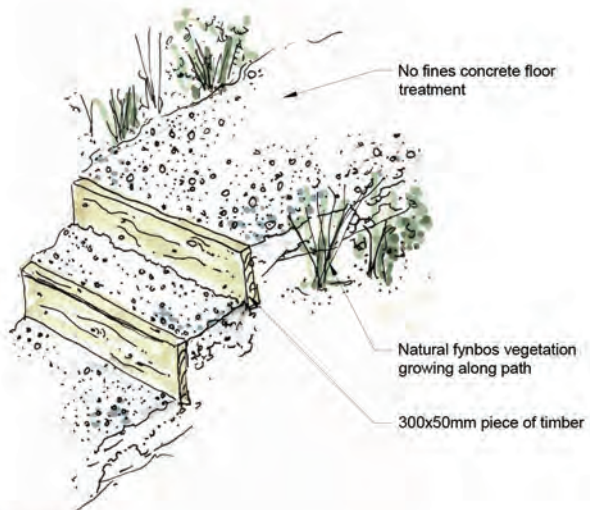
CHRISTELLE LOUW 2018315594		
CLIENT:	Cape Nature	
PROJECT:	An interpretation centre for a world heritage site Poetics in the landscape - Dica -	
DRAWING:	Section F-F & Details	
DESIGNER:	CL	DATE: 19.11.2020
CHECKED:	SCALE:	AS SHOWN
NO.:	301	A



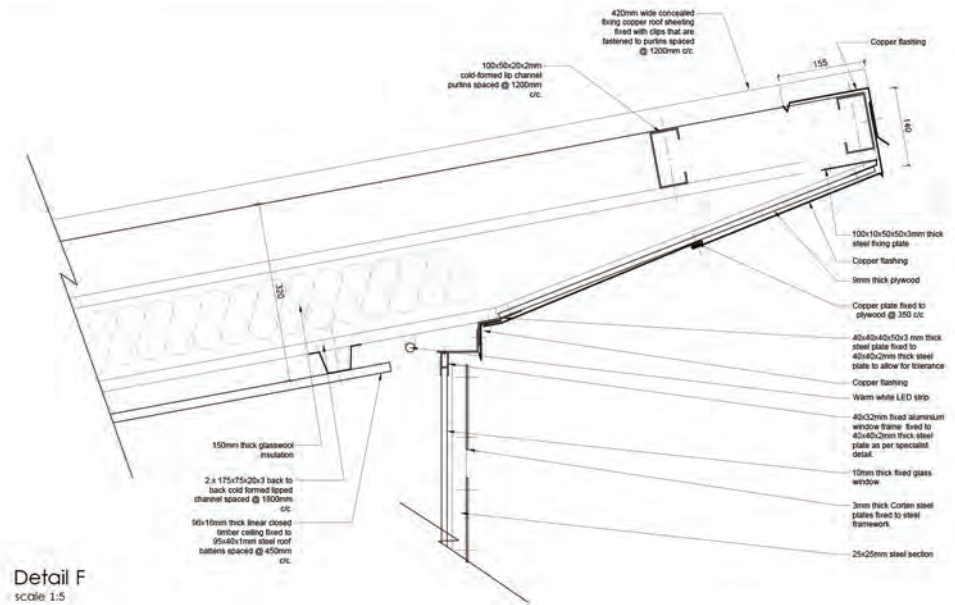
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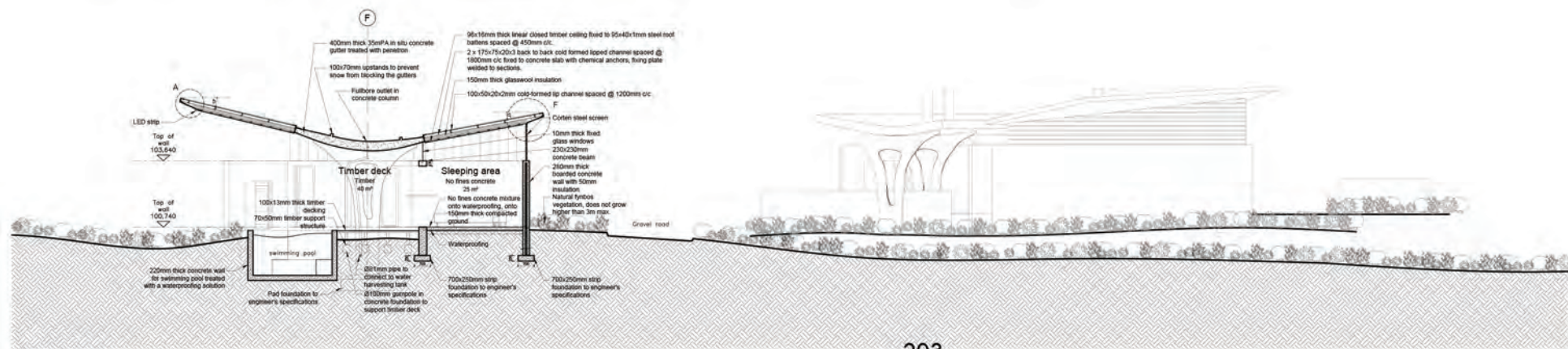
3 elements of structural approach



Stair detail

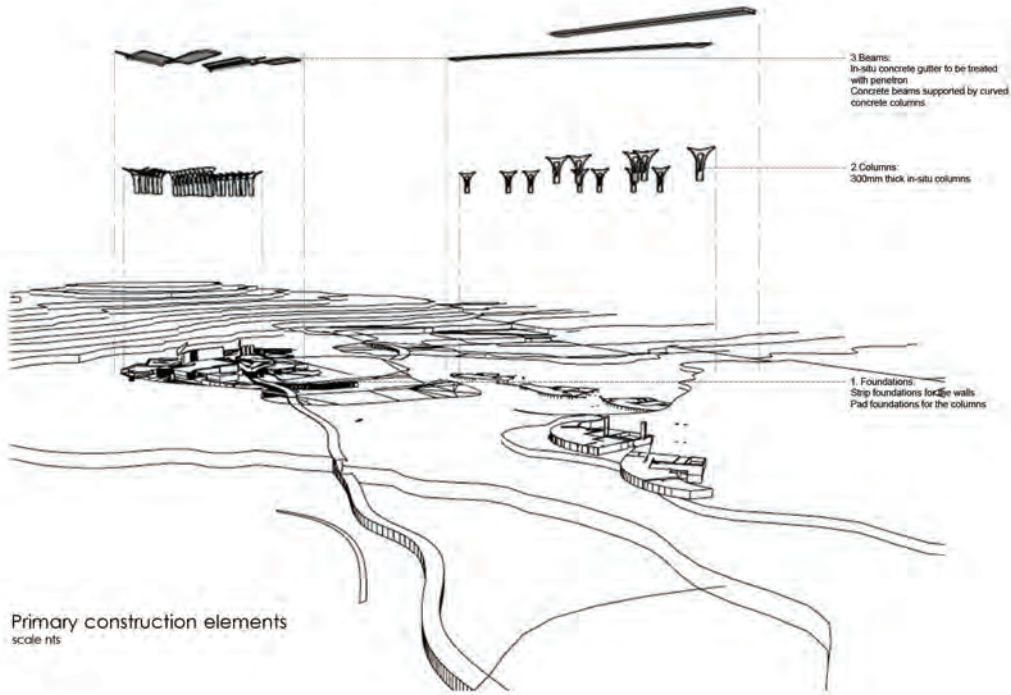


Detail F  
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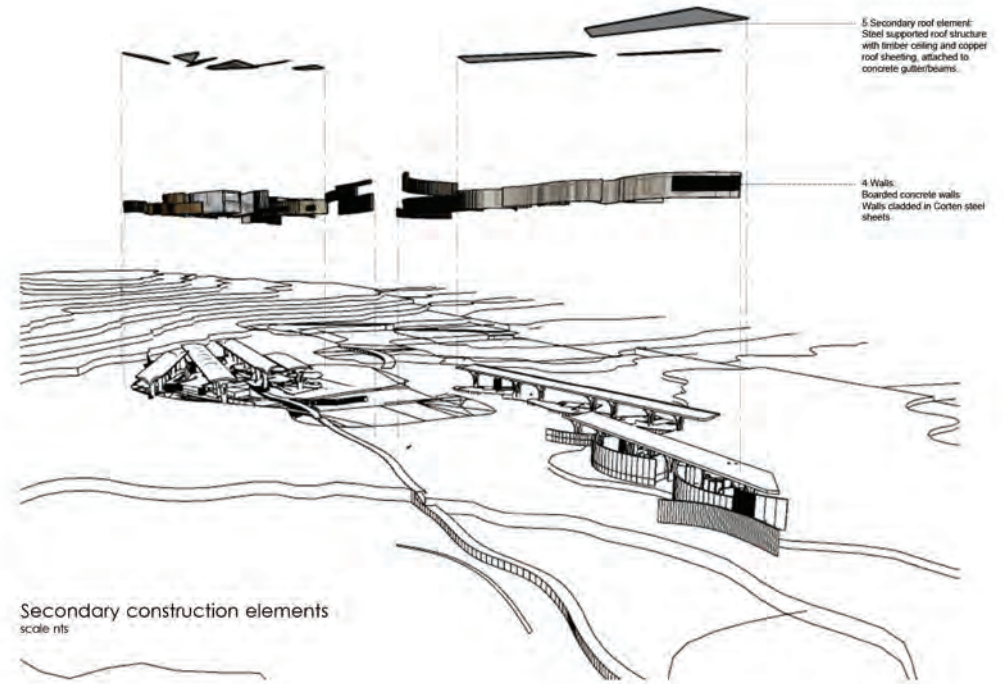


Section H-H  
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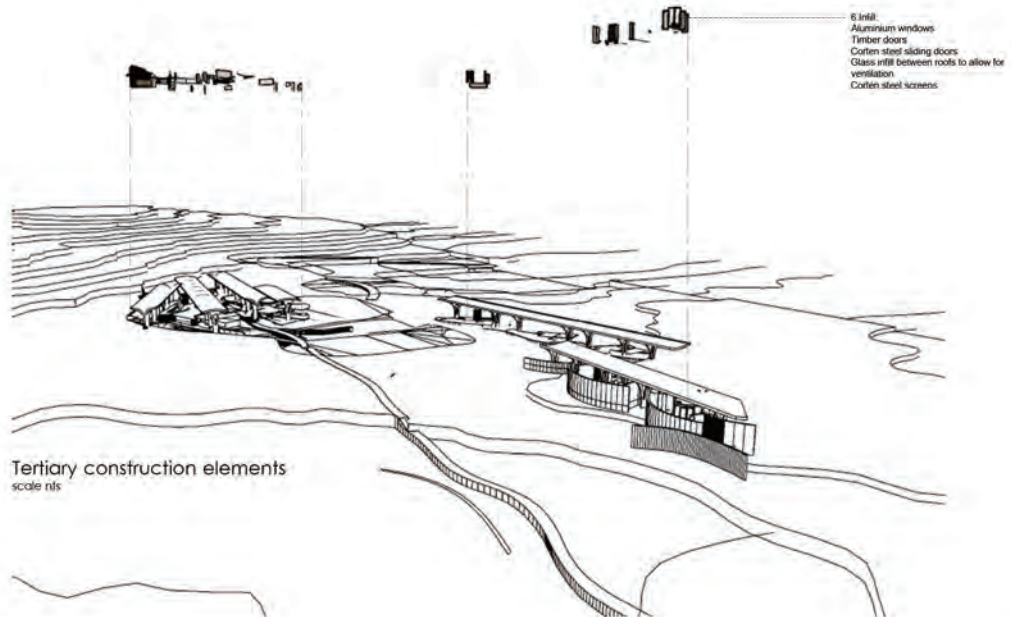
CHRISTELLE LOUW 2018315594	
CLIENT:	Cape Nature
PROJECT:	An interpretation centre for a world heritage site Poetics in the landscape - Disa -
TEAM LEAD:	Section G-G & Section H-H & Detail F
DESIGNER:	CL
DATE:	19.11.2020
PROJECT NO.:	100
WORKING DRAWING NO.:	303
REVISION:	A



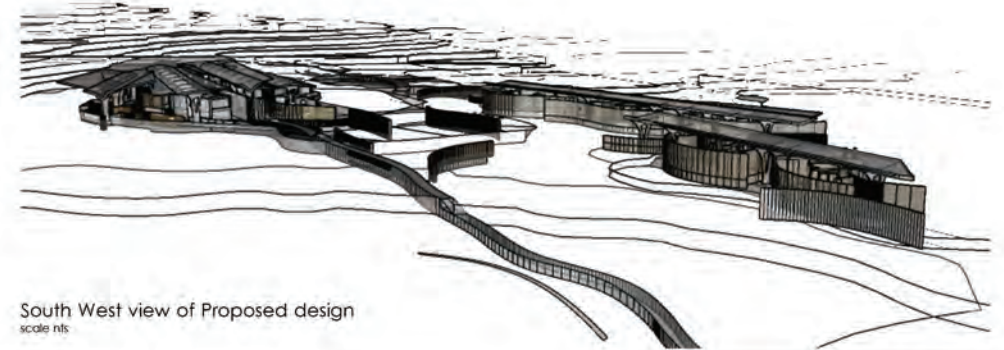
Primary construction elements  
scale n1s



Secondary construction elements  
scale n1s



Tertiary construction elements  
scale n1s



South West view of Proposed design  
scale n1s

CHRISTELLE LOUW  
2018315594

CLIENT / CLIENT:	Cape Nature		
INDUSTRY / PROJECT:	An interpretation centre for a world heritage site Poetics in the landscape - D&A -		
TECHNICAL / DRAWING:	Structural process		
DATE / DATE:	CL	19.11.2020	100
SCALE / SCALE:	CL	401	A



207 **Conclusion**

207 **Reflection**

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# Part four:

## Conclusion



## Conclusion

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The focus of this dissertation is to provide the user with a new perspective to understand the Cederberg. This dissertation only explored a small part of the world's natural environment to search out a design process that is unique to the area. Imagine what architecture could become by exploring more and more of these natural environments and trying to turn its presence into architecture.

## Reflection

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This design process constantly challenged my own perspective on how to approach the design process. It is only natural to fall into old habits, and by always analysing the same basic things of a site, the industry of architecture became so rushed. However, a new lens has unfolded to me in this approach. I hope to forever remember this process (and I'm sure I will) to constantly remind myself to listen and observe nature carefully as it already has all the answers instilled. Whenever I got lost along the way or took the wrong approach, it was because I did not return to the site and take the time to see what it has in store for me. I was constantly challenged to overcome my fear of the unknown and making bold decisions; personally, I like to be safe. However, by doing this, so many more complexities, beauties and ambiguities were revealed to me. The world is always more than it seems, and architecture should be prepared to be sculpted into the new forms that it proposes. The process should be able to grow with it, change with it and to guide the dweller into becoming more aware of their surrounds – conducting a more spiritual awareness of place.



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