

COSMIC PERSPECTIVES

AN ASTRONOMICAL NARRATOSCOPE AT BOYDEN OBSERVATORY USED TO INTERPRET BORROWED
MOMENTS FROM INDIGENOUS COSMOLOGY

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This document is submitted in partial accordance with the requirements of the M. Arch (Prof) degree at the University of the Free State. The research presented is my own work except where mentioned otherwise

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1. PRELUDE

1.1 THE SCIENCE OF POETRY, THE POETRY OF SCIENCE

In the Guardian of 09/12/2011, Ruth Padel wrote the following:

*"Poetry is about feeling, science is about facts. They're nothing to do with each other!" The A-level students in a school I visited last week were passionate on this point. Behind them was Keats, urging them on. "Philosophy," Keats said – meaning science – "would clip an angel's wings." Science was out to dissolve beauty, "Conquer all mysteries by rule and line, / Empty the haunted air and gnomed mine – / Unweave a rainbow ..." Edgar I think this over-romanticises both poetry and science, which have got on fine for two millennia and today are enriching their dialogue. Michael Symmonds Roberts's collection *Corpus* came out of a conversation with scientists mapping the genome. Jo Shapcott's collection *Of Mutability* is expanding poetry's audiences in the medical community.*

Maybe the relationship between poetry and science provokes passion because it is parental. Poetry was the first written way we addressed such questions as what is the world made of, and how did it come to be? In the sixth and fifth centuries BC, the pre-socratics reworked these questions, writing on physics, chemistry, geology, astronomy, theology, metaphysics and epistemology; and often in verse. Science was born in poetry.

*In *Unweaving the Rainbow*, Richard Dawkins does a wonderful job in arguing against Keats that far from destroying beauty, science reveals it.*

But poetry and science have more in common than revealing secrets. Both depend on metaphor, which is as crucial to scientific discovery as it is to lyric. A new metaphor is a new mapping of the world. Even maths uses metaphor; and this is where more condensed forms of poetry join in.

But deeper even than metaphor is the way poetry and science both get at a universal insight or law through the particular. Scientists and poets focus on details. Poetry is the opposite of woolly or vague. Vague poetry is bad poetry – which, as Coleridge said, is not poetry at all. Woolly science is not science.

Poetry might or might not be driven by feeling but what it is "about" is relationships – between word and sound, word and thing, word and thought, sound and meaning, words and other words. So is science. Darwin wondered constantly about the relationships of organic forms.

The deepest thing science and poetry share, perhaps, is the way they can tolerate uncertainty. They have a modesty in common: they do not have to say they're right. True, perhaps. Or just truer. "A scientist should be the first to say he doesn't know," a tiger biologist told me when I asked some detail of tiger behaviour. "A scientist goes forward towards truth but never gets there." (Padel, 2011: 1).

1.2 INSIGHTS

It is clear that even though science and poetry is different in many aspects, they are also similar in many ways, like the revealing of secrets, the relationship of things, the tolerance of uncertainty and the attainment of universal insight through the particular.

I found it intriguing that there is a parental relationship between science and poetry, the fact that poetry was the first way to try and explain existence and the universe and was only later taken up by people of science to try and answer these questions. The poetry lead to science and was parental to science. Poetry is historically connected to science .

1.3 A POEM BY KABBO

The milky way and the stars:

The wood ashes that lie here must become the milky way
they must lie along the sky
that there are stars that stand outside of the milky way
while the milky way remains the milky way
The milky way must go round with the stars
while the stars sail along
they sail along on their footprints
which they, sailing along, are following
the sky lies still

The stars have turned around
the stars are those which go along
while they feel that they sail along on their footprints
The stars become white when the sun comes out
the stars wax red when the darknes comes out.
people go by night when the ground is made light
when the milky way gently glows
The milky way must white lie along the sky
while it feels that it is wood ashes
the earth would not have been so light
had not the milky way been the milky way,it and the stars
(Krog, 2004: 64).

1.4 INSIGHTS

My first observation is that there exists a narrative that the purpose of the milky way is to lie across the sky to provide light in the darkness and provide the people with a path to walk to find their way in the dark as said in the poem; "*people go by night when the ground is made light when the milky way gently glows.*" This narrative is also prevalent in another poem by the Xam which goes, "*The milky way formed as a path of wood ashes.*" (Shapera, 1965: 450; Krog, 2004: 64).

My second observation was that the milky way and the stars surrounding it is strongly connected in stories from indigenous cosmology. Examples of these stories are found in stories of the Xam which states *that the creation of the milky Way presupposed the creation of the other stars.*" The milky way and the stars move with each other as stated in the poem by Kabbo. In the poem of Kabbo, the milky way and the stars, the milky way is seen as going around with the stars and the stars is said to sail along (Krog, 2004: 64).

2.1 THE CONTEXT OF SCIENCE

2.1.1 HISTORY OF ASTRONOMY IN SOUTH AFRICA

South Africa has a rich heritage of astronomical observation, hence our position as a global leader in the field. The first astronomers of South Africa were dedicated to solving navigational problems in order to secure the safe movement of maritime traffic along the coast which was a big obstacle at the time leading to a lot of ship wrecks along the coastline of South Africa (Miley, 2011: online).

The accurate positions of the Southern stars and the positioning of the African coastline would have been useful for navigators, but this was not well known. At this time trigonometrical surveys were carried out by these astronomers. This led to the establishment of a vast network of lighthouses along South Africa's coast.

The first permanent astronomical observatory in the Southern Hemisphere, the Royal Observatory, was built in Cape Town, South Africa. The reason for this was the easy access Northern hemisphere astronomers had to Cape Town. Only a few years later, the highveld was exploited for astronomical observation due to the superior observing conditions (SAAO, 2019: online).

By the 1920's South Africa was recognized as a choice astronomy observing location internationally. Michigan, Yale, Harvard and Leiden's observatories established southern stations in the country. Because of the clear skies of the region, other countries such as Namibia utilized this. Namibia hosted a number of German sponsored observatories. The clear skies that the Cape experienced in the early days inspired Sir John Herschel, the celebrated astronomer, to notice that Venus shone very brightly and the moon gave off exceptionally bright light in the region (Miley, 2011: online).

The term constellation is a notion from the Northern hemisphere. Constellations are seen the other way around in the Southern hemisphere. Some constellations that are only visible in the Southern hemisphere, are indigenous. Colonel Robert Jacob Gordon was also inspired by the local atmosphere and found the zodiacal light, the yellowish glow in the sky after sunset, to be very pronounced. It is clear that the clear skies of South Africa aided all the people who looked for meaning in the stars (Alcock, 2012: 225).



Fig 1. A settlers hut in the 1920's serving as the first Royal Observatory (SAAO, 2019: online).



Fig 2. Royal observatory next to devils peak, Cape Town 1834 (SAAO, 2019: online).

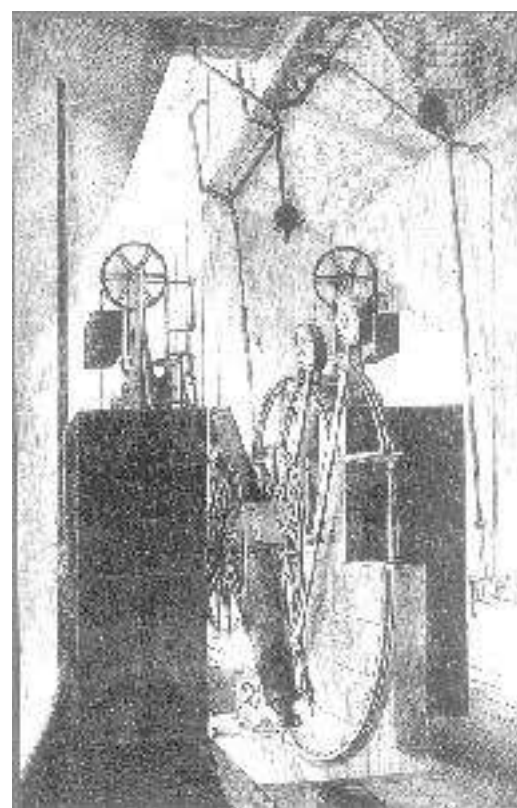


Fig 3. The Airy transit circle installed at the Cape in 1855. This instrument was used to measure star positions until 1905 (SAAO, 2019: online).

2.2 THESIS STRUCTURE

In this thesis the macro site will first be discussed, followed by the micro site analysis and the Boyden Observatory. The touchstone and concepts will be discussed in relation to the site. . I will focus on South African indigenous cosmology concerning specific constellations, stars and galaxies that are prominent in South Africa.

In the section of this thesis where the focus is on indigenous cosmology, the research will be presented in the following order. First I will identify the topic of discussion, for example the Pleiades. Then I will share the stories of various prominent South African cultures regarding the Pleiades. Finally I will spatially interpret these stories. I will frame the intangible.

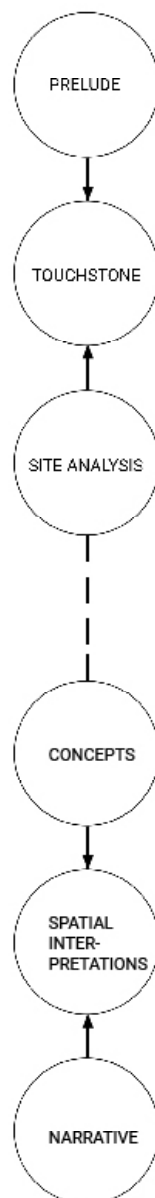


Fig 4: Diagram of the Thesis structure

3. THE TOUCHSTONE



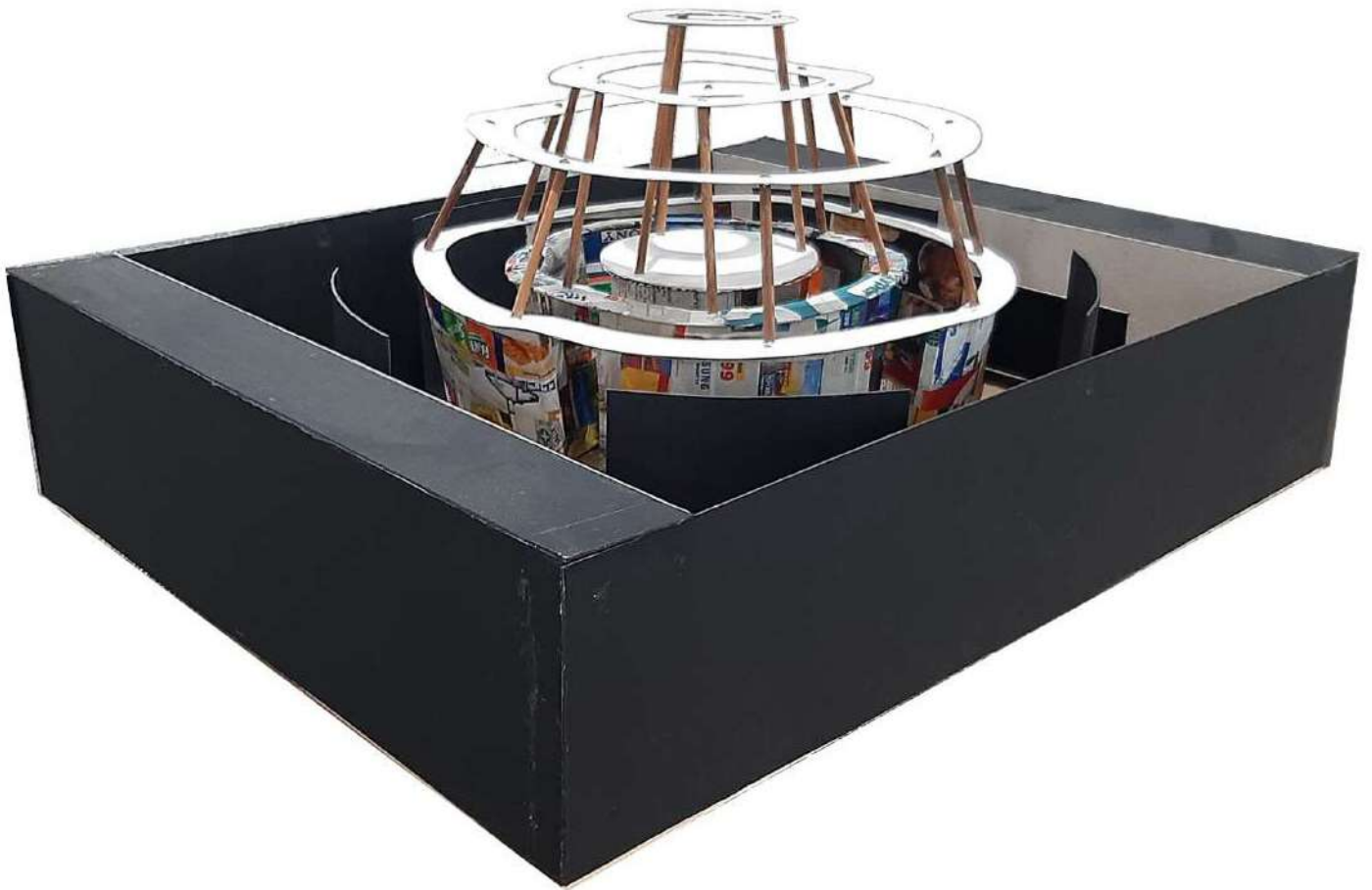


Fig 5. The touchstone

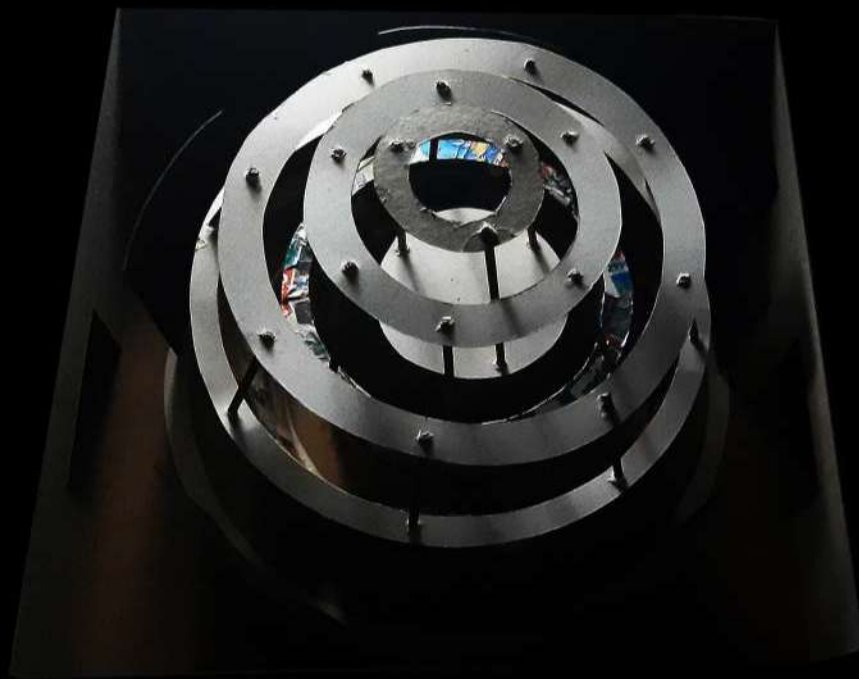


Fig 6. Touchstone illuminated from the exterior which resembles science.



3.1 INSPIRATION OF THE TOUCHSTONE

The touchstone is resembling science and feeling. It resembles the subjective nature of folklore, and the objective nature of science. The touchstone takes on the form of a labyrinth. This symbolizes the nature of science and indigenous cosmology, which is the search of truths.

This touchstone is inspired by what I experienced on the site, which was that the science was what is already on site; this is the Boyden Observatory. But the story that I want to tell is the story of folklore, which deals more with human experience and feeling regarding the stars, and what they mean rather than objective truth.

Folklore also allows for different interpretations regarding the meaning of the stars and often has a direct connection to the landscape and natural events experienced specifically in South Africa. Indigenous cultures often told stories of the stars that relate to their current landscape or natural events. An example of this is Orion, which meant that three wild pigs were chased by a wild dog, or the redness of the moon resembling the red dust landscape of the region (Alcock, 2014: 249).

The objective science and subjective folklore viewed together creates a richer experience for contemporary stargazers.

The science help us to understand the physics of the universe and try to answer questions such as, how old are we? What is the eventual fate of the universe? What are the intricacies of our universe, and could another universe ever exist?

The folklore encourage storytelling which gives South African cultures identity. The folklore often explains the African landscape and tales are often rooted in natural events specific to South Africa. A lot of moral values are also embedded within folklore which imparts good values to a variety of cultures in South Africa

3.2 THE TOUCHSTONE AS THEATRE

The touchstone is a theatrical experience created by light that shines from two locations independently. When the light shines from the outside of the touchstone, the touchstone represents science. The light that is shining from the side of the touchstone is not manipulated by the movement of the touchstone and resembles objective science. The person manipulating the touchstone does it in a subjective way which introduces feeling to the theatrical experience.

The theatre comes into play when light is shining from the inside of the touchstone. The touchstone has circular walls that can move. The light that shines from the centre of the touchstone falls on different parts of the walls, as these walls move. On these walls are stories and narratives. This light theatre represents the Folklore.

The way the touchstone operates is an interpretation of how folklore is experienced. The walls of the touchstone can be manipulated by the viewer; this allows the light to fall on different narratives that are located on the walls. The moving walls of the touchstone represent the subjective nature of these stories, as different cultures have different explanations for the same constellations or stars. The light shining from the centre represents the "truth" which falls on different narratives as the walls are manipulated. The touchstone is a search for truth, but the viewer soon discovers that there are multiple truths and that these individual stories have importance.



4. GLOSSARY

NARRATOSCOPE: The word narratoscope is a neologism. It is a combination of the word narrative and telescope.

An architectural narratoscope is space dedicated to stimulate discovery and imagination through the framing of cosmic perspectives and the spacial intepretation of stories. Framing of cosmic perspectives has a direct correlation with the word telescope and the spacial interpretation of stories has a direct correlation with narrative design. Hence the word narratoscope is used to describe architecture that succeeds in achieving these outcomes.

BORROWED MOMENTS: When referring to borrowed moments in the text, it refers to certain selected stories told by indigenous cultures. In no way a wholistic explanation of what certain indigenous cultures believe regarding cosmology is given. Only selected parts of an indigenous culture's belief's and stories is highlighted, hence the term moments is used.

INDIGENOUS COSMOLOGY: When using the term indigenous, reference is made to the people that are indigenous to South Africa. In this thesis reference is made to some of the indigenous cultures of South Africa. Cosmology is a field of study occupied with the universe. Indigenous cultures often used poetry, stories and folklore to understand the universe. In this thesis, selected parts of poetry, stories and folklore are discussed.

INNER SPACE: Inner space can refer to one's inner self or a human's mind, which is regarded to be as unfathomable as space. It refers to the part of the mind that is not normally accessable to consciousness.



5.SITE ANALYSIS



5.1 SITE OBSERVATION

5.1.1 THE CHARACTERISTICS OF THE SITE

The site is located in close proximity to the Maselspoort Resort and about 24km from the Bloemfontein CBD. To get access to the Boyden Observatory one has to travel up a steep slope of a hill until one eventually reaches the observatory which is located on top of the hill. On the site, the most obvious natural features are the two prominent hills connected by a saddle. On the one hill the Boyden Astronomical Observatory is located while the other hill has not undergone any built development. The site which is located on a hill provides views of prominent natural features in all four directions. These features are the mountains in the north, the Modder River in the east, a large expanse of veld in the south and farmlands to the west.

5.1.2 LOCATION OF THE BOYDEN OBSERVATORY AND LIGHT POLLUTION

The Boyden Observatory is located far enough from Bloemfontein to avoid light pollution but also close enough to have access to resources from the city. It is important to consider the influence artificial light has on astro photography. Any additions or extra buildings built close to the Observatory has to be carefully planned in order to minimize the amount of light pollution in the area.

5.1.3 REASONS FOR VISITING THE BOYDEN OBSERVATORY

The public visits the Boyden Observatory to gain knowledge on astronomy. The observatory hosts open evenings, and showcases digital presentations to fulfill this need. The observatory also allows people to look at the stars through telescopes. In addition to this Boyden provides access to an education hall that showcases the development of telescopes and related instruments, the history of Boyden as well as a timeline of astronomical discoveries.

5.1.4 THE ASPIRATIONS OF THE BOYDEN ESTABLISHMENT

Due to the increasing number of people that visit the Boyden Observatory, there has been talk of architectural extensions on the site to provide people with a more wholistic experience of the universe and to cater for the the sheer increasing number of people that visit Boyden.

5.1.5 TOWARDS AN ARCHITECTURAL EXTENTION OF BOYDEN THAT IS COMPLIMENTARY TO THE EXISTING AND THAT MEETS THE ASPIRATIONS OF THE BOYDEN ESTABLISHMENT

It becomes clear that if there were to be an architectural extention of Boyden to cater for the increasing number of people visiting Boyden, it should be complimentary to what is already happening at the Boyden establishment. The aim of this extention is to enrich the current experience visitors get from visiting Boyden. It therefore seems fit for an architectural proposal to enrich people's experience of astronomy.

5.1.6 ARCHITECTURAL STRATEGY

The Boyden establishment is optimistic for the extension of their facilities to accommodate and inspire the increasing number of people that visit the Boyden Observatory. The architectural project proposed is an astronomical narratoscope. The goal of this narratoscope is to provide the contemporary stargazer with an enriched perspective of outer and inner space.

5.1.7 THE CURRENT BOYDEN EXPERIENCE

In order to give the contemporary stargazer an enriched experience of outer and inner space as well as an enriched experience of Boyden, it is important to identify what experience the Boyden Observatory already offers. The observatory offers in depth scientific research and presentations of subjects such as Venus, Mars and the milky way. The history of the observatory is also exhibited in the existing education hall. People are also able to view stars through the existing telescope. The experience I had at Boyden was that of education. The education of science, scientific discoveries, education on the expanse and intricacies of the universe.

5.1.8 POSSIBLE WAYS OF ENRICHING THE CURRENT EXPERIENCE OF BOYDEN

A possible way of enriching the current experience of scientific education is to add a layer of education that deals with South African astronomical poetry, folklore and stories. An avenue of investigation that seemed appropriate was the study of South African indigenous cosmology. This layer of education can then be exhibited in architecture that is a spatial interpretation of borrowed moments from indigenous cosmology.

5.1.9 SIGNIFICANCE OF THE INTERVENTION

What is significant of this intervention is that there is an astronomical Observatory located on the site that is dedicated to provide the public with scientific research and education. This caters for a select few individuals that are interested in the scientific and factual realm of the universe. The aim of this proposal is to be more inclusive towards stargazers that are more interested in aspects of the universe that are not necessarily factual or scientific but rather mythical. The aim of the proposal is to provide the public with an experiential education of the universe focused on indigenous cosmology which would make the astronomical observatory more inclusive and comprehensive regarding the experience and education the visitors receive. The proposal will add an experience to Boyden that is currently lacking.

5.1.10 RESEARCH QUESTION

How can an astronomical narratoscope provide the contemporary stargazer with an enriched perspective of outer and inner space?

5.2 MACRO SITE ANALYSIS

5.2.1 BOYDEN OBSERVATORY

The Boyden Observatory provides the public with scientific exposure and education and is dedicated to the observation of celestial objects.

5.2.2 MASELSPOORT ROAD

This road is a direct connection between the airport and the Boyden Observatory. People from Bloemfontein also use this road to access Maselspoort.

5.2.3 FARMS

When travelling from Bloemfontein or the Airport to Maselspoort, one is surrounded by great open grasslands and farms. One experiences the iconic grass planes of the Free State.

5.2.4 BRAAM FISCHER AIRPORT

This is a primary airport situated in Bloemfontein. The close proximity of the airport to the Boyden observatory provides visitors from other provinces with easy access to the site.

5.2.5 BLOEMFONTEIN CBD

Bloemfontein CBD is situated about 26 km from the Boyden Observatory. The distance between Bloemfontein CBD and the Observatory prevents the light pollution emitted from the city from affecting astrophotography and stargazing from the Boyden Observatory.

5.3 SURROUNDING CONTEXT



5.3.1 HILLS

Hills that are aligned in a linear pattern are located to the north from the site. These hills are connected by a ridge.

5.3.2 THE MODDERRIVIER

From the perspective of the site, the Modder River can be seen in the north all the way to the east.

5.3.3 MASELSPOORT RESORT

The Maselspoort resort is a big attraction for people wanting to go fishing or camping with family and friends.

5.3.4 SITE

The site is located on a natural saddle between the Boyden Observatory and a natural hill located to the east from the observatory.

5.3.5 THE BOYDEN OBSERVATORY

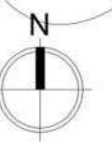
The Boyden Observatory is located on a hill from where one can see Maselspoort and the Modder River to the north and vast grass planes to the south.

5.3.6 FARMS

Farms are located alongside the road that leads to Maselspoort from the airport.

Fig 10. Aerial map of the surrounding context (Google Earth, 2021: online).

5.4 MICRO SITE ANALYSIS
5.4.1 ENTIRE SITE



- 1. Entrance road connected to the Maselspoort road
- 2. Bus parking
- 3. Visitors parking
- 4. Natural ridge
- 5. Natural saddle
- 6. Hill

5.4.2 THE LAYOUT OF THE BOYDEN OBSERVATORY

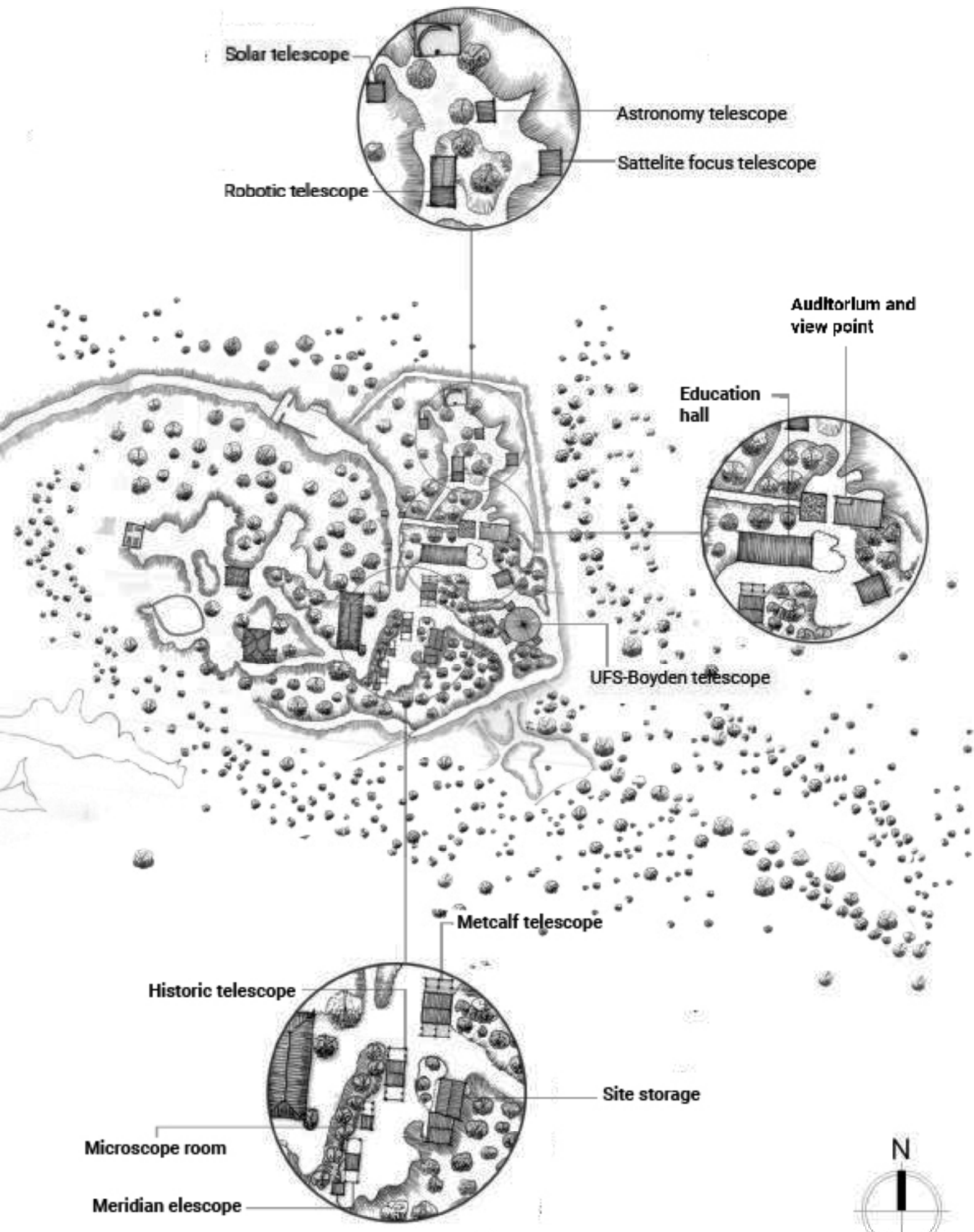




Fig 11. Site and surrounding context (Google Earth, 2021: online)

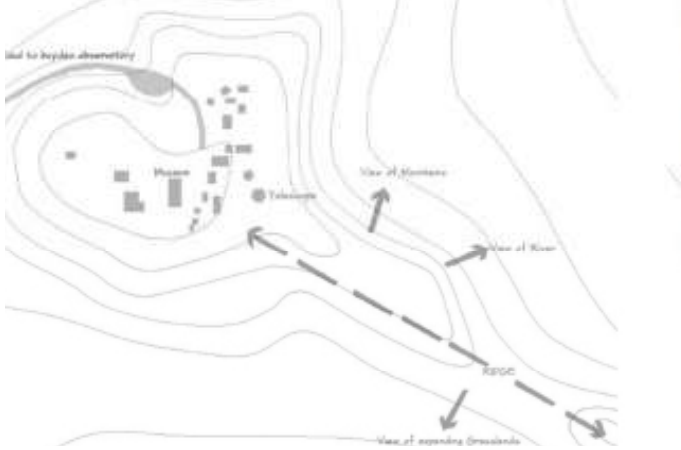


Fig 12. Views from the site to the surrounding context.

5.5 OVERVIEW OF THE SITE

The site is located near Maselspoort and surrounds the Boyden Observatory. On the site there are two hills. There is a natural saddle connecting the two hills. The site is suitable for stargazers as there is not as much light pollution as in the city, which would enhance the experience of stargazing.

In addition to the study of stars, the observatory is frequently hosting educational programmes to the public, including students and the youth. This is done in the form of open evenings and digital presentations, which include themes such as human robotic spaceflight, the exploration of planets and astronomical themes such as the solar system and Mars.

The site is favourable as there are programmes in place to provide the public with scientific education and exposure, but more importantly, the site is suitable for the introduction of an exhibition route to help evoke a greater perspective for the contemporary people. This would be achieved by using borrowed instances from indigenous cosmology that will add a new layer of experience when visiting Boyden.

The site chosen for this project is located near Maselspoort at the Boyden Observatory. The site is at a low part of a ridge between two higher peaks, this is referred to as a saddle. The saddle joins the peak on which the Boyden Observatory is located and another peak located towards the east from the Boyden Observatory.

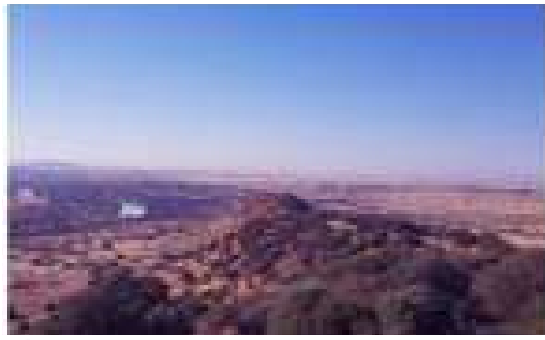


Fig 13. Ridge located near the observatory (Google Maps, 2021: online)



Fig 14. Boyden observatory (UFS, 2021: online).



Fig 15. Telescope (Wilna, 2019: online.)



Fig 16. Students visiting the library. (Wilna, 2019: online).

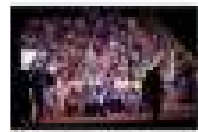


Fig 17. Open evenings (Wilna, 2019: online).



Fig 18. Digital presentations (Wilna, 2019: online).

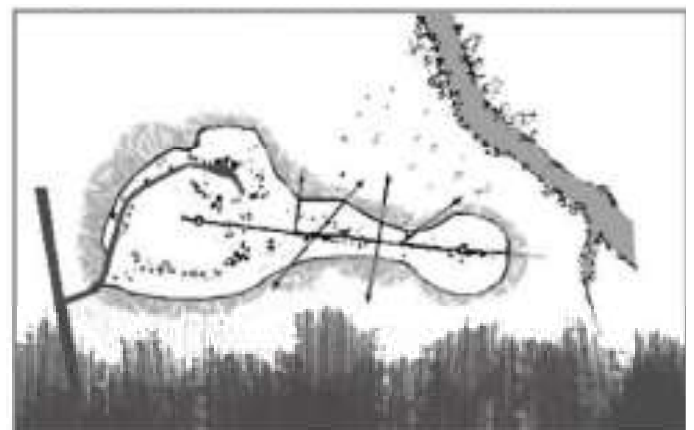
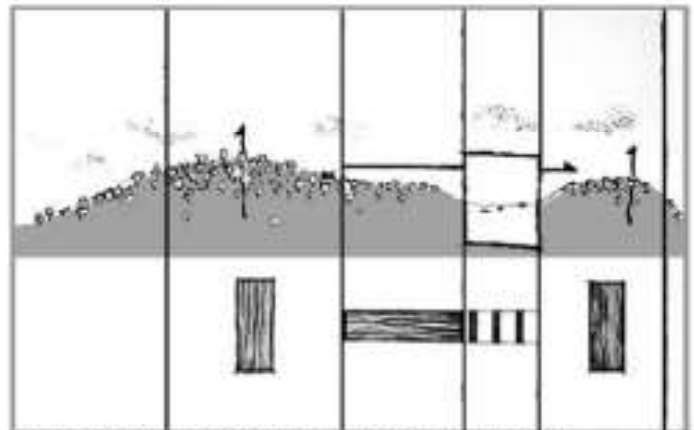


Fig 19. Interpretation of the site

5.6 SITE DRAWINGS



Fig 20. Vertical and horizontal elements on site

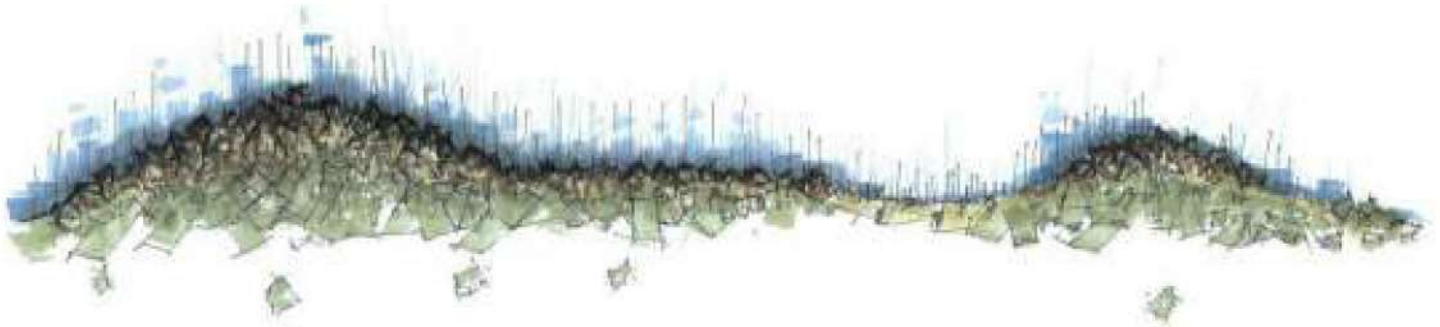


Fig 21. Concentration of vegetation and built form on top of the hill



Fig 22. Grass revealing paths

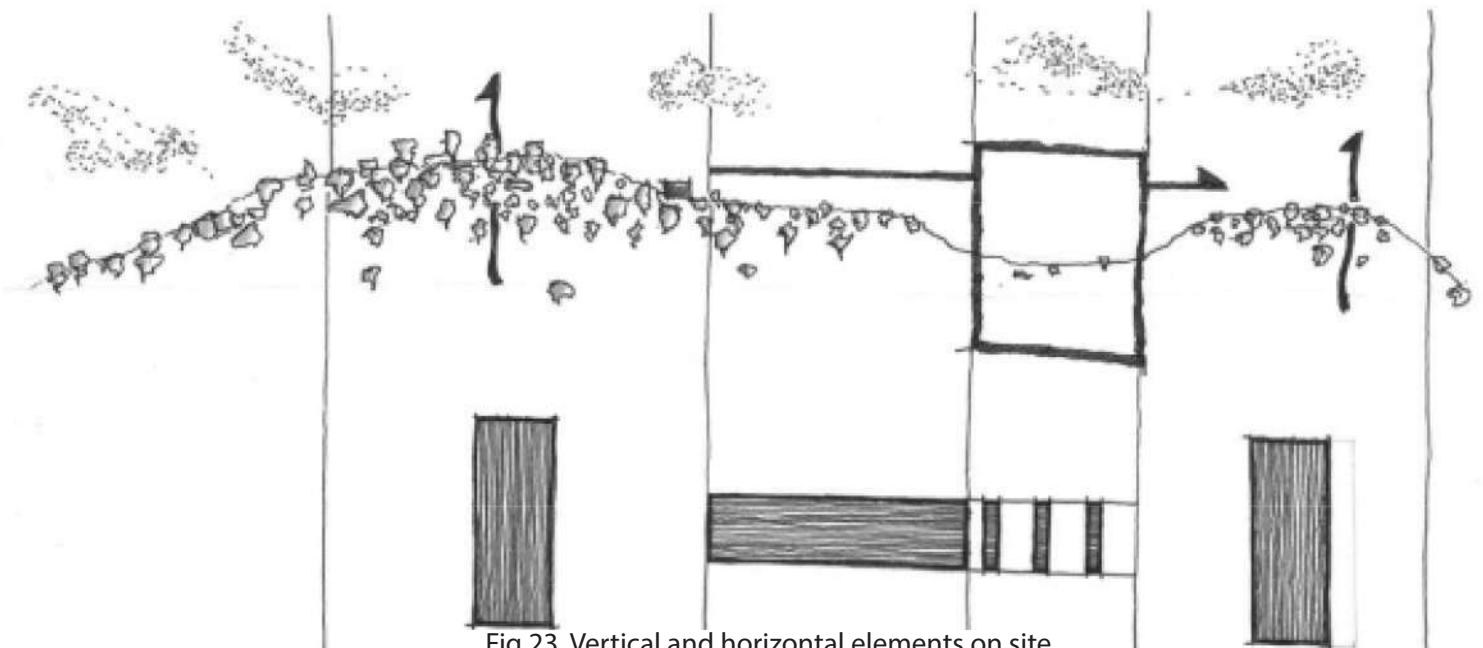


Fig 23. Vertical and horizontal elements on site

5.7 SITE MODEL

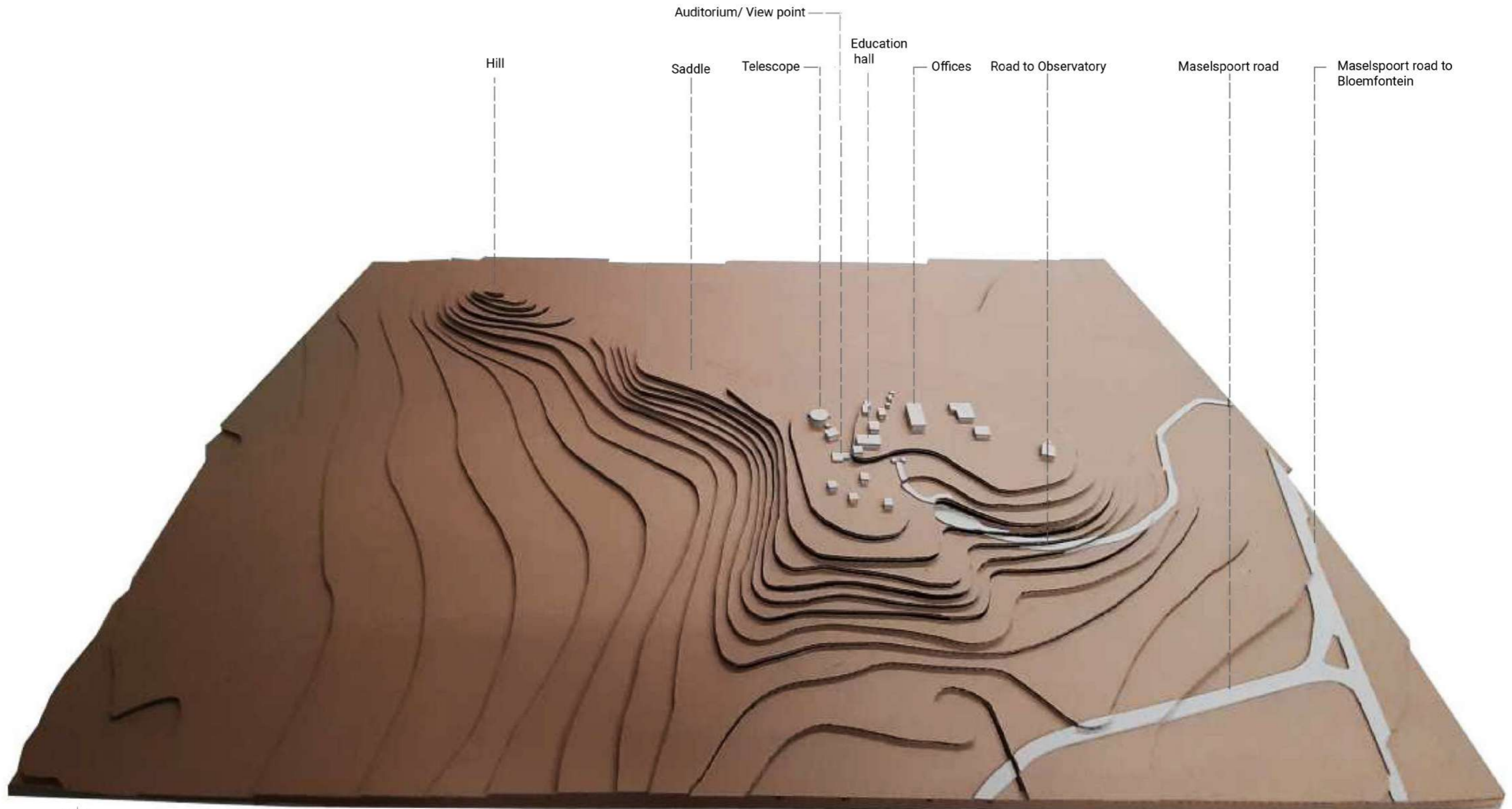


Fig 24. The site model



6. CONCEPTS



6.1 NOTATION OF STORIES

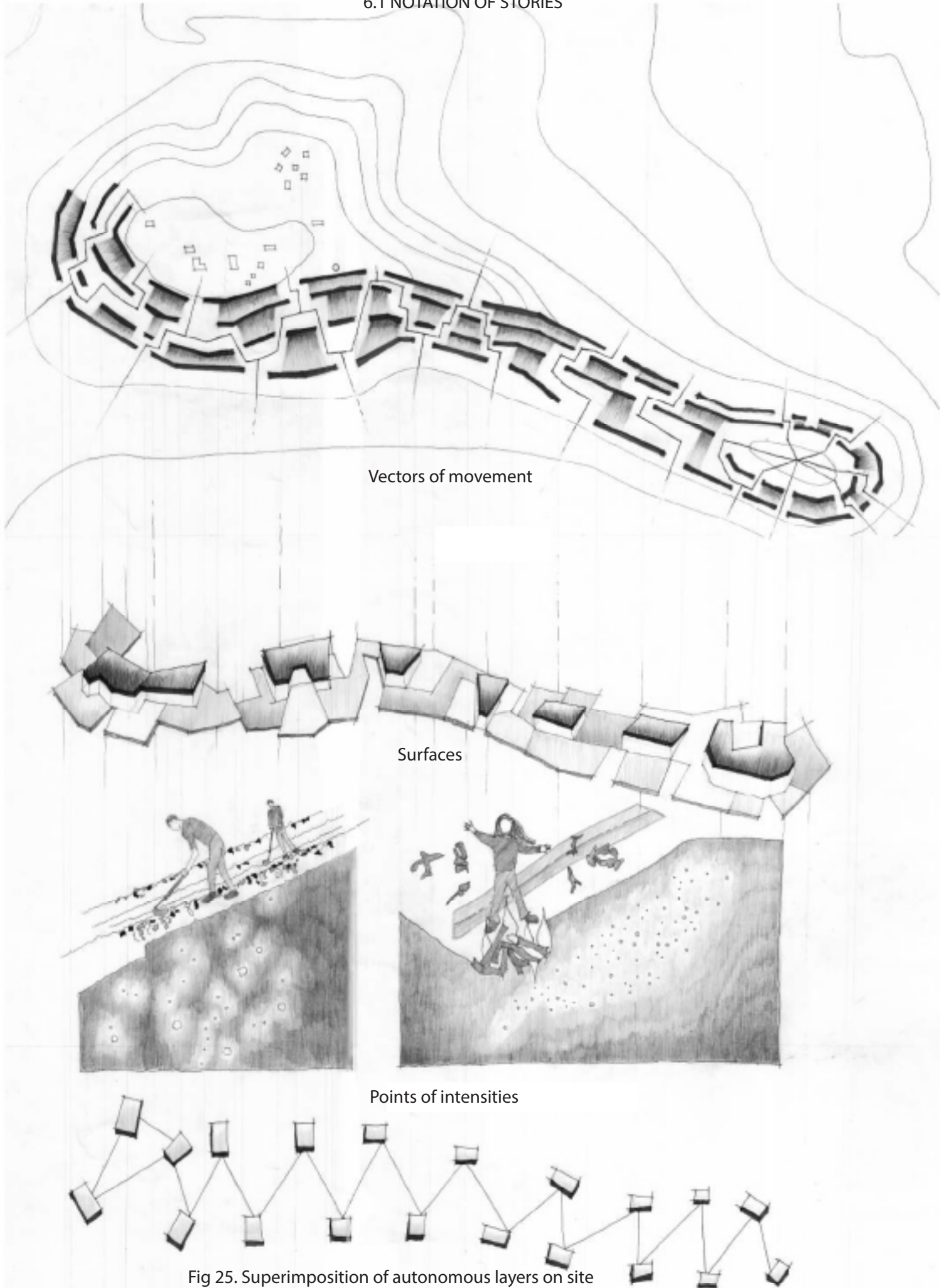


Fig 25. Superimposition of autonomous layers on site

6.1.1 MEANING OF NOTATION OF STORIES

The concept of notation can be divided into three parts, namely: points of activities or intensities, vectors of movement and surfaces where random activities happen. According to Bernard Tschumi this concept does not help architecture to be contextual but rather it helps architecture to contextualize a concept.

“What if architecture is as much about movement and events as about space.”-Bernard Tschumi.

Bernard Tschumi goes on to say that the movements themselves had something to do with architecture itself, that architecture itself was not static, but it was rather a repository of movements. A formalisation of movements and function (Tschumi, 2007: Lecture).

With the proposed exhibition route the three parts of the concept of notation is organized as follows:

-The points of intensities are the exhibition spaces that are designed through the use of borrowed instances from indigenous cosmology

-The vectors of movement are divided into the main axis, which is the datum on which the other routes are organized, and the other axes that overlap the organizational axis and is directed to specific views on site and the direction of gal-axies, constellations and planets.

-The surfaces facilitating randomness are the gathering spaces located on the organizational axis. The gathering spaces are provided for telling and listening to stories, existing and made up, allowing for a certain randomness and freedom of the improvisation of storytelling, and the sharing of different views on the stars.



Fig 26. Model indicating the layering of the autonomous layers of points lines and planes to create a third un-
seen experience



Fig 27. Grass surfaces for random activities at Park de la Vilette (World for Travel, 2017: online).



Fig 28. Follies at Park de la Vilette which are the points of intensities (Lefranc, 2019: online).



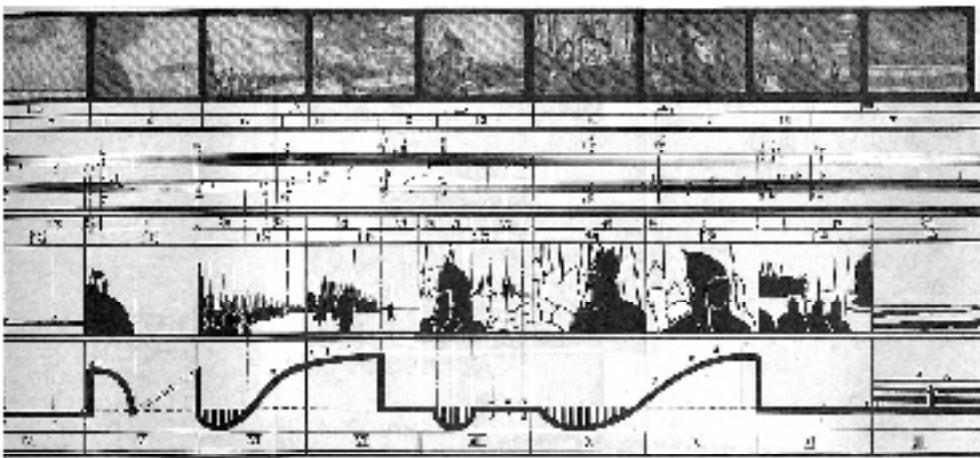
Fig 29. Ariel view of Park de la Vilette displaying vectors of movement (Morval, 2020: online).

6.1.3 THE INSPIRATION OF BERNARD TSCHUMI: SERGAI EISENSTEIN

According to Eisenstein, montage is the combining of shots that are depictive, singular in its meaning and neutral in content into intellectual contexts and series. This means that two neutral images are colliding to illustrate a third undepictable thing. Eisenstein uses five methods of montage. Metric montage is the cutting of film to exact measurement, irregardless of content. This could create movie scenes that create a sense of chaos. Rhythmic montage is the cutting according to the content of the shots, also called continuity editing. Tonal montage is the cutting according to emotional tone of a piece where tone could be any visual or oral characteristic that different shots could share in common. It could for example be a motif of voggyness of haze that unifies two shots. Intellectual montage is the cutting according to a shots relationship to an intellectual concept. Overtonal montage is the combination of metric, rhythmic and tonal montages (Charles, 2017: online).



Fig 30. Sergai Eisenstein (Vassilieva, 2017: online).



— Picture frames
 — Music phases
 Diagram of pictoral composition
 — Diagram of movement

Fig 31. Sequence diagrams for Alexander Nevsky and Battleship Potemkin by Sergai Eisenstein (Lucarelli, 2011: online).

6.1.4 APPLICATION OF THE CONCEPT: NOTATION-PARK DE LA VILETTE

Bernard Tschumi worked with the concept of notation rather than representation, the idea that architecture should not be represented as merely perspective drawings, but through drawings that show movement, time and action. Park de la Vilette uses the concept of the superimposition of three autonomous systems which are points, lines and planes. Bernard Tschumi was fascinated by film, as it was action within a space that is transposed on to a flat screen. He was especially fascinated by the sequence drawings of Sergai Eisenstein, and how it is different from the typical drawings architects make like axonometrics, perspectives ,sections and plans (Tschumi, 2007: online).

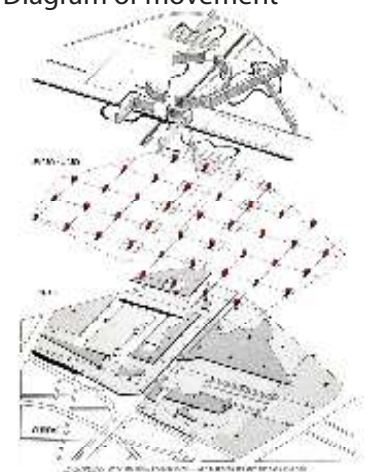
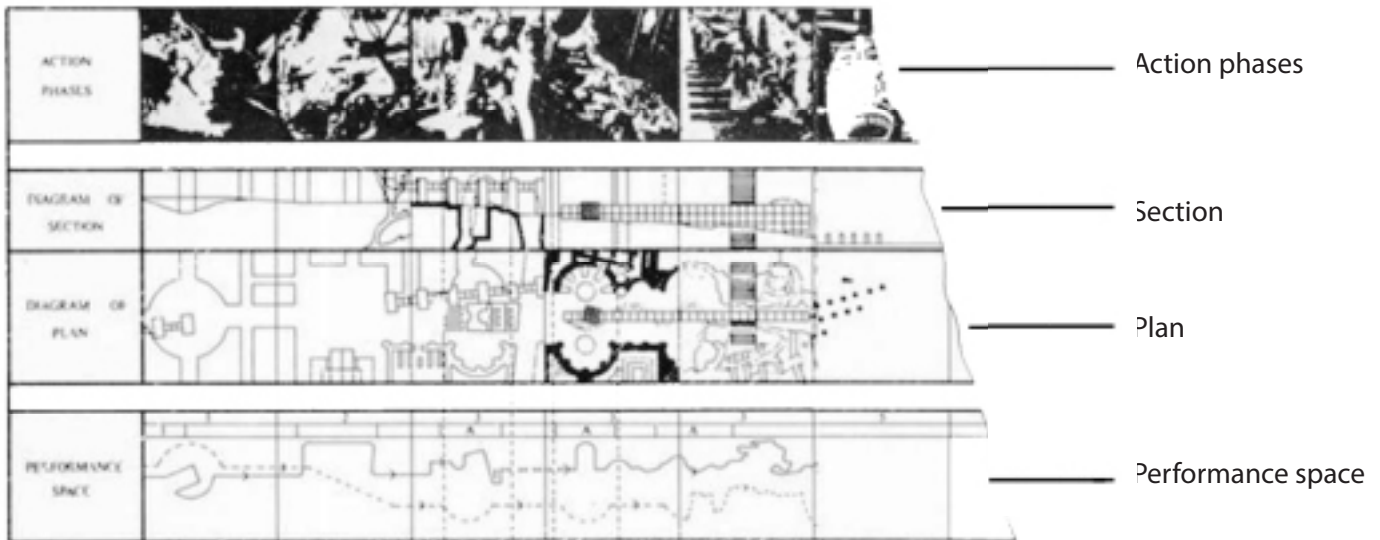


Fig 32. Superimposition of autonomous layers at Park de la Vilette (Morval, 2020: online).



Homage to Eisenstein, 1977. Part of Joyce's Garden

Fig 33. Bernard Tschumi drawings of Joyce's Garden inspired by Silgai Eisenstein (Lucarelli, 2011: online).

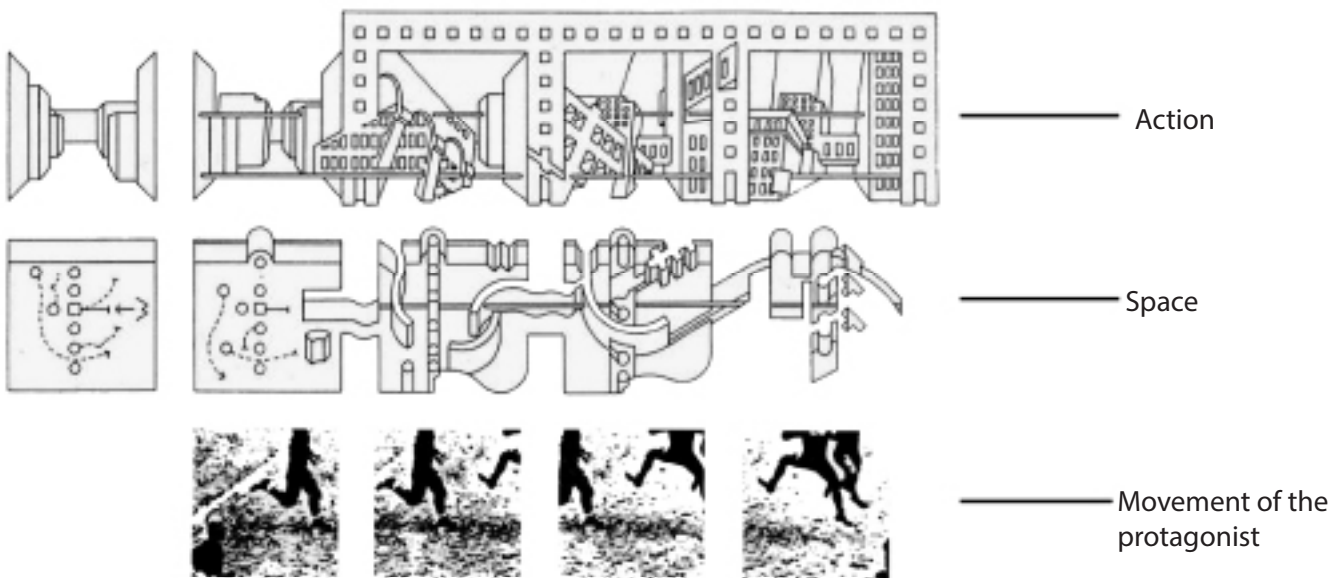


Fig 34. Tripod notation by Bernard Tschumi of The Block (Lucarelli, 2011: online).

These drawings forces one not to look at it as an image but rather movement in time - Bernard Tschumi.

According to Tschumi, the thing that is particular to every image is that they are about the line, the two-dimensional line on a piece of paper. Inevitably it is frustrating when one asks oneself if these lines can develop by constructing things (Tschumi, 2016: online).

6.1.5 ARCHITECTURE AS SPACE, EVENT AND MOVEMENT: PARK DE LA VILETTE

6.1.5.1 SUPERIMPOSITION OF THREE AUTONOMOUS LAYERS

Besides the point grid of Park de la Vilette, there were two other aspects that were just as important to Tschumi. This was the movements and planes. The planes were the places of improvisation or randomness. The park was a result of Bernard Tschumi's experimentation with the Manhattan conscript.

The idea of movement that can be fast, slow, intense or light and trying to find modes of notation for movement and translating it into built form. In this way Bernard Tschumi could translate two dimensional drawings into built form through Notation (Tschumi, 2016: online).

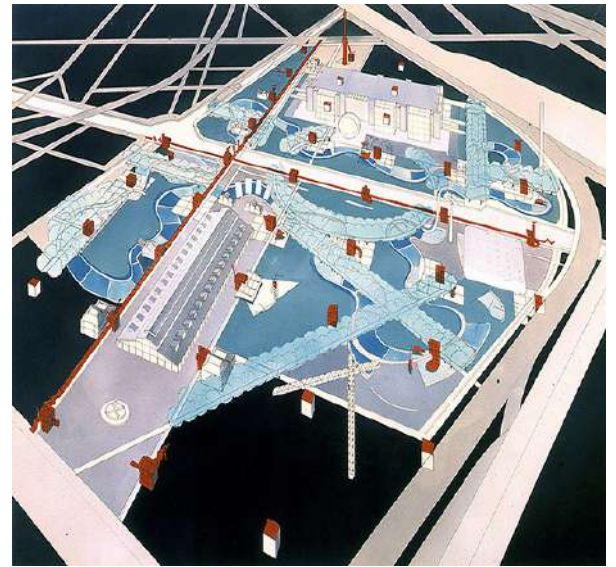


Fig 35. Park de la Vilette: Points, lines and planes overlaid on top of each other (Deara, 2015: online).

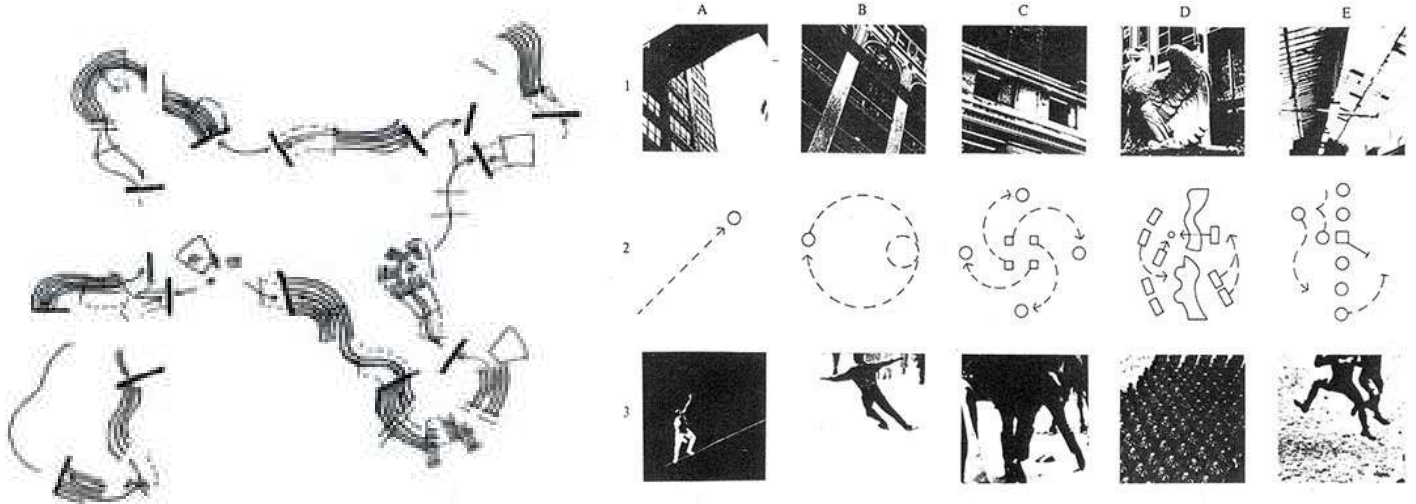


Fig 36. Drawings of movement by Tschumi (Lucarelli, 2011: online).

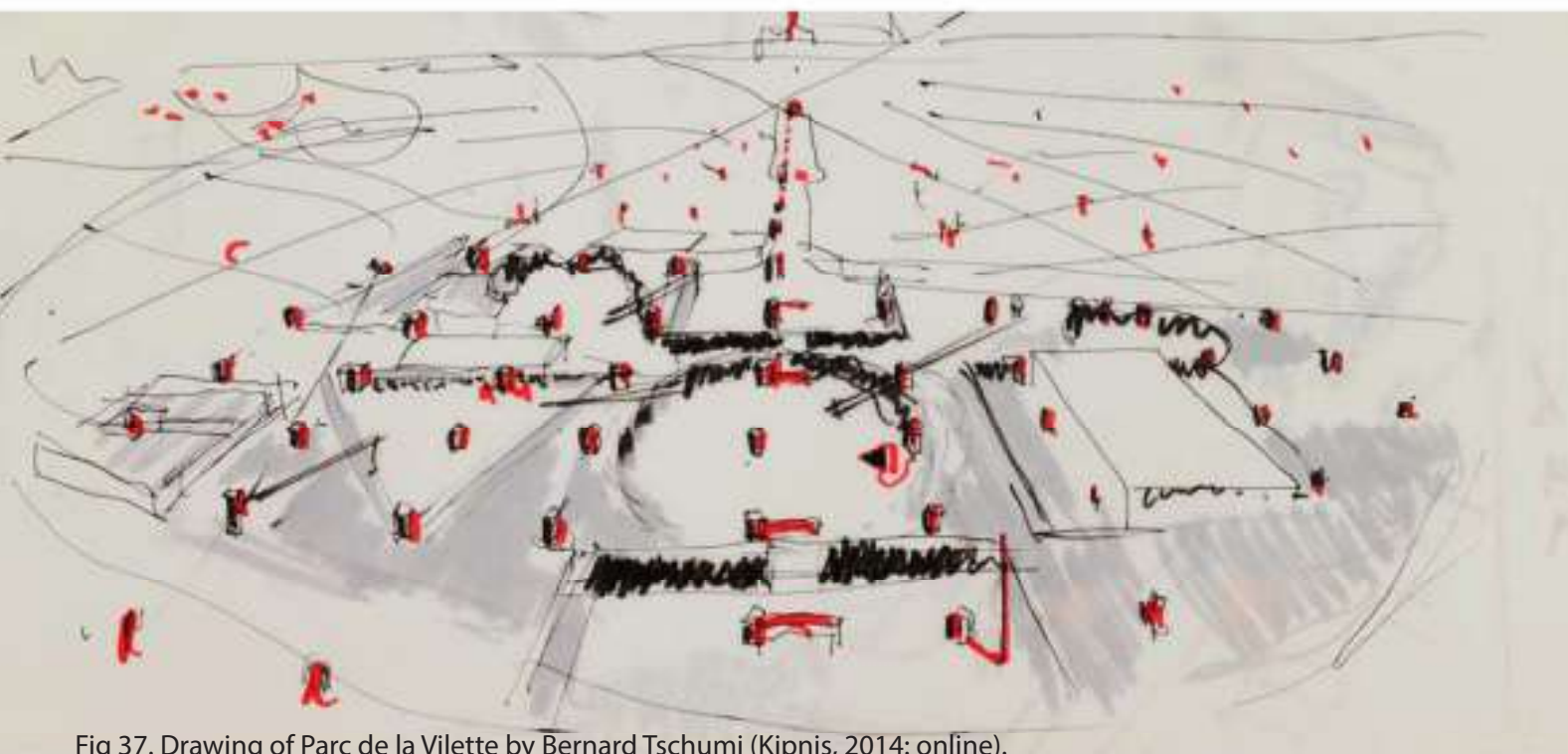


Fig 37. Drawing of Parc de la Vilette by Bernard Tschumi (Kipnis, 2014: online).

6.1.6 NOTATION OF STORIES ON SITE

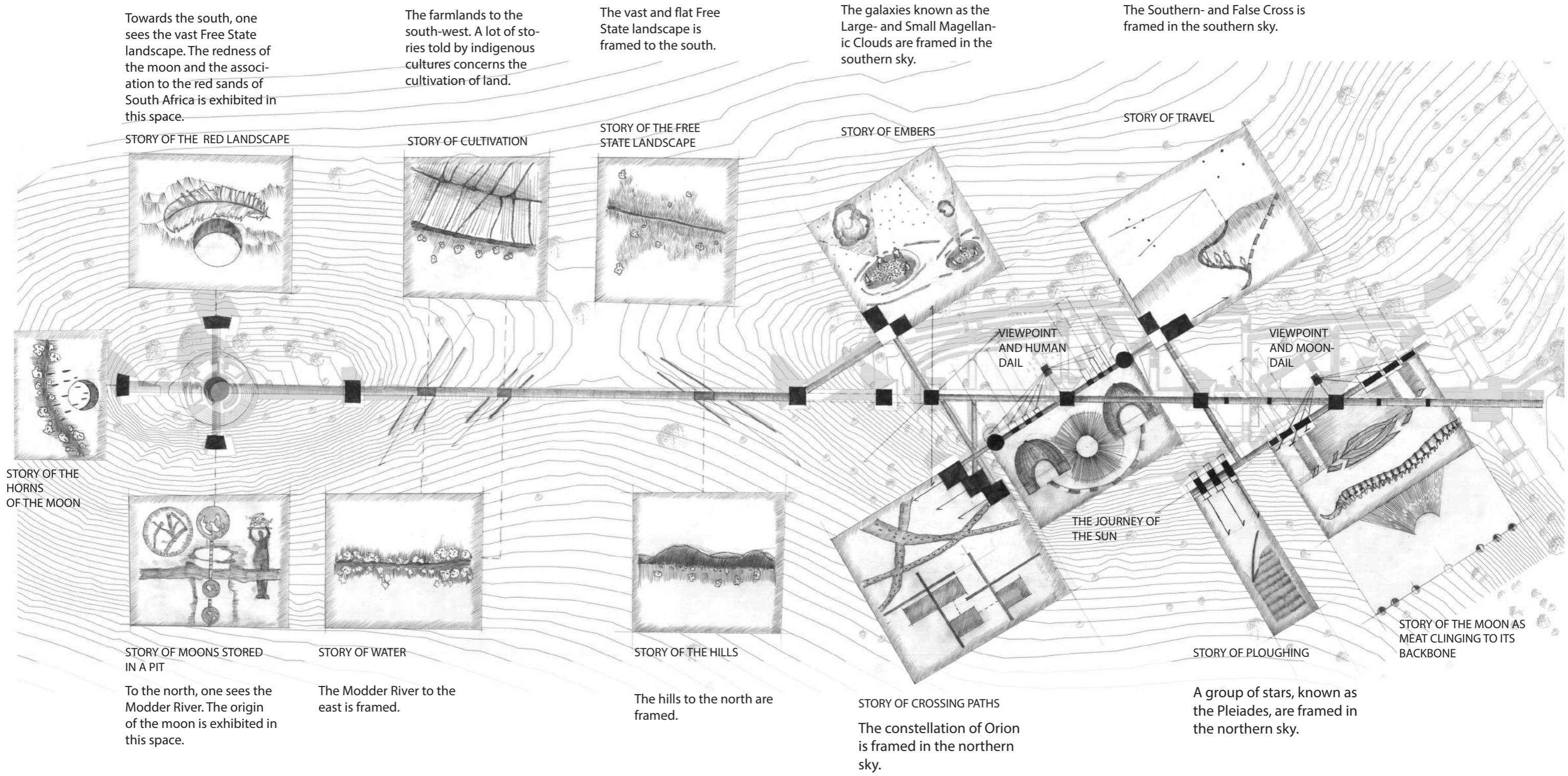
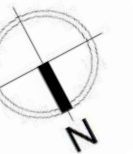


Fig 38. Notation drawing on site



6.1.7 NARRATIVE DESIGN PRECEDENT- FREEDOM PARK JOHANNESBURG

6.1.7.1 NARRATIVE: BOULDERS AND LIGHT SHINING THROUGH CREVICES

The building is shaped like boulders. The openings resemble cracks and crevices and allow light into the tall cave-like volumes inside with limited light; this breaks the surface and illuminate the volumes.

The exhibition spaces within these boulder like volumes were linked with low compressed spaces to spatially capture the notion that a series of historical epochs were distinguished from each other by an equalitive shift. The idea, which was rooted in the African landscape, is sympathetic to indigenous knowledge systems and has a memorable and unique image. The project became known as the boulder scheme.



6.1.7.2 NARRATIVE: WALL LEADING ONE THROUGH STORIES

The concept was based on a long winding wall line that leads one through the different story telling spaces around a courtyard carved into the hill with planted roofs. A feeling of the building being carved into the hill was explored.



6.1.7.3 NARRATIVE: RECONCILIATION

In order to join the Voortrekker Monument to Freedom Park a road was constructed, joining the history and allowing visitors to notice the divisions of the past in a tangible way and to strengthen social solidarity in the present and future. Many voices, communities and identities of South Africans needed to be considered in the project. The Architecture needed to be lasting and accommodate all South Africans.



6.1.7.4 NARRATIVE: EMERGING FROM THE LANDSCAPE

The Skhumbutho served as a counterpoint to the dominating hill-top structures of the Voortrekker Monument and UNISA campus surrounding it, emerging from the landscape as if carved out of it, blurring the land between landscape and architecture. The idea of a spiral path that leads visitors up to the top of the hill created a pilgrimage route up to the names of fallen freedom fighters at the apex (Archdaily, 2012: online).

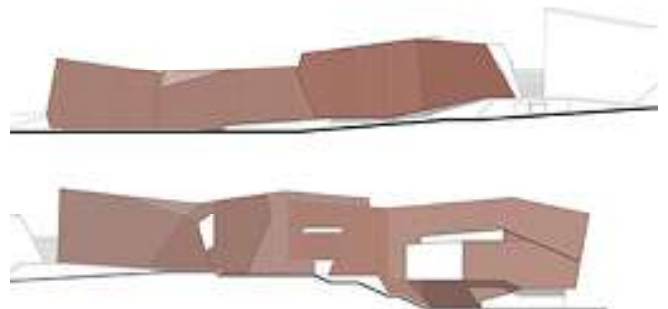


Fig 39. Plans, sections, perspectives and elevations of Freedom Park (Archdaily, 2012: online).

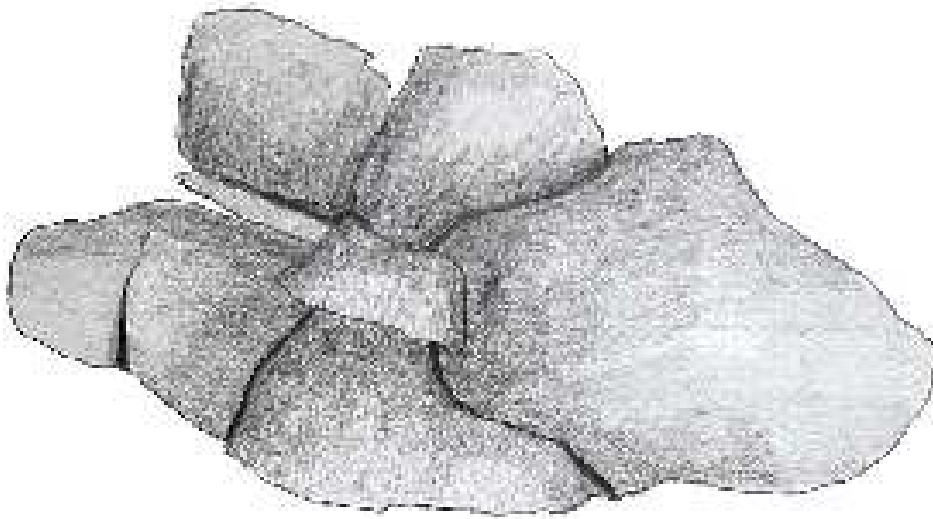


Fig 40. The inspiration for the building's formgiving- boulders with crevices.



Fig 41. Staircase in Freedom Park building resembling a crevice in a boulder where light falls through.

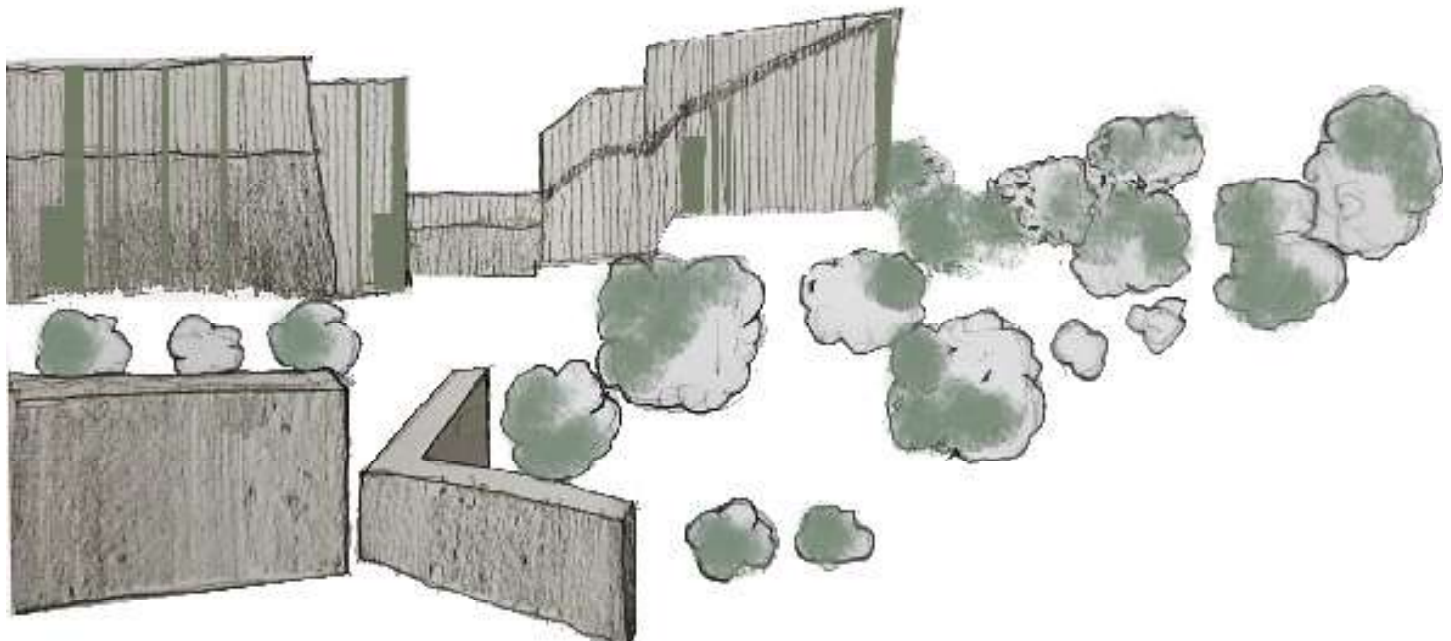


Fig 42. Freedom Park in the landscape. Copper walls turn green as the copper ages which makes the building blend into the landscape.

6.1.8 PRECEDENT: SAINT PIERRE - LE CORBUSIER

6.1.8.1 HISTORY OF CONSTRUCTION

Saint Pierre is a church designed by Le Corbusier. The construction of the church started in 1970 and the building was only finished in 2006 due to local political conflicts that stalled construction from 1975 to 2003. The building was completed 40 years after the death of Le Corbusier.

6.1.8.2 DESIGN STRATEGY

The shell of the church is constructed from self compacting concrete. The eastern side of the nave with the small holes in the concrete represents the constellation of Orion. A lot of elements Le Corbusier used in his previous works were again used for the design of this church. The coloured concrete openings is an example of this; It can be seen in the Convent of La Tourette, another of Le Corbusier's designs.

Le Corbusier's aim with the design was to enrich people's experience of spiritual ideas on a modest scale. Le Corbusier mentioned that the space has to be vast in order for the heart to feel at ease but also high that prayers may breathe in it.

Light floods into the interior from the light boxes placed strategically in order to light up the altar during religious holidays such as Good Friday and Easter Sunday. The spirituality of the geometry is used to create the architecture. The base of the church is laid out in a square which morphs to a circle when the top of the volume is reached.

Due to the curvature of the skylight, it causes string-like light patterns to appear on the walls. These light patterns move across the auditorium as the day progresses, due to the moving angle of the sun throughout the day.

Le Corbusier uses the subtle effect of indirect lighting from the side of the building, that illuminates parts of a painted concrete strip. He also uses direct sunlight from the skylights. The use of direct and indirect sunlight create variety of light quality within the building (Archdaily, 2011: online).

Colours that are naturally harmonious are painted on the concrete and highlighted when light falls on it. Le Corbusier once stated, "Colour in architecture; a means as powerful as the ground plan and section, or better: polychromy, a component of the ground plan and the section itself (Les Couleurs, 2020: online).



Fig 43. Saint Pierre church (Archdaily, 2011: online).



Fig 44. Interior of the church. Light from small openings in the concrete wall falling on the walls (Archdaily, 2011: online).

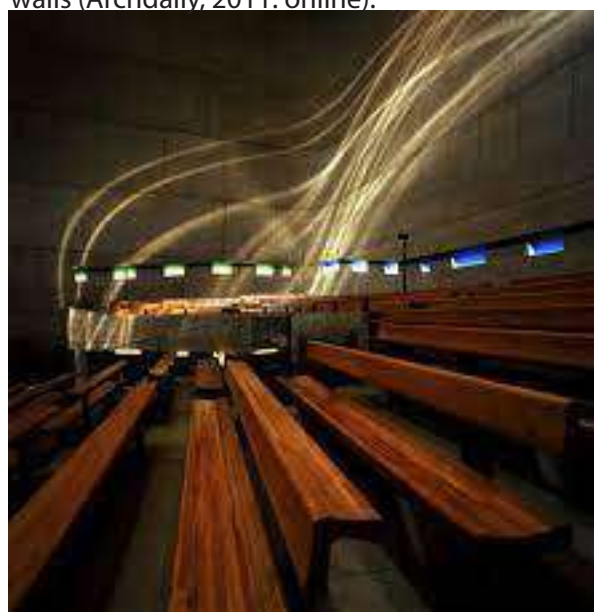


Fig 45. Interior of the church. String-like patterns of light appearing on the walls of the interior (Archdaily, 2011: online).



Fig 46. Skylight (Archdaily, 2011: online).

6.1.8.3 INTERPRETATION DRAWINGS OF SAINT PIERRE- CHURCH

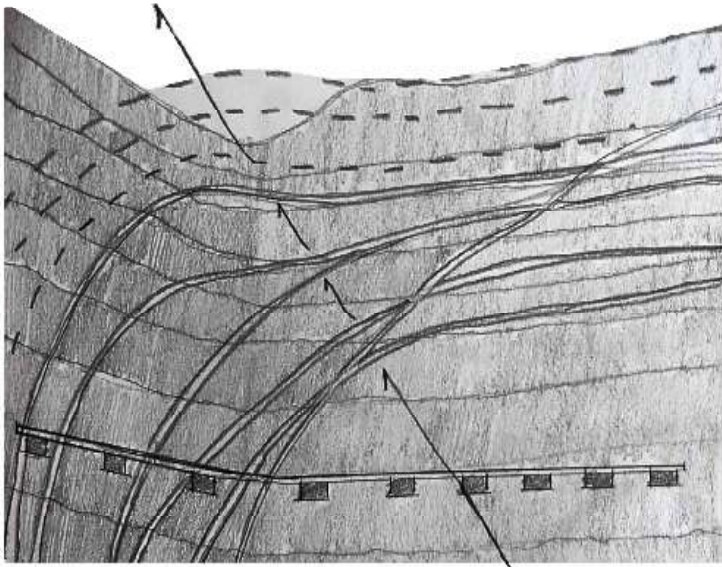


Fig 47. Movement of string- like light patterns in the interior depending on the angle and movement of the sun.

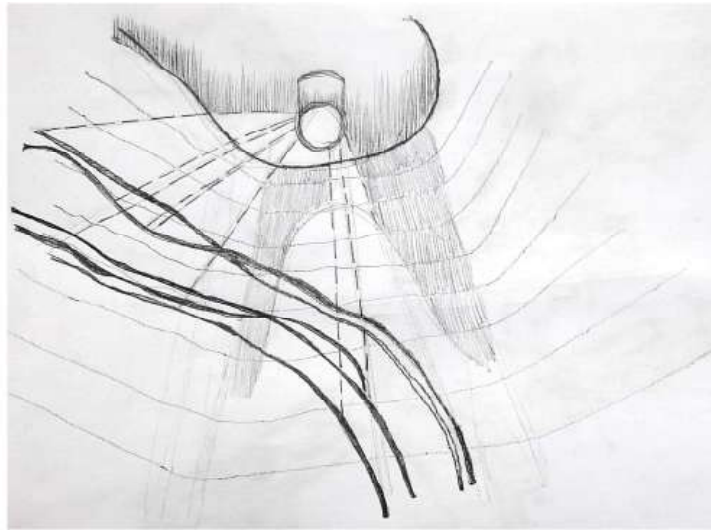


Fig 48. Cylindrical shape of he skylight causing string-like light patterns appearing on the walls of the interior.

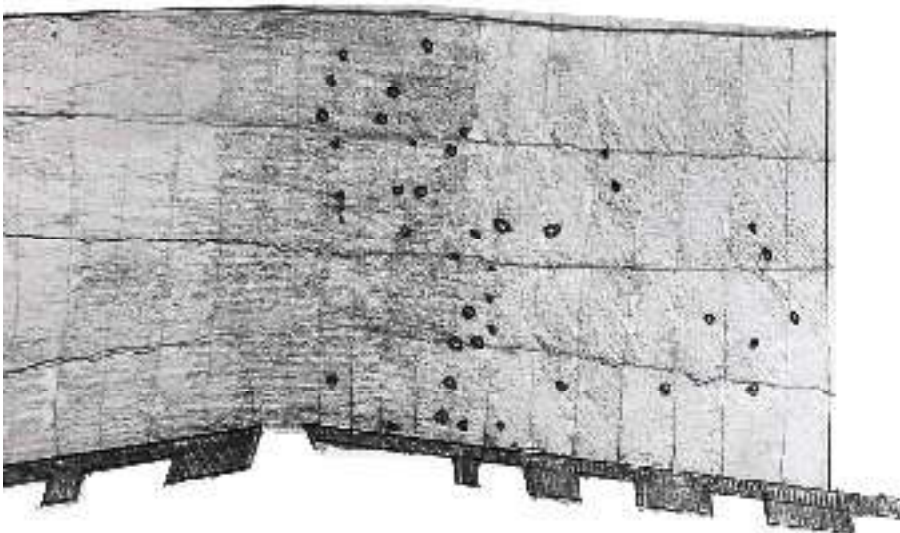


Fig 49. Light shinging through the small holes in the concrete causing light patterns that are arranged according to the arrangement of the stars in the constellation of Orion.

6.2 CONCEPT: FRAMING THE ASTRO LANDSCAPE

6.2.1 Drawing

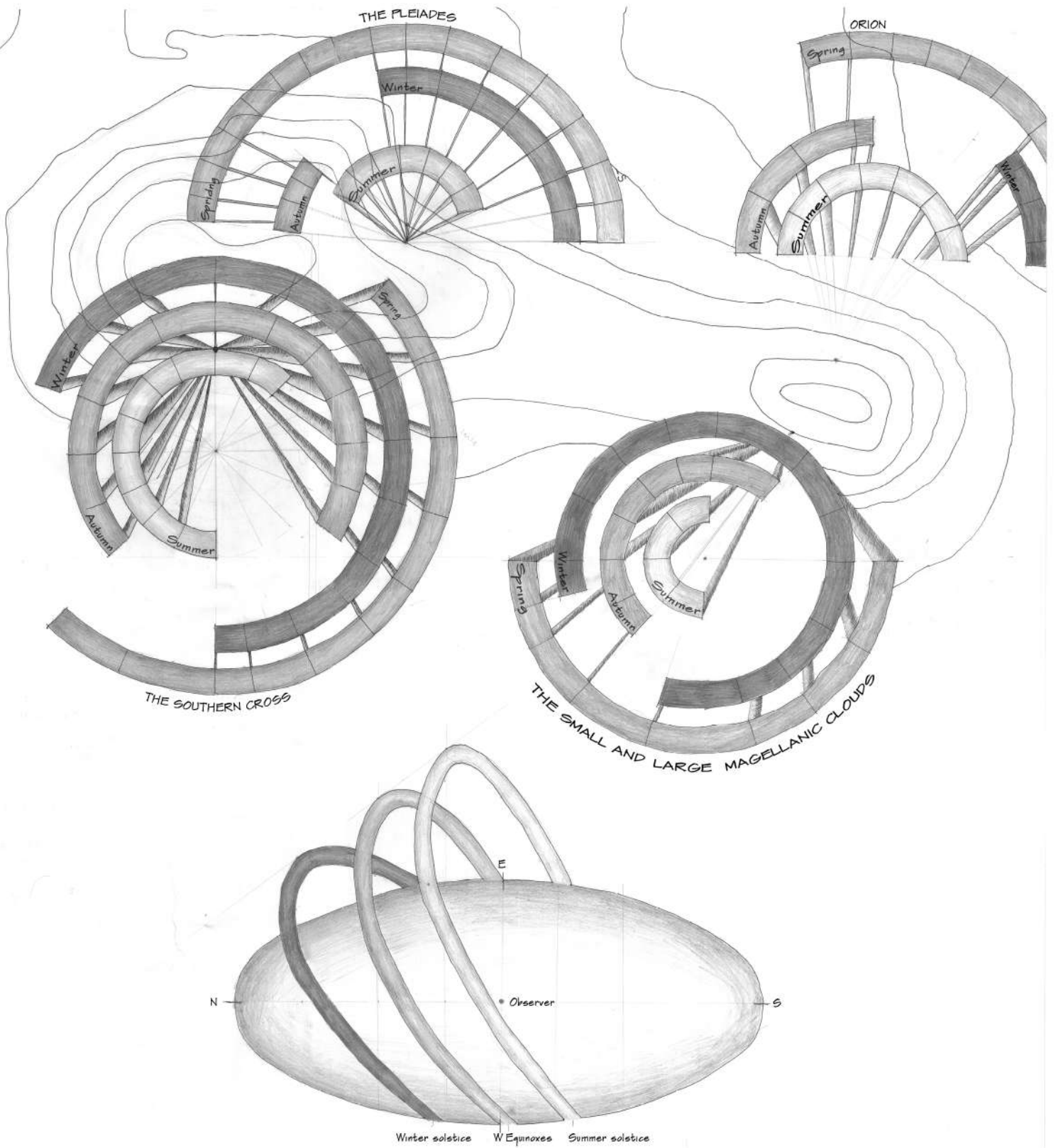


Fig 50. Framing the astro landscape diagram

6.2.2 FRAMING THE ASTRO LANDSCAPE-MODEL INTERPRETATION

The diagram accurately indicates the areas in the sky that these specific constellations are seen during all the seasons. The circular paths are coloured in with different tones to indicate the different seasons. Each of the four circular diagrams represent a different constellation or galaxy.

Certain constellations and galaxies are more discussed among South African indigenous cultures than others. These constellations are Orion, The Southern Cross, the Pleiades and the galaxies are the Small- and the Large Magellanic Clouds.

In the exhibition route, these galaxies and constellations are important points of intensity and are framed from specific points in the exhibition spaces. The Southern Cross and the Small and Large Magellanic Clouds are located in the southern sky, while Orion and the Pleiades are located in the northern sky at night, while the observer is in the southern hemisphere.

During different times of the year these constellations and galaxies are visible in different parts of the sky. The galaxies and constellations follow the same rotational path, but they are visible on different parts of that path depending on the time of the year as indicated on figure 50.



Fig 51. Model indicating the movement and position of the Pleiades, the Southern Cross, the Small and Large Magellanic clouds and Orion in the southern hemisphere, on site.

6.3 CONCEPT: TOUCH POINTS OF SCIENCE AND FEELING

6.3.1 DRAWINGS

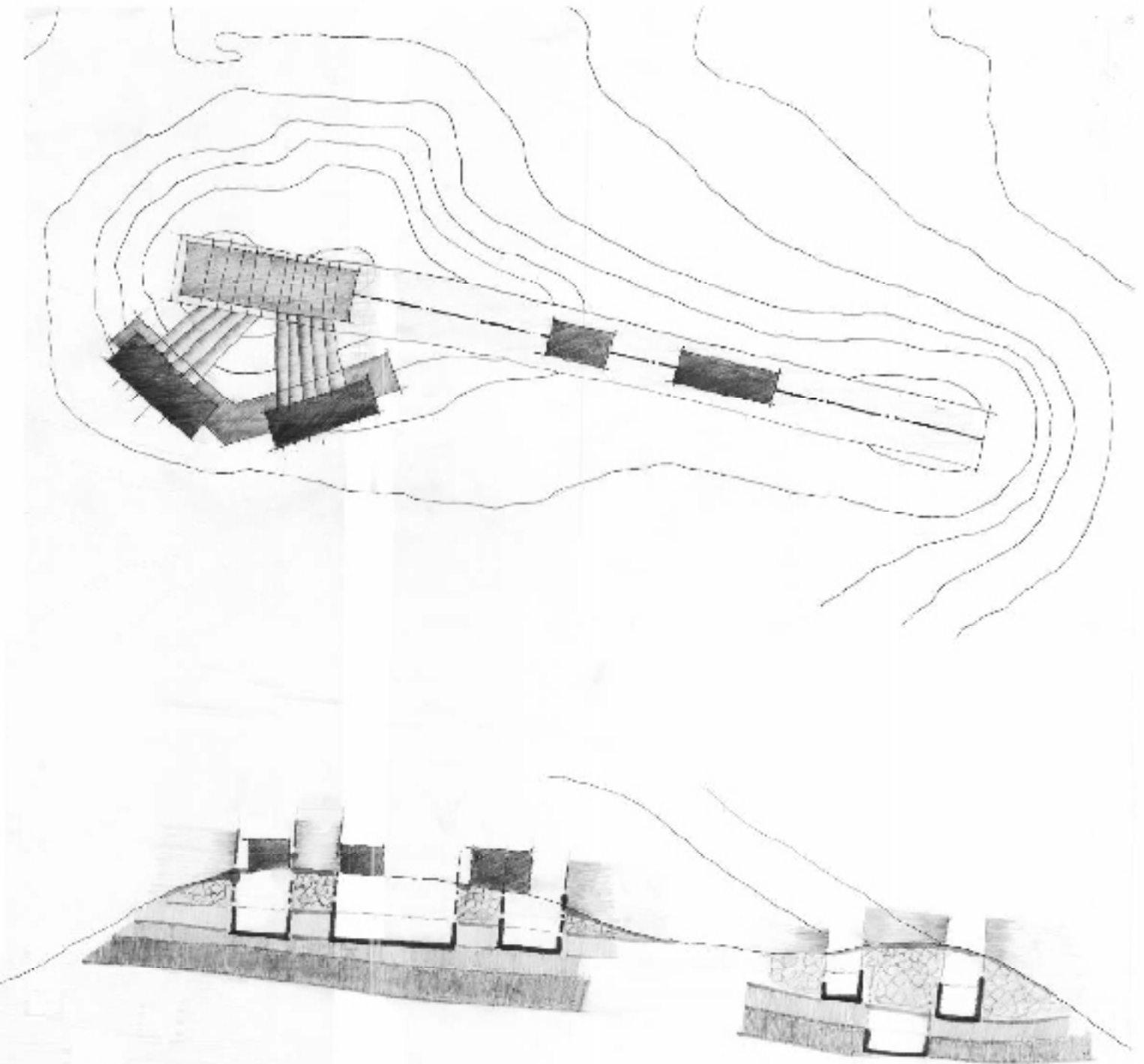
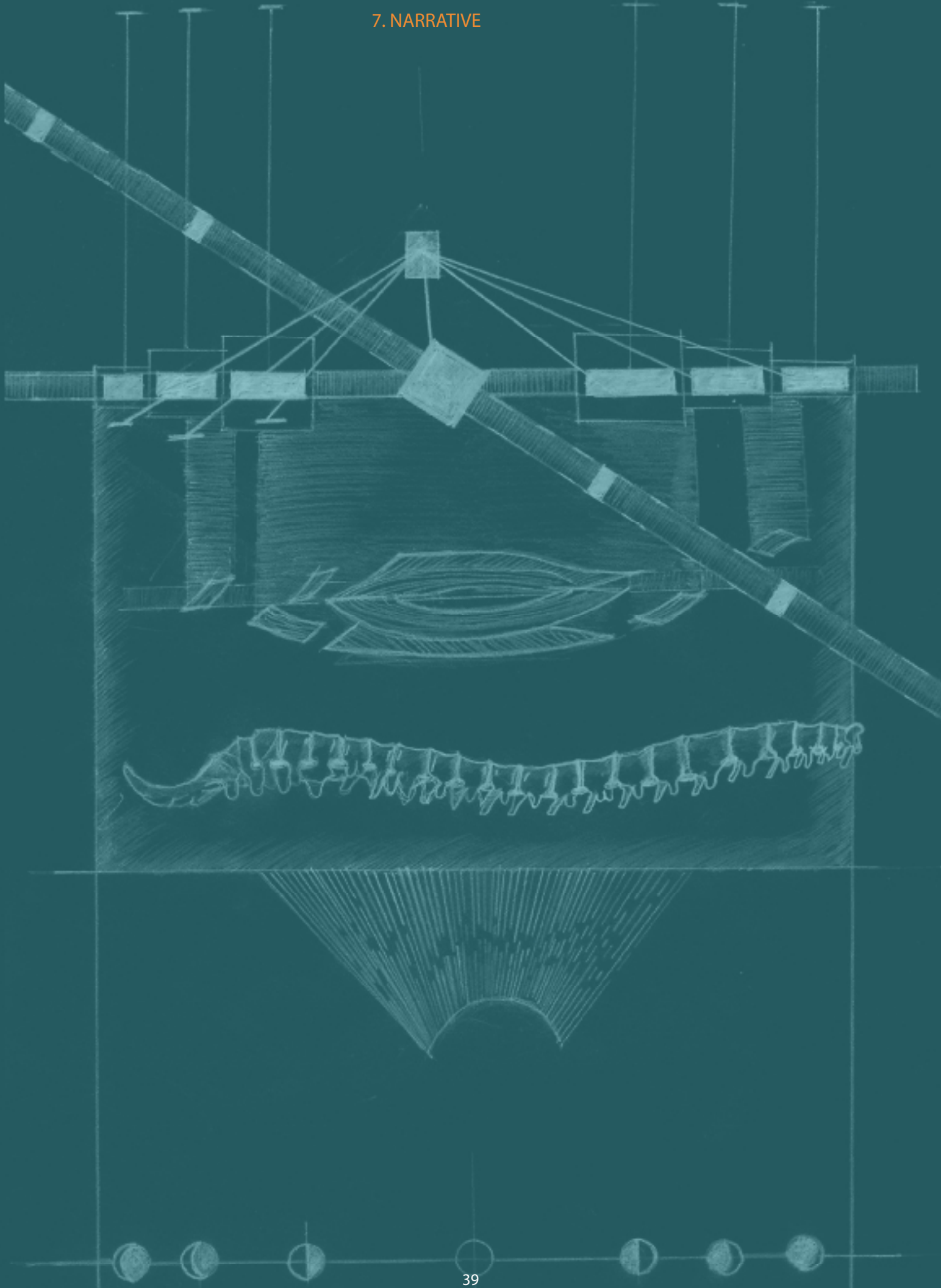


Fig 52. Touch points of science and feeling drawing



Fig 53. Model indicating the juxtaposition of science (the white box on top of the left hill) and feeling (the connection between the two hills).

7. NARRATIVE



7.1 THE SCENE OF NARRATIVE ARCHITECTURE

7.1.1 THE EDUCATION HALL AT BOYDEN

The theoretical discussion began with observing the existing education hall at the Boyden Observatory. This education hall serves its purpose of giving the public much needed factual and scientific education of the universe, the history of Boyden and the development of telescopes. This serves a clear purpose. However, the architecture of this education hall does not adequately evoke sensual experience from the viewer but merely exhibits history in a linear fashion. This kind of architecture is certainly necessary, but the question is whether an exhibition type architecture can evoke more sensual experience from the visitor.

7.1.2 NARRATIVE DESIGN SCENE

During the 21st century, the architecture of exhibition spaces have changed and has been reinvented drastically. This gave rise to architecture that is communicative and sophisticated, architecture dedicated to evoke emotional experience. Most of these contemporary exhibitions aimed to create narrative environments, experiences that integrate objects and spaces. Stories of people and places are also integrated in these experiences as part of the process of storytelling in architecture. The process of storytelling speaks of our sense of self and the experience of the everyday (Furse-Robberts, 2012: 20).

7.1.3 LANDSCAPE AS NARRATIVE

Landscape and narrative are already intertwined due to our constant presence within the landscape and also our predisposition to finding meaning in things.

The intertwining of landscape and narrative can be thought of as occurring in two ways:

- The narrative can be overlaid onto a landscape or derived from the landscape
- The landscape is manipulated in order to represent a certain narrative

It is important to consider that people may have differing narratives for each landscape, and this is influenced by the prior experiences of these people. Storytelling is an important way of sharing knowledge within communities. It is quite possible that our attraction with stories may have started with the development of language and our need to understand and share information regarding our surroundings (Furse-Robberts, 2012: 184).

An example of communities sharing knowledge through narrative:

7.1.3. BEATING THE BOUNDS

“Beating the bounds” is a tradition of a community that walk around the boundaries of their land on a certain day. They then proceed to beating certain important positions on the site with sticks. This is a tradition that dates back to 1500 years ago in the Anglo Saxon period. This tradition also ensured that the community kept track of the extent of their property during a time when maps were not yet available.

Natural features on the site, such as trees and rivers were used as key points that were beaten with sticks as the community passed them. Later, additions such as ditches and markers were made to the natural landscape to reinforce the boundaries of the site. A shared narrative and memorable experience was created when the community walked around the boundaries of their site and knocked these natural features with sticks, the ritual that became a memorable experience (Furse-Robberts, 2012: 185).

7.1.3.2. DREAMTIME MYTHOLOGY OF THE AUSTRALIAN ABORIGINAL COMMUNITIES

Songs that originated from these communities, had lyrics referring to key points in landscapes that they knew. This created an imaginary map of natural features that are important. In these two examples narrative and landscapes have been combined by these communities because of the important locations within them.

In these examples it can be seen that landscapes can evoke certain responses from the viewer. It is therefore quite possible that the combination of certain landscape elements can create a narrative. The hypothesis is that the arrangement of landscape elements that create appealing narratives would be favoured above arrangement of landscape elements that would create less appealing narratives (Furse-Robberts, 2012: 185).

7.1.4 PRECEDENT OF WHERE A LANDSCAPE FORMS AN APPEALING NARRATIVE: ROUTE OF MAM-TOR

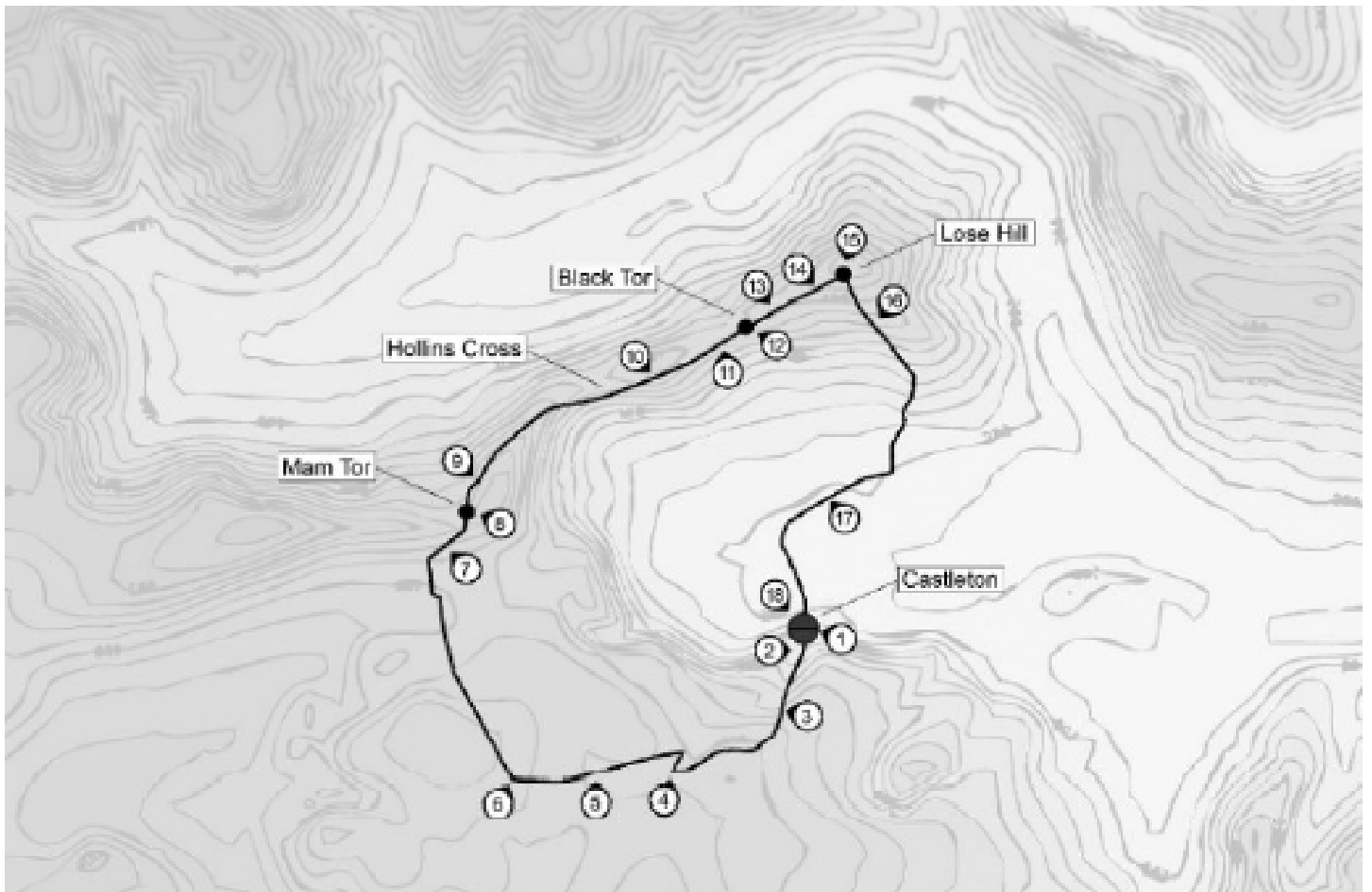


Fig 54. Route of Mam-Tor layout

This is a route that stretches 7 miles. The route starts at a village called Castleton in Derbyshire, England. One makes one's way up a mountain to Mam-Tor. The path then leads to the top of Lose Hill from where one ascends into the valley and back to Castleton. A reason for the appeal of this route could be the embodiment of a good narrative (Furse-Robberts, 2012: 185).

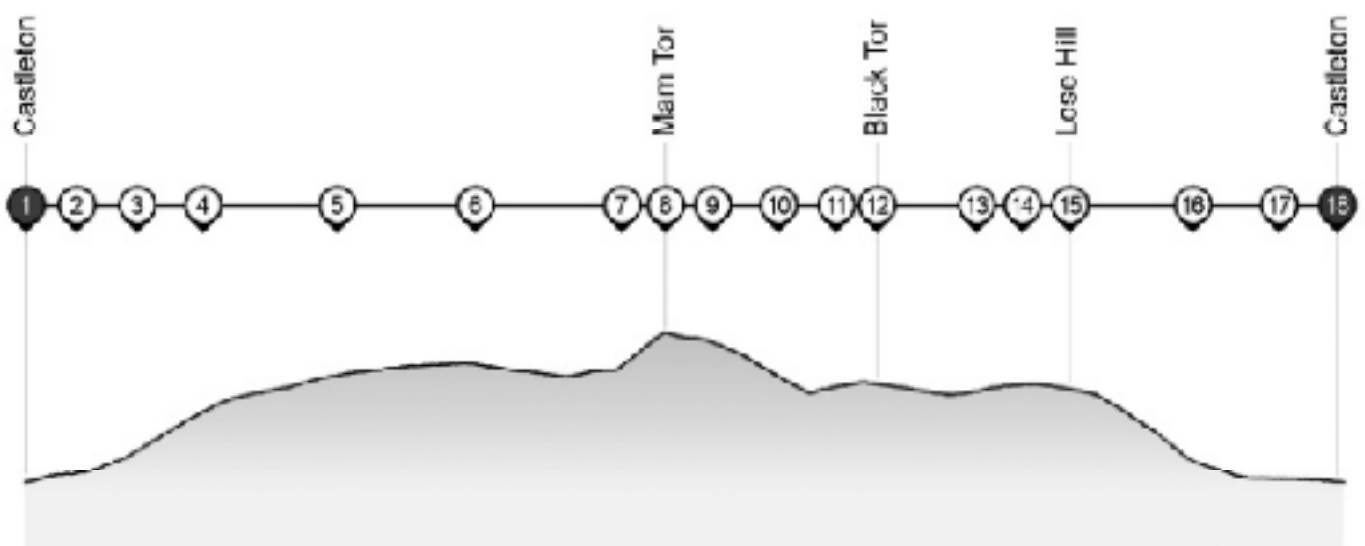


Fig 55. Section of Mam-Tor route

7.1.5 HOW IS NARRATIVE THEORY USED IN THE DESIGN OF THIS ROUTE?

Along this route a lot of elevation changes occur. Different plots are located on different parts of this route. In this design the periods of tension are compared with uphill walking on parts of the route with climaxes located at the top of the hills. The process of conclusion is compared with the downhill paths that leads to the start points of the route.

Factors such as the amount of wilderness, the changes in topography, the type of path, the elevation and amount of enclosure contributes to the path having an underlying emotional narrative that makes the route enjoyable for visitors. Because these are base emotional responses, it is accessible to all hikers that travel this path. But with these base emotional responses there are also cultural narratives associated with these spaces. An example of this is where a path crosses a ridge between Mam-Tor and Black-Tor which is called Hollins Cross. The locals will more than likely know that its name comes from the cross that once stood there and that the pathway is known as coffin road as this path was used to get from Edale to the Church of Hope on the other side.

The natural responses of this route was not designed but is a result of the natural landscape management practises. The sequence has however been selected by designers and enhanced by the addition of pathways. Although it is possible to create these elements where they have not existed before. A common example of the latter is the creation of gardens. The word garden refers to a space that is enclosed. It is suggested that gardens are part of the landscape that have been isolated and sculpted by humans (Furse-Robberts, 2012: 186).

7.1.6 PLOT SUMMARY OF THE ROUTE OF MAM-TOR

1. Start: This is the start of the journey from Castleton.
2. Movement: One moves from an urban to a natural environment. Base emotional narrative : moving away from safety. The houses that were to the side of the road is now replaced with limestone cliffs located next to a ravine.
3. Movement: The journey continues. Base emotional narrative: Confinement. This is experienced due to movement on a steep sided ravine.
4. Movement: The ravine narrows until one reaches a flat and open top of a hill. Base emotional narrative: Moving from nature into the wilderness.
5. Movement: There is openness with no clear path. Base emotional narrative: The feeling of being lost.
6. Movement: One is directed to a 90 degree turn where one can see Mam-Tor. Base emotional narrative: One now has direction and a new sense of purpose. This is in contrast with the previous emotional narrative of being lost.
7. Movement: There is an increased effort to reach the top of the hill. Base emotional narrative: effort
8. Pause: Reached the destination of Mam-Tor. Base emotional narrative: reward for previous effort
9. Movement: The other hills are laid out in front of the viewer.
10. Movement: Visually, Black-Tor looks steep.
11. Movement: The climb up Mount-Tor is steep. Base emotional narrative: effort.
12. Pause: One arrives on top of Mount-Tor. One experiences the views on site. Base emotional narrative: reward- One is rewarded with the views of the site.
13. Movement: One focuses on the next goal, which is to arrive on the next hill.

14. Movement: The start of a slow ascension up Lose-Hill.

15. Pause: One reaches Lose Hill. One is rewarded with 360 views on top of the hill.

16. Movement: This is the start of the final hill descent to Castleton. Base emotional narrative: Moving from wilderness back to the civilization as one moves from an open moor to enclosed fields.

17. Movement: One experiences views of the ridge. Base emotional narrative: Feeling of accomplishment.

18. Finish: One arrives at Castleton. One returns to the start and the circle is completed. One return to civilization. Base emotional narrative: One experiences the sense of achievement (Furse-Robberts, 2012: 186).

7.1.7 DRAWINGS OF THE MOUNT MAM-TOR EXPERIENCE- JAMES FURSE ROBERTS

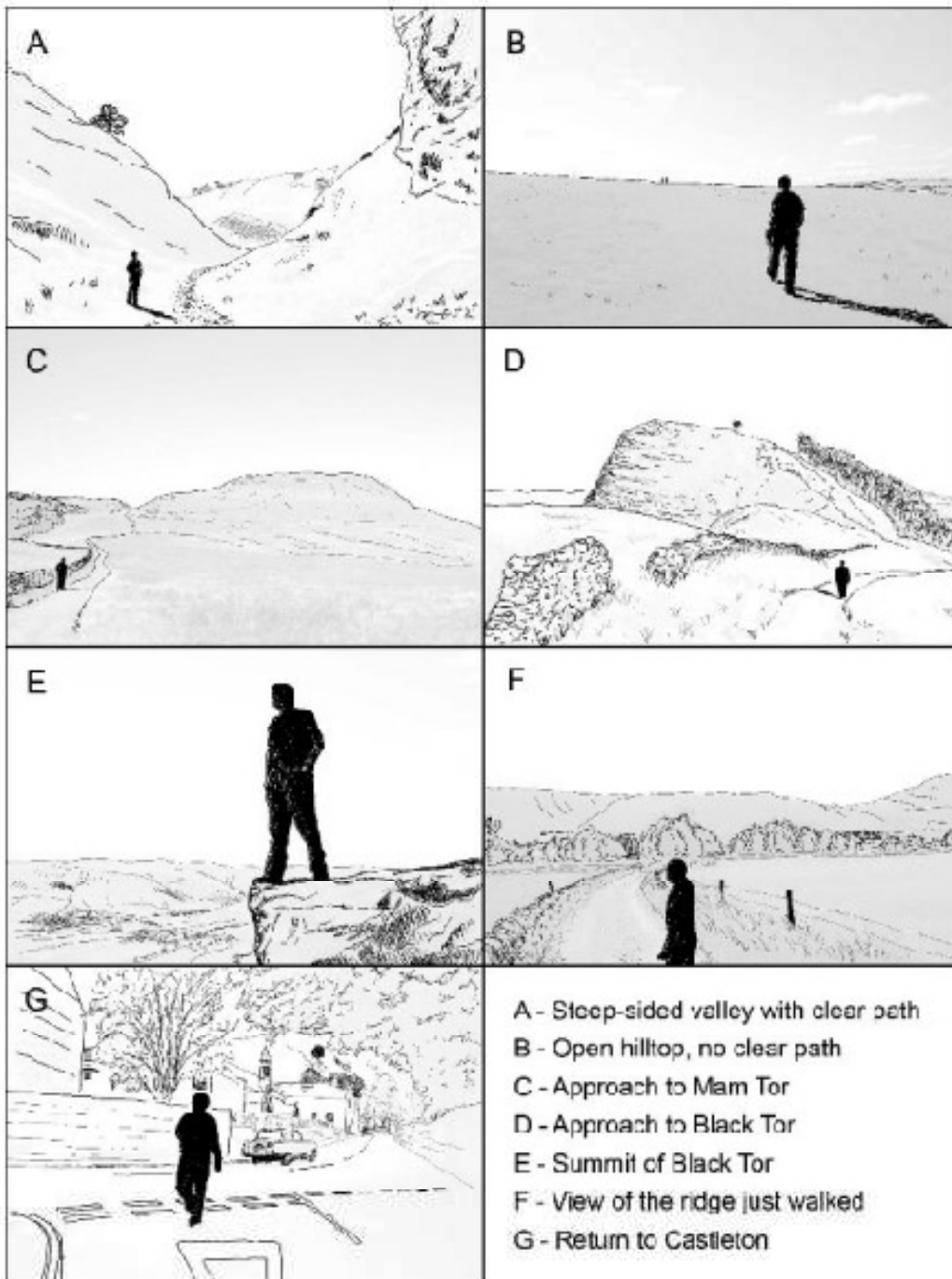


Fig 56. An illustration of perspectives at seven points on the Mam-Tor route, Peak District, England.

James Furse-Roberts analyzes how the landscape itself can be a source of narrative. He also explains how a landscape can be deliberately designed in order to convey a narrative. He goes on to describe how basic structures of narrative can be used to understand emotional and intellectual responses to the landscape (Macleod, Hourston & Hale, 2012: 106).

7.1.8 PRECEDENT- KAIYU-SHIKI "STROLLING GARDENS"

The application of landscape narrative based design can be seen in the Kaiyu-Shiki gardens, also known as the "strolling gardens", designed by the Japanese. These designers laid out the garden paths in a very specific way in order to control the pace of the walker and the views to which the walker is directed. Stepping stones were introduced in the paths to slow down the walker and to direct attention to the walkers feet (Furse-Roberts, 2012: 189).



Fig 57. Daisen Japanese garden (Shizenstyle, 2019: online).



Fig 58: Perspective drawing of design

7.2 INDIGENOUS CULTURE STORIES

When one investigates indigenous cosmology, one finds that there are a lot of stories and myths relating to galaxies and constellations, as seen from the Southern Hemisphere. The most prominent galaxies are the Small and Large Magellanic Clouds; and the constellations being Orion, the Pleiades and the Southern Cross. To see the Milky Way as a path is also a prominent theme in many stories. Other stars that are discussed are Sirius and Canopus. The relationship between the Sun and the Moon is prominent in stories told by indigenous cultures.

7.2.1 PLEIADES STORIES

The Pleiades play a very important role in South African astronomical beliefs. It is also known as the Seven Sisters. The Pleiades form part of the constellation Taurus, and the name originates from Greek mythology. The name refers to the seven daughters of Atlas. The Pleiades is an open stars cluster that consist of an estimated 200 to 500 stars. In indigenous cosmology, the Pleiades are associated with a strong narrative of ploughing, and the marker of a new year or season (Alcock, 2014: 231).

During the Lunar months of June and July the Pleiades rise in the early morning. This Phenomenon was of great importance to the Zulu as this event signalled the start of a new year, or new season. It also signals the start of the cultivating season, when the time to start digging or hoeing the ground has begun. When the Pleiades appeared in the early morning; it signalled the start of spring.

The Zulu state that the Pleiades fetched the diggers when the Pleiades can be seen rising in the morning.

In historical times, digging sticks were used to plant crops in South Africa. Evidence of iron smelting was found in Kwazulu Natal as well as the Transkei, and can be tracked back to the Iron Age. The Zulu digging stick was composed of a wooden handle with an iron blade. The Zulu women were in charge of the crop cultivation, while the men were responsible for ploughing the ground with animal drawn ploughs, which was a big innovation at the time, instigated by missionaries (Feely, 1985: 10-11).

The Xhosa called the Pleiades *isiLimela*. This directly translated means, "the one that ploughs", meaning, the ushering in of the ploughing season.

When the Xhosa sighted the Pleiades in the early morning, it signalled the start of the new year. The traditional Xhosa year began in June. For the Xhosa, these stars signalled the time to start hoeing the ground, and it signified the start of Spring. The Xhosa utilized wooden digging sticks to plough. Initiation ceremonies were held when the Pleiades were seen early in the morning. The initiates awaiting circumcision had their "coming out" ceremonies. In order for them to be seen as mature, they had to go through the ceremony (Kopke, 1982: 229-238).

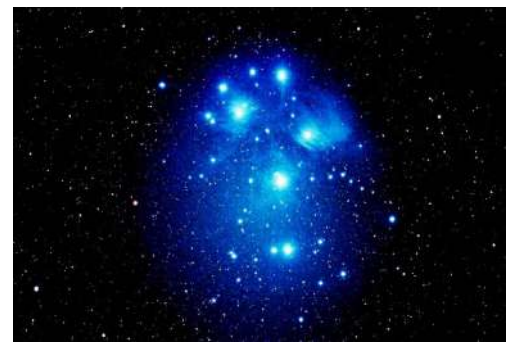


Fig 59. The Pleiades open star cluster, also known as the seven sisters (Celestial image CO, 2021: online).



Fig 60. Zulu story of Pleiades fetching the diggers.

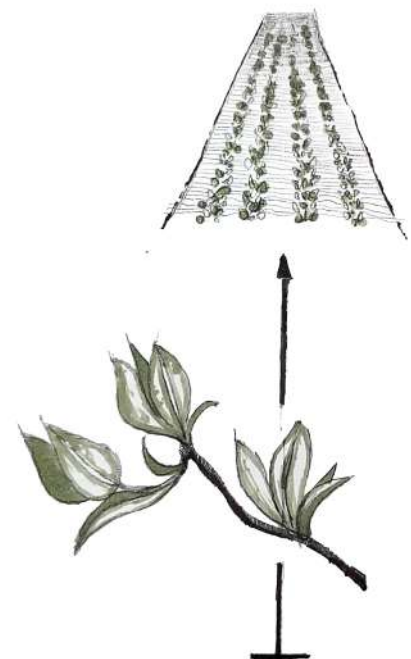


Fig 61. Zulu story of the start of spring, the new year and the time to start ploughing.

The Northern Sotho called the Pleiades *Selemo*, which means “summer”, or the cultivation season. For the Northern Sotho, the Pleiades when seen overhead at sunrise meant that the dry lands needed to be cultivated. Around the middle of August, the highest elevation is reached by the Pleiades during the early hours of the morning. There are two methods in which the Northern Sotho planted crops. One method was awaiting the rain during spring to dissipate the seeds onto the soil, and then start to hoe. The other method was to first dig the hole, then plant the seed when rain is expected. The latter was mostly used for planting pumpkin and mealies, but not for sowing corn (Alcock, 2014: 244, 245).



Fig 62. Northern Sotho story of Pleiades seen directly overhead during sunrise: Time to dig the dry grounds.

The Southern Sotho, or Basotho, called the Pleiades *Selemela* which means the cultivator. This name was given to the Pleiades because of the fact that the Pleiades rise in the Spring on the North-Eastern horizon during the same time cultivation of the lands start. Some of the Sotho insisted that they should finish up with the harvest before the Pleiades disappeared from the sky in the winter months; this is because they held a belief that the grain collected after that date would evaporate (Ashton, 1952: 355).

The Tswana called the Pleiades *Selemela*. *Lema* means to plough or to cultivate. It denoted the ploughing season when it was seen high in the sky (Cole-Beuchat, 1957: 133-149).

The Tsonga referred to the Pleiades as *Shirimelo* which means, “the one which announces the tilling season”. This signalled the time to cultivate land for the crops (Junod, 1927: 559).

The Venda referred to the Pleiades as *Tshilimela*; this meant the start of a new year and the time to cultivate the ground (Stayt, 1931: 392).

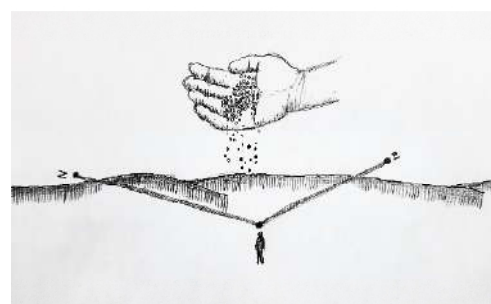


Fig 63. Southern Sotho story of Pleiades rising in the North-Eastern horizon during spring: Time for cultivation to start.

The Khoikhoi referred to the Pleiades as *Gamiroti* or the Hoar Frost Stars, as these stars appeared at nights when it was so cold that hoar frost was found in the mornings. The Khoikhoi held religious dances as the Pleiades rose during the early hours of the morning during winter. When the Pleiades could be sighted, the mothers would elevate their children, and run to higher ground to show the “friendly stars” to their children. The mothers encouraged the children to reach to the sky with their hands towards the Pleiades. The Pleiades were known as the Rain Stars to the Khoikhoi, and it signalled the start of the new year (Schapera, 1965: 450).

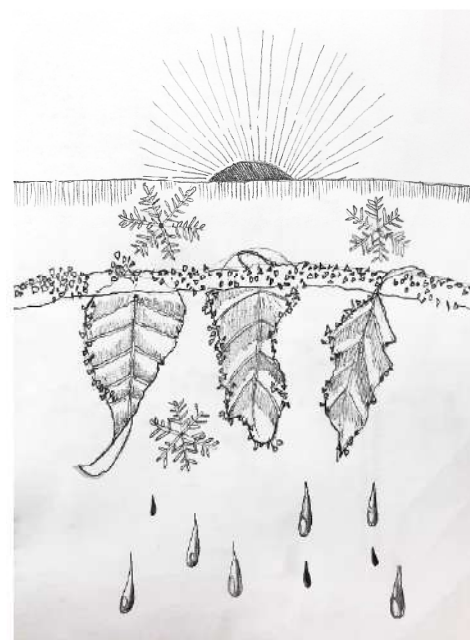


Fig 64. Khoi-Khoi story of Pleiades appearing in the night: Hoar frost could be expected in the morning and rain in the future.

7.2.1.1 SPATIAL INTERPRETATION OF THE PLEIADES STORIES

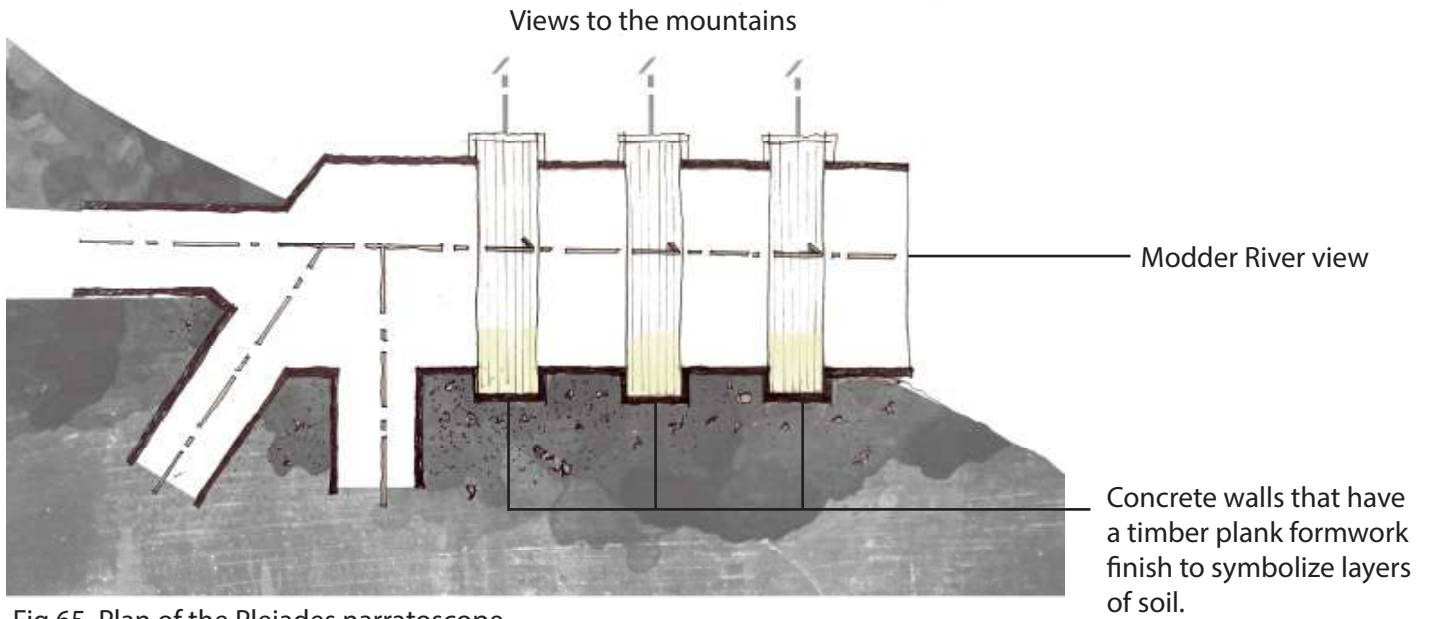


Fig 65. Plan of the Pleiades narratoscope

The Pleiades exhibition conveys the narrative of digging into the landscape. To get to each of the three exhibition volumes, the observer has to go down the stairs. The stairs symbolize the effort of digging into the landscape but also the elevation difference one experiences when digging into the ground. The stairs are placed parallel to concrete walls that have a pattern left from timber plank formwork used to cast the concrete in, that strengthen the narrative of digging into the earth. At the end of this route, the exhibition is orientated towards the Modder River, as the Pleiades were known to the Khoikhoi as the Rain Stars, hence the connection between the exhibition and the Modder River which is filled by the rain. Above the concrete walls with the patterns left by the timber formwork, light shafts are located to light up these sections of the volume to emphasize these feature walls.

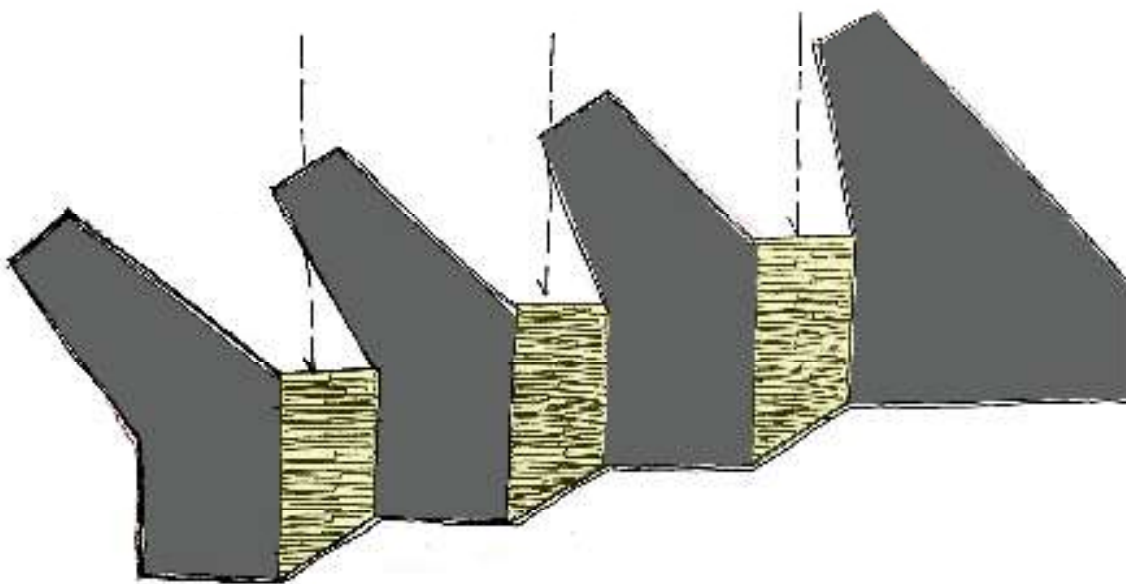


Fig 66. Section of the Pleiades exhibition.

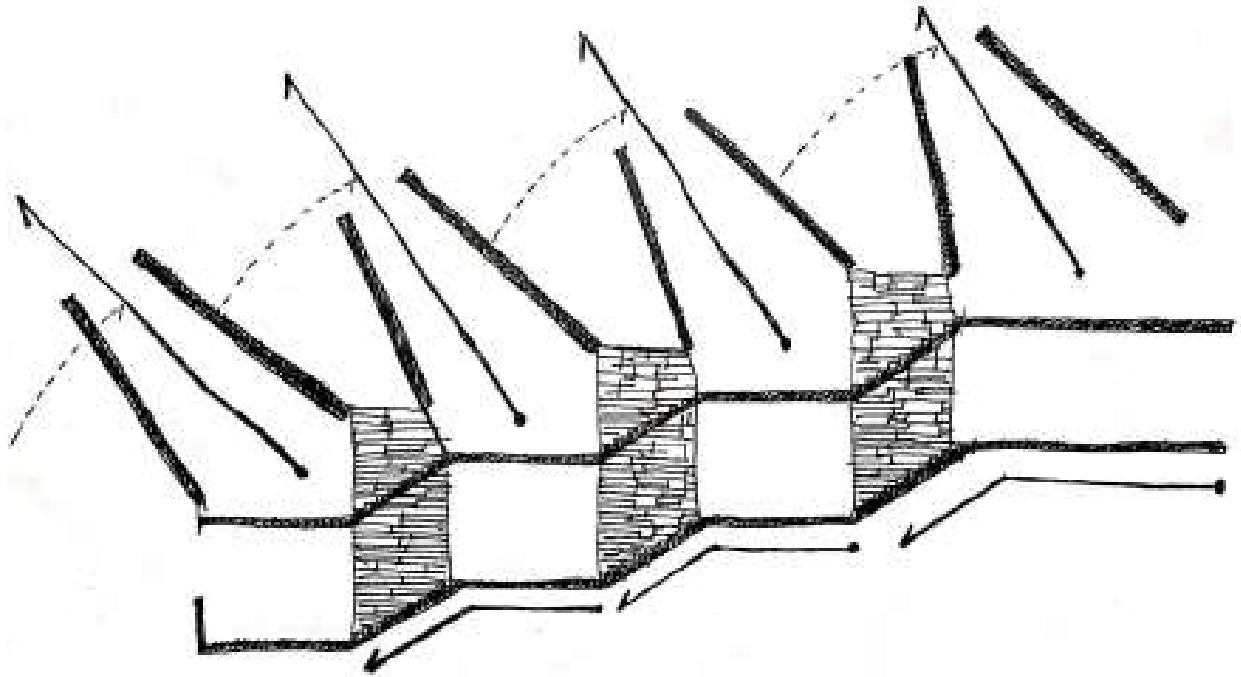


Fig 67. Diagram 3 of the Pleiades narratoscope- spatial interpretation of two floors.

The top floor of the Pleiades exhibition consists of a roof divided into four parts. Each part is directed toward the position the Pleiades will first be seen in the morning. The meaning of the positioning of the Pleiades when first seen in the morning is exhibited on the walls of these volumes. The practical use of observing the Pleiades at different heights is exhibited in these volumes. The bottom floor of the Pleiades exhibition is where the narrative of "digging into the landscape" is exhibited. The tools used to plough the ground, and the general methods of ploughing is showcased in these volumes.

The Pleiades exhibition is located to the north of the site, as the Pleiades only appear in the northern sky in the southern hemisphere.

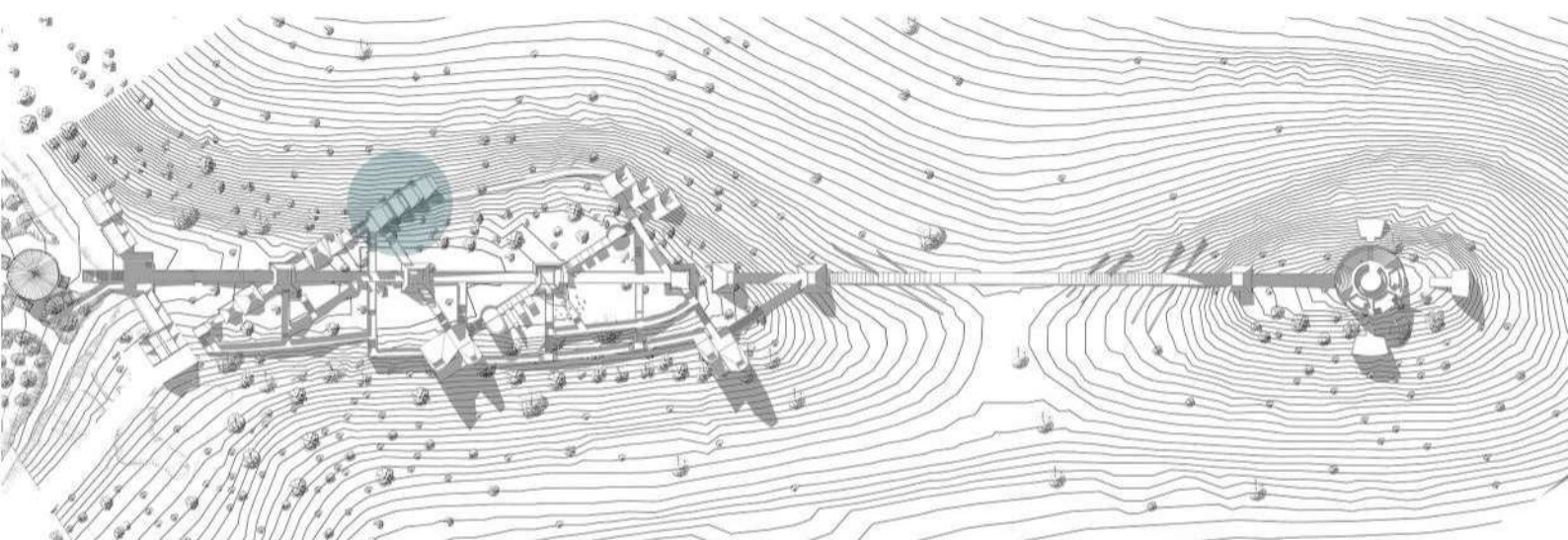


Fig 68. Key indicating the location of the Pleiades narratoscope.

7.2.2 THE MILKY WAY STORIES

For the Zulu, the milky way resembled the inside of a cows gut ,or a strip of muscle encircling the cattle paunch. Some Zulu were able to establish the time of sunrise by looking at the orientation of the milky way.

When the milky way had an east-west orientation, the Zulu believed that rain could be expected. This is an accurate observation, as the milky way is orientated in this manner ,during the summer months, when rain is expected. This is due to the fact that it was a summer rainfall region they were living in. If the milky way had a north-south orientation, no rain was expected. This happened during the winter months (Faye, 1923: 122).

The Northern Sotho used the term *molalatladi* to describe the milky way. *Molalatladi* is translated as the resting place of the lightning bird. The Northern Sotho believed that the first children walked the road, the milky way, towards the location where the sun rises. Another name for the milky way was "*tsela ya badimo*" which means : the path of the ancestral spirits (Watson, 1983: 241).

A POEM BY KABBO: THE MILKY WAY AND THE STARS

The wood ashes that lie here must become the milky way
they must lie along the sky
that there are stars that stand outside of the milky way
while the milky way remains the milky way
The milky way must go round with the stars
while the stars sail along
they sail along on their footprints
which they, sailing along, are following
the sky lies still

The stars have turned around
the stars are those which go along
while they feel that they sail along on their footprints
The stars become white when the sun comes out
the stars wax red when the darknes comes out.
people go by night when the ground is made light
when the milky way gently glows
The milky way must white lie along the sky
while it feels that it is wood ashes
the earth would not have been so light
had not the milky way been the milky way,it and the stars
(Krog, 2004: 64).



Fig 69. The milky way (Moskwitch, 2010: online).

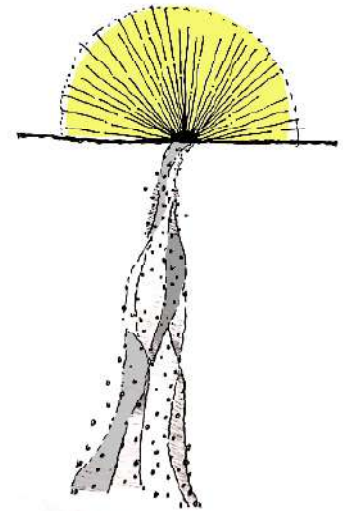


Fig 70. Interpretation of the Northern Sotho story of the milky way as a path to the rising sun.



Fig 71. Interpretation of the "The milky way and the stars."

It was believed that a girl who was part of the early race wanted to have light so that her people, the hunters, could travel by night in order to return home in the dark. The girl then threw some ashes into the air, which formed the Milky way. The Milky Way formed as a road consisting of ashes. The creation of the Milky Way was the presupposition for the formation of the other stars. The girl chose the roots that were scented and threw it into the sky. The red and old roots formed the red stars while the white, young roots formed the white stars (Shapera, 1965: 450).



Fig 72. Red, white and blue stars (Kramer, 2013: online).

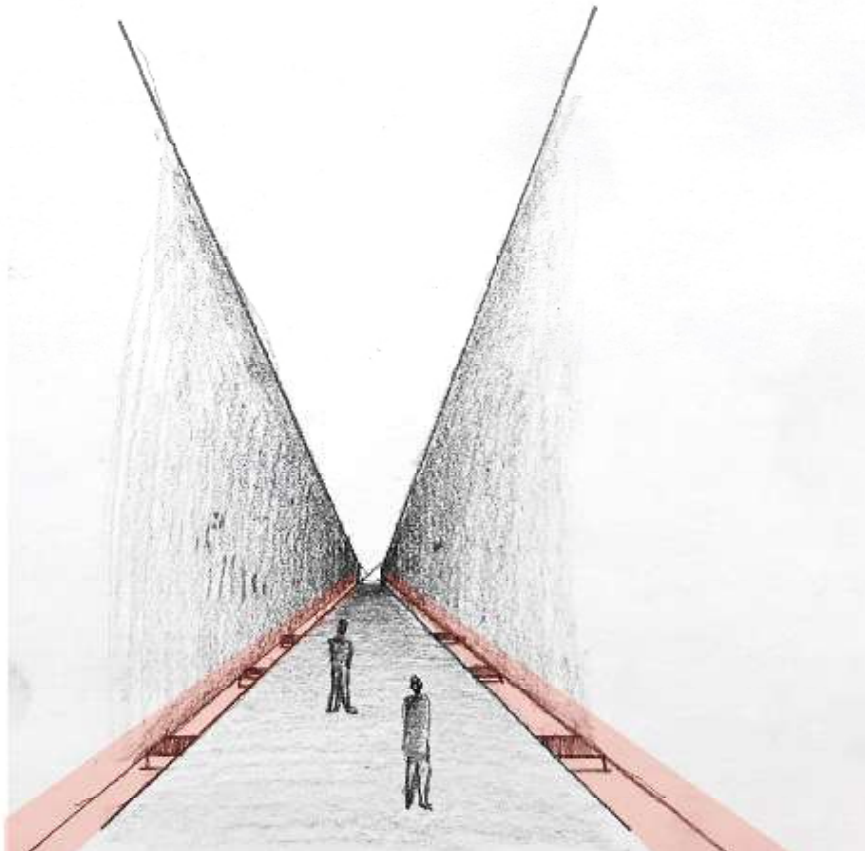


Fig 73. Interpretation of the milky way as a path made of old red roots.

7.2.2.1 SPATIAL INTERPRETATION OF THE MILKY WAY STORIES

This interpretation drawing represents the milky way. The milky way is spatially interpreted as a path. The path draws the attention of the visitors to the cosmos.

Subtle red light is used to represent the “old red roots” that were thrown into the sky by girl of the early race, as mentioned in the Xam folklore. This light is only used during nights when the full moon is not sufficient to light up the path.

The path isolates the viewer from the site and therefore isolates the viewer. This reminds the viewer how dependant the indigenous cultures were of the stars and the moon during the night for travelling and hunting purposes.

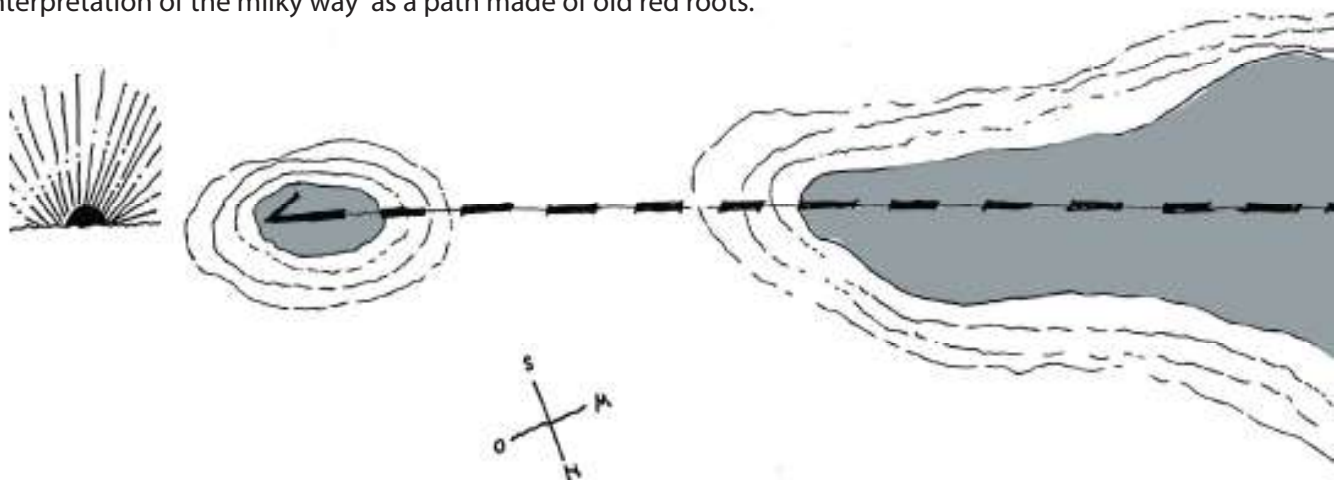


Fig 74. Interpretation drawing of the Milky Way as a path towards the rising sun.

THE MILKY WAY- A PATH TOWARDS THE RISING SUN

On the site, the main axis resembling the milky way has a east- west orientation. The visitor starts the journey from the west and walks in an eastward direction. This symbolizes that the milky way is believed to be the path towards the rising sun. This is inspired by the belief of the Northern Sotho that “first children” walked along the milky way towards the rising sun.

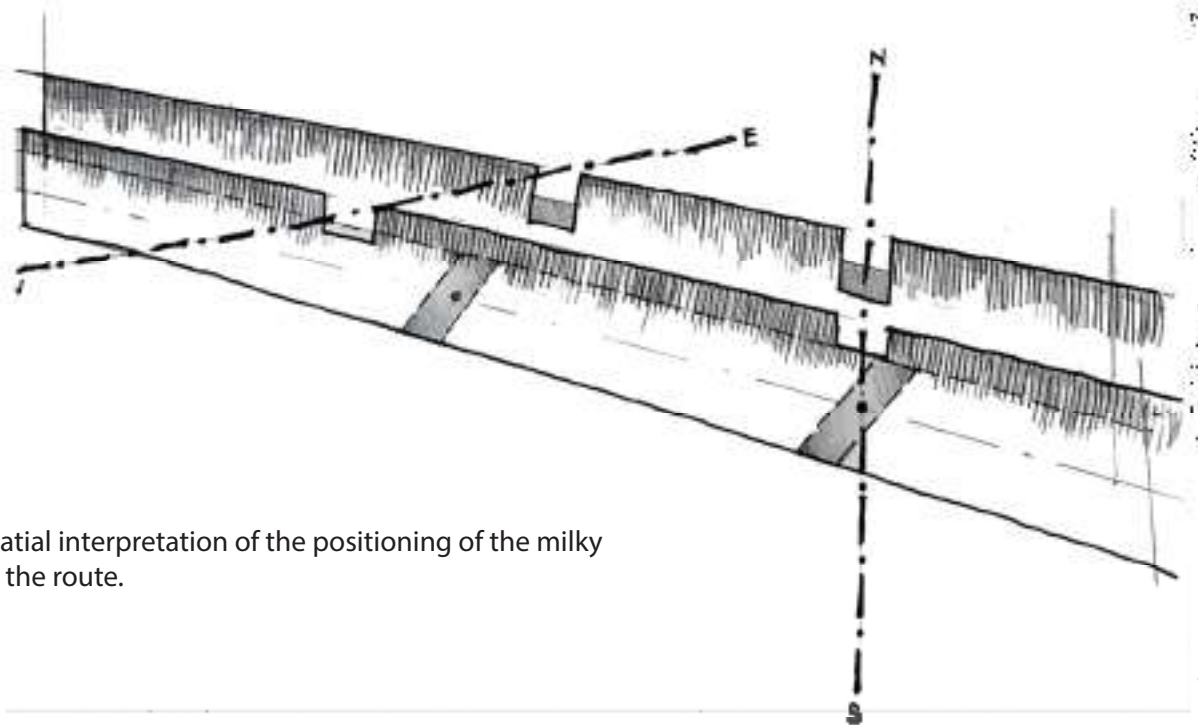
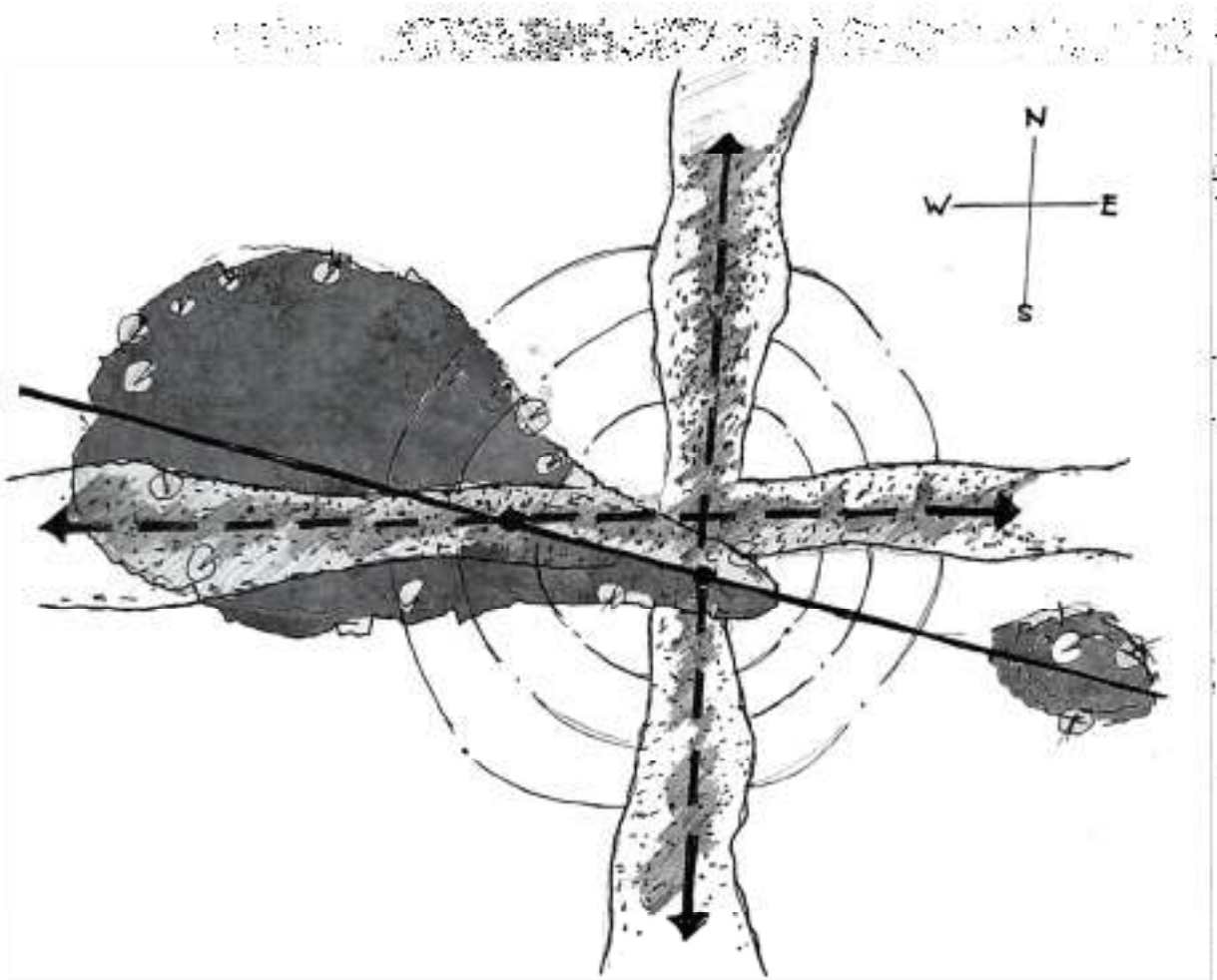


Fig 76. Spatial interpretation of the positioning of the milky way over the route.

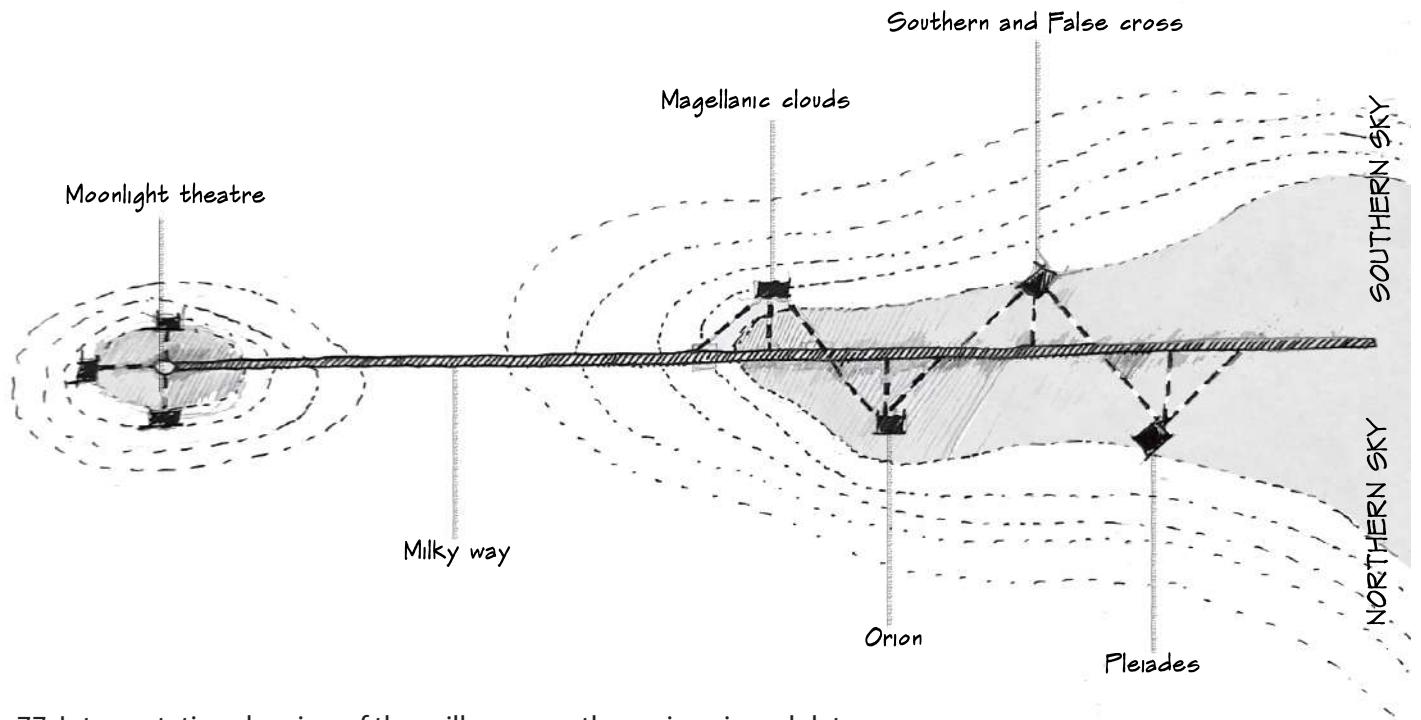


Fig 77. Interpretation drawing of the milky way as the main axis and datum.

The main axis road resembles the milky way which acts as a datum to organize the exhibition spaces. This was inspired by the poem of Kabbo which states that, "The wilky way must go round with the stars, while the stars sail along, they sail along on their footprints which they, sailing along, are following the sky lies still." The stars are those which go along," from the poem by Kabbo also inspired the idea of the milky way being the organizing datum for the stars. The exhibition spaces could be seen as sailing along or influenced by the positioning of the milky way. Therefore the exhibition spaces are organized alongside the milky way road.

This main axis resembles the milky way as it is numerously mentioned that they milky way forms a path for people to walk at night, for example when the Northern Sotho refers to the milky way as a path for the ancestral spirits and where Kabbo states that ; people go at night when the ground is made light when the milky way gently glows. The Xam story of the girl who throws wood ashes into the sky to create the milky way to provide light for her people to walk home during the night was also an inspiration for translating the milky way into built form and making it the main axis of the route.

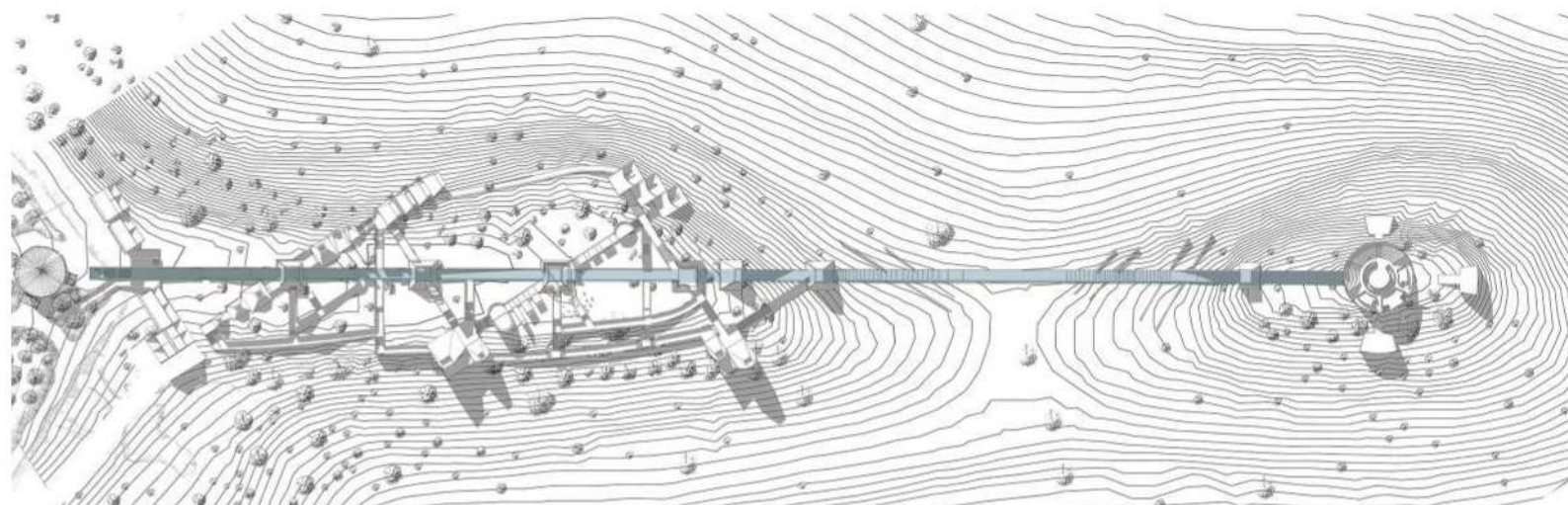


Fig 78. Key indicating the position of the milky way narrative-route.

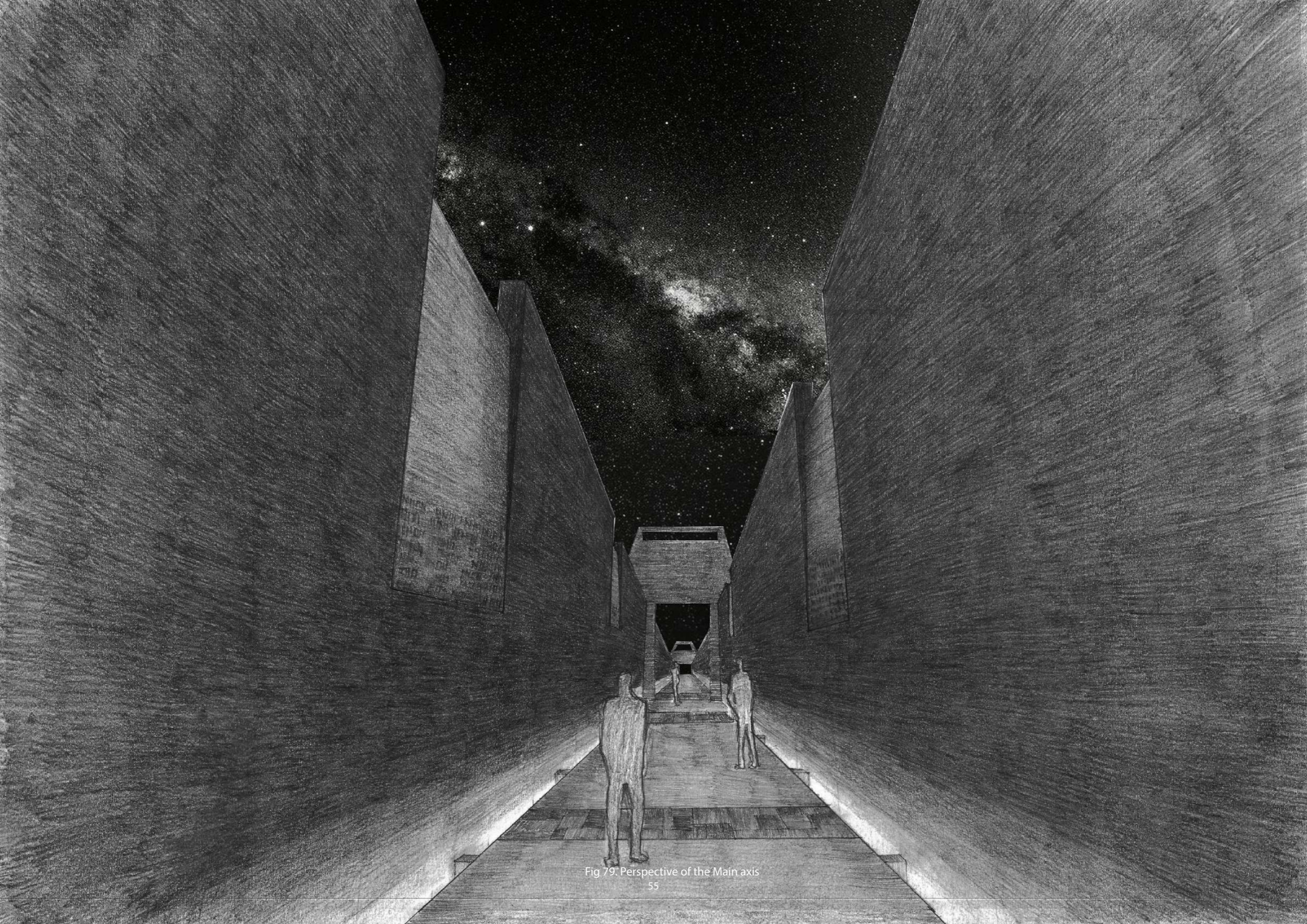


Fig 79. Perspective of the Main axis



Fig 80. Perspective of the basement path

7.2.3 ORION NARRATIVE OF CROSSING PATHS

In indigenous cosmology, Orion is not as practically used as the Pleiades, but it is rather a source of a lot of myths regarding hunting and prey being chased by predators. However, there is a story told by the Zulu that deviates from these narratives, and involves the movement of people during the night.

The Zulu called Orion *iMpambano*, which is derived from the verb *phambana*; the meaning of this is to lie across one another; cross one another or pass one another, in the manner that roads cross one another; or how people pass each other at night, but without observing each other (Koopman, 2002: 324).

The Sotho envisioned Orions Belt as three wild pigs, that were being pursued by a wild dog (Alcock, 2014: 242).

The Tswana called Orion *Dintsa le Dikolowe*. Orion's belt represented three dogs which were chasing three pigs, which are represented by Orion's Sword. Alcock, 2014: 249).

The Venda referred to Orions Belt- and Sword as *makhali*, meaning rhinoceros, with Orion's Sword representing the horn of the rhinoceros (Van Warmelo, 1989: 96).

A belief among the Khoikhoi was that Orion's Belt resembled three zebras. A hunter is sent to shoot the zebras. There was an Orion story that was associated with the Pleiades. The Pleiades told her husband to hunt the three zebras and not to return home if he missed with his arrows. The husband missed the zebra with his first arrow. The husband then sat there; having failed. A lion waits from a distance while watching the zebras, and preventing the man from retrieving his arrow. The man cannot return home to his wives; they cursed him. The husband is the star Aldeberan, and the lion is the star Betelgeuse (Schapera, 1965: 450).



Fig 81. Constellation: Orion (Berman, 2020: online).



Fig 82. South Sotho and Tswana story of three wild pigs being chased by wild dogs.

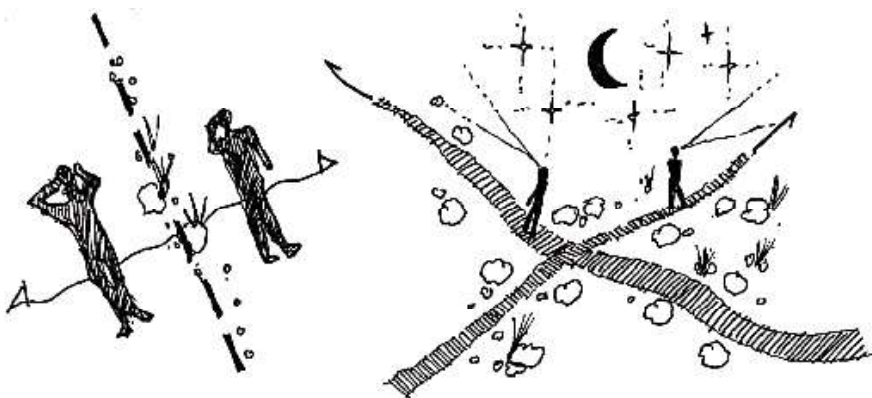


Fig 83. Zulu story of Orion meaning to lie across another and crossing paths.

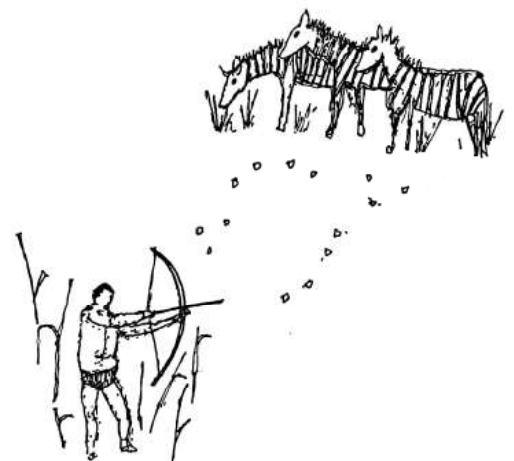


Fig 84. Khoi Khoi story of the hunter and three zebras.

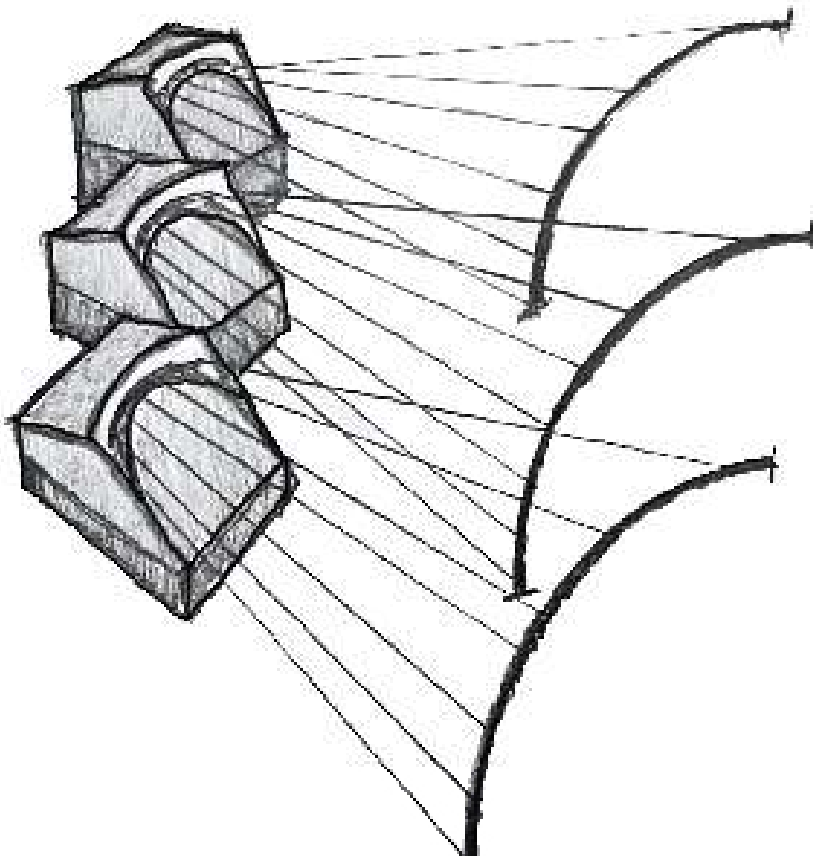


Fig 85. Spatial interpretation of framing the movement of the constellation Orion.

The formgiving of the Orion exhibition spaces were inspired by the circular movement of Orion in the sky. It is framing the specific path that Orion moves in the sky. The volumes are framing the astro-landscape.

The volumes are placed across one another, thus allowing the visitor to see into the next volume whilst standing in another volume. This is inspired by the Zulu translation of Orion, which has the meaning of; to lie across one another.

Three volumes are used in the Orion exhibition. This is inspired by the vast amount of folklore that has a reference to the number three. An example of this is the three zebras that the man is hunting in the Khoikhoi stories, or the three wild pigs that were pursued by a wild dog in the stories of the Sotho.

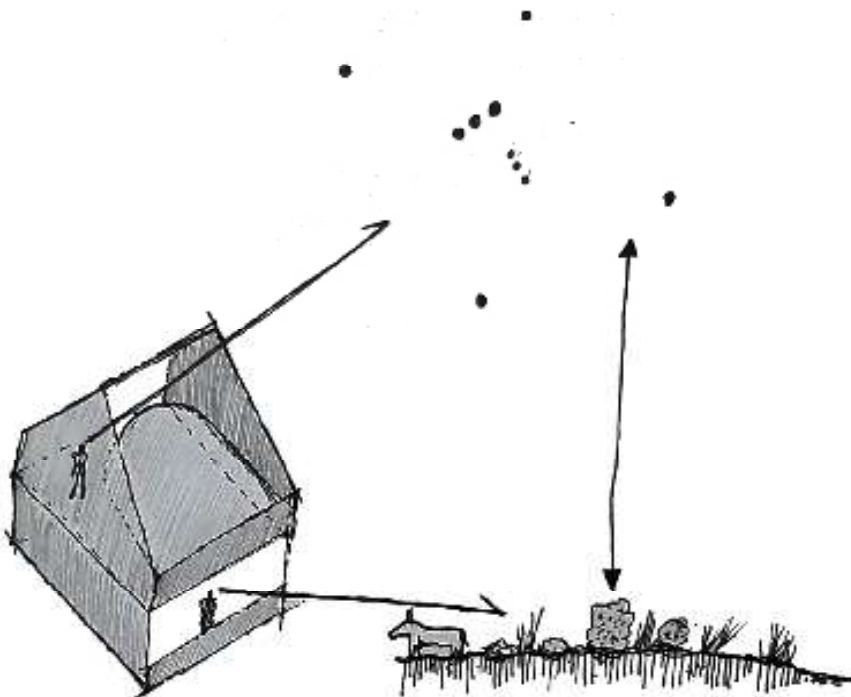


Fig 86. Spatial interpretation of the connection between the landscape and the stars.

Reading through the folklore, one realizes that a lot of indigenous cultures used nature to understand the stars, or make the stars relevant to their lives. This is prevalent in the connection the people made between Orion and the narrative of hunting, or pigs being chased by a wild dog. The stars of Orion are associated with events that the people saw in nature.

With this exhibition, the top volumes are framing the movement of Orion and forms a clear axis mundi. The bottom spaces of these exhibition areas are framing the landscape, and are meant to convey that there is a connection between events in nature and the stars; this is seen in folklore concerning Orion.

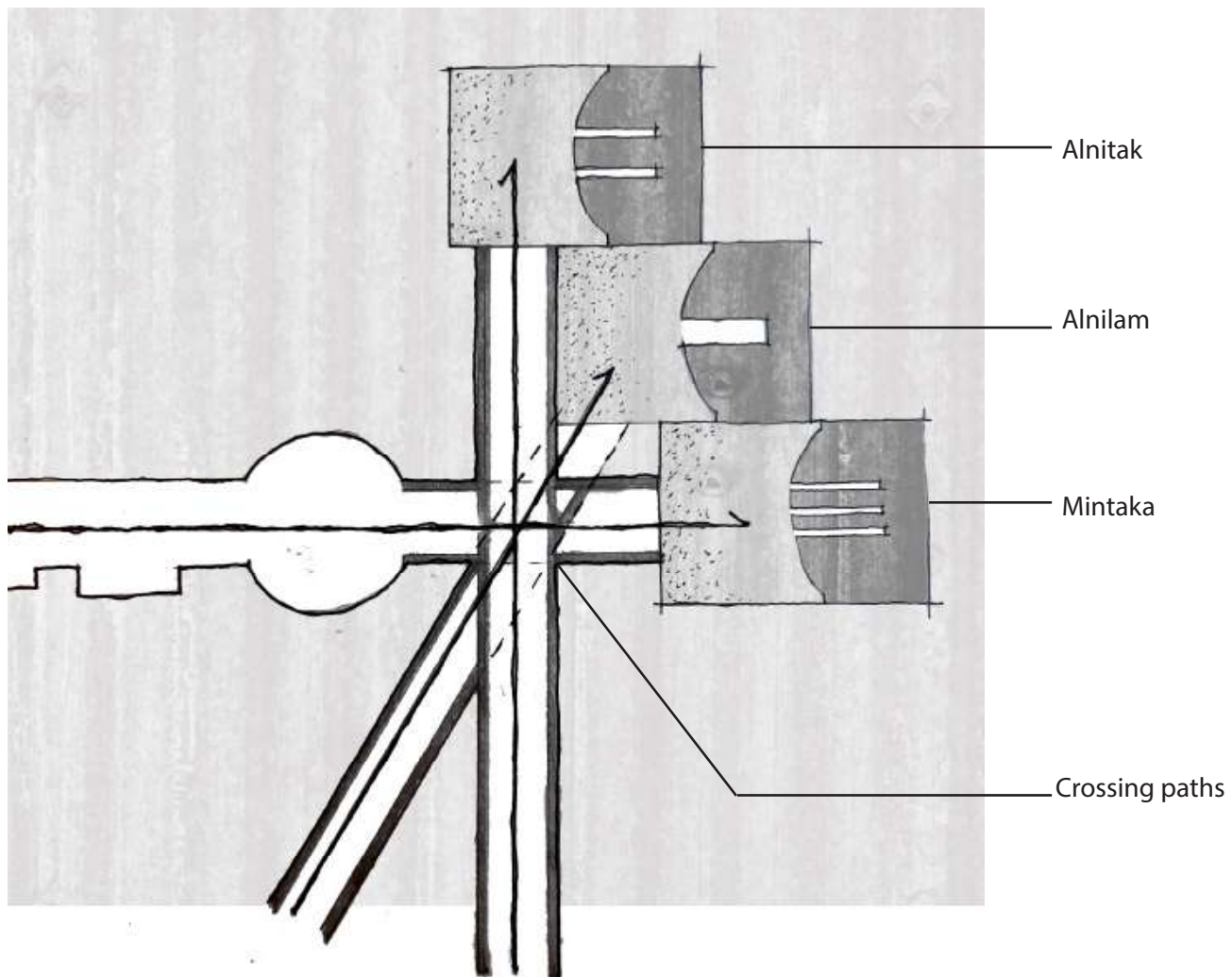


Fig 87. Diagram of the Orion exhibition, that indicates the symbolism in the layout.

The Orion exhibition is divided into three exhibition spaces. The three exhibition spaces symbolize the three prominent stars in the constellation of Orion, forming Orions belt, which are called Alnitak, Alnilam and Mintaka.

-Alnitak

Alnitak is a multistar system. The main component of this star system is a blue supergiant called Alnitak A. Alnitak A has a close binary stars which consists of two stars. These two stars are a blue giant star and a blue dwarf star (OSR, 2016: online).

In the exhibition space resembling Alnitak, two openings are in the roof symbolizing the two giant stars in this multistar system.

-Alnilam

Alnilam is a single large blue supergiant star (The Nine Planets, 2021: online).

This single supergiant star is symbolized in the single large opening in the concrete roof.

-Mintaka

Mintaka is also a multistar system. Three blue giant stars in the Mintaka system are symbolized by three openings in the concrete roof. Three paths that cross each other, without allowing travellers to see each other when they cross paths, lead to the three exhibition spaces. The three exhibition spaces also lie alongside each other, which was also a description used by the Zulu to describe Orion.

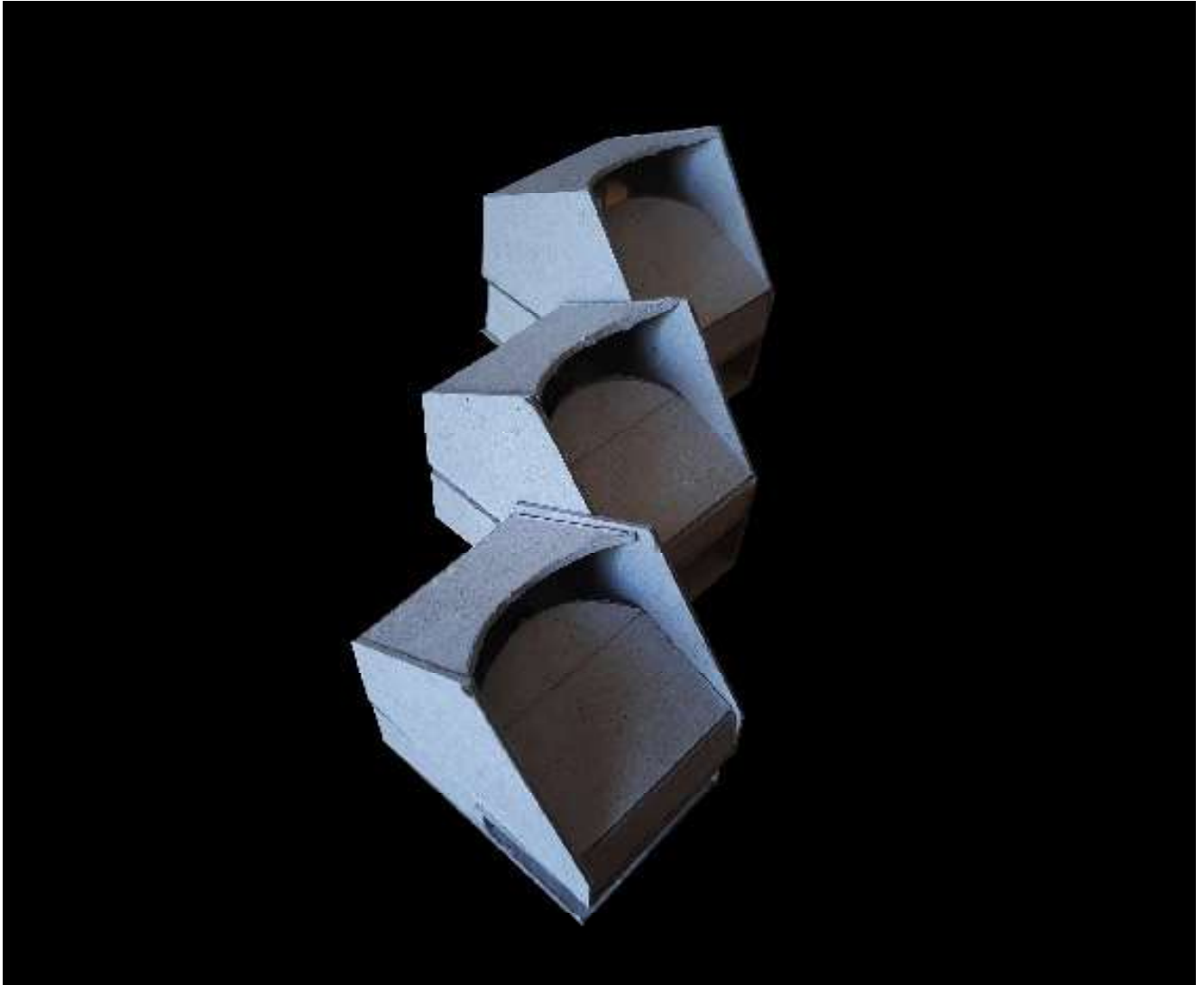


Fig 88. Model of the Orion exhibition.

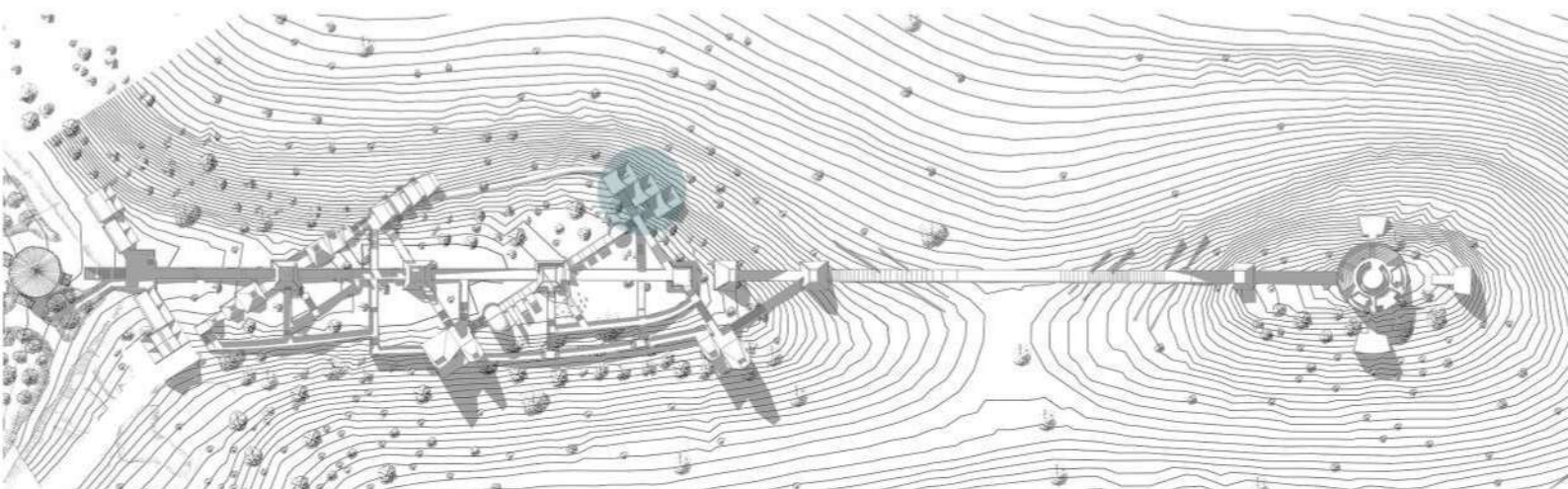


Fig 89. Key indicating the location of the Orion exhibition

7.2.4 THE SOUTHERN CROSS STORIES

If the Southern Cross set at dawn during the lunar month of October, the Northern Sotho believed that the first spring rains were near. The Northern Sotho had the same name for the southern cross and the giraffe. They called it *Thutlwa* (Krige and Krige, 1980: 336).

The Tswana called the Southern Cross *Dithutlwa*. They made an association with the giraffe and the Southern Cross. The stars that shine the brightest in the Southern Cross, which is called Alpha and Beta Crucis, is the male giraffe, while the other dimmer stars, Gamma and Delta Crucis, are the female giraffe (Ambrose, 2000: 156-167).

For the Venda, the two stars of the Southern Cross that were the most vivid represented *Tuda*, which means the giraffe. The two most vivid stars located in the Southern Cross were called *nsandzi*; meaning female and the two pointers were called *ndona* which means male (Stayt, 1931: 392).



Fig 90. The Southern Cross is a collection of stars that belong to the constellation the Crux (Rao, 2015: online).

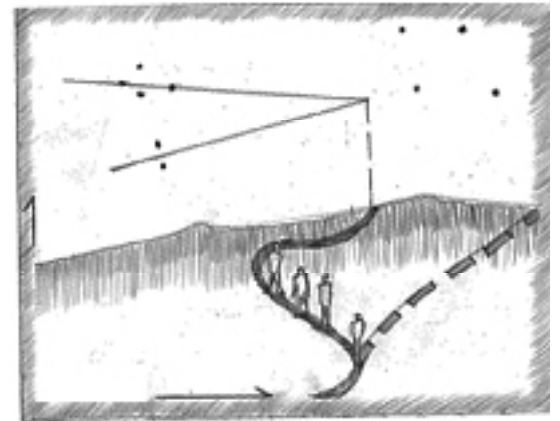


Fig 91. Travellers use of Southern Cross while misguided by the False Cross.

7.2.4.1 SPATIAL INTERPRETATION OF THE ORION STORIES

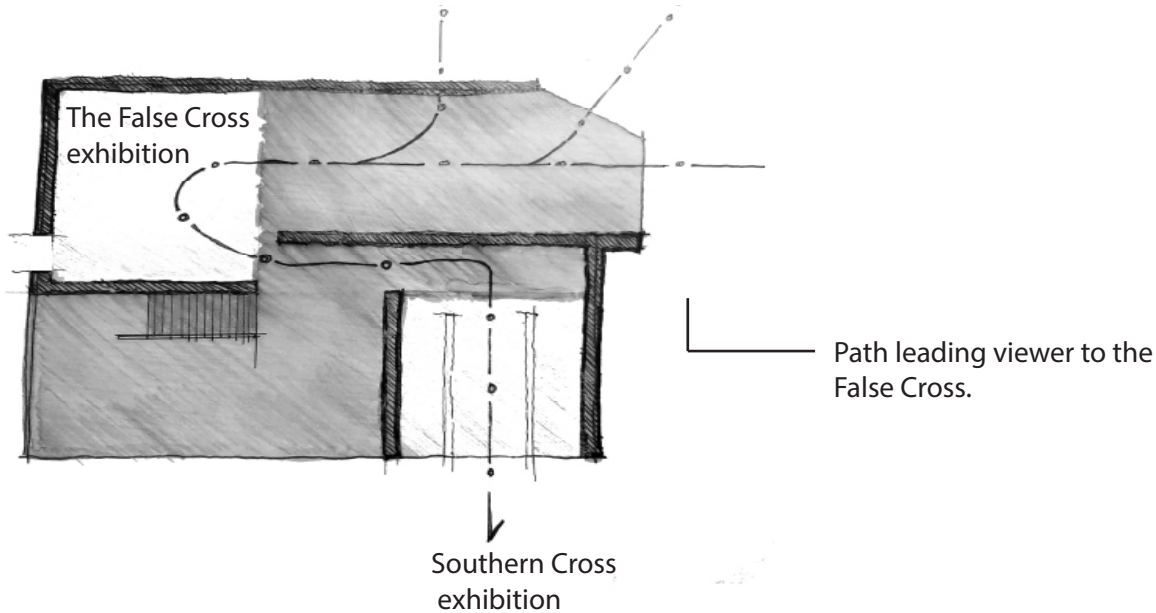


Fig 92. Diagram of the Southern Cross exhibition

The Southern Cross exhibition is inspired by the narrative of the relationship between the false cross and the southern cross. The False Cross is known for confusing travellers and leading them in the wrong direction. The False cross is often confused with the Southern Cross. The False Cross is bigger than the southern cross and also dimmer.

The layout of this exhibition takes the viewer off course towards the False Cross. After the viewer arrived at the False Cross, he/she is directed towards the Southern Cross. This is an attempt to embody this experience of the False Cross confusing travellers. The top volumes open up towards the Southern and the False cross. The openings are positioned to allow viewers to see the False Cross and the Southern Cross at the same time. The openings are positioned to allow people to see both phenomena when the southern cross is located highest in the sky.



Fig 93. Model of the Southern Cross exhibition.

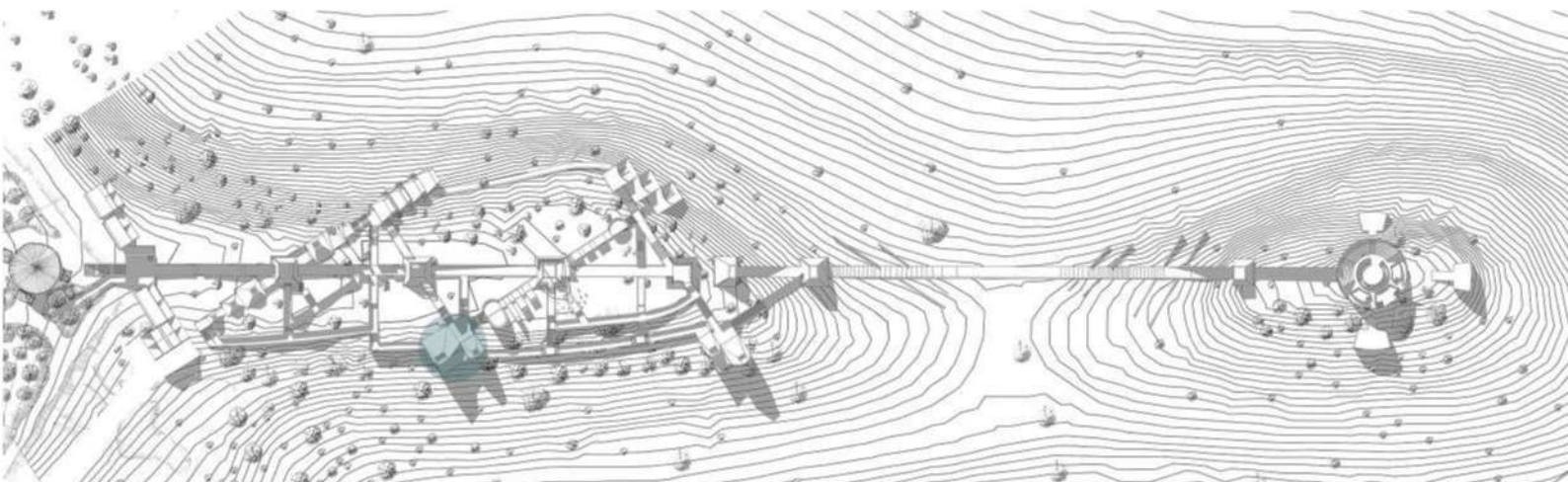


Fig 94. Key indication the location of the Southern Cross exhibition

7.2.5 THE MAGELLANIC CLOUDS- STORIES

The Tswana called the Large Magellanic Cloud; *Kgoli* and the Small Magellanic Cloud was called *Tlala*. They believed that that a drought was nearing when the Small Magellanic Cloud was clearer or on top of the Large Magellanic Cloud. If the reverse occurred it meant that a time of agricultural plenty was near or abundance of crops. Medupi stated that the two galaxies resembled *Khoro*; this meant abundance of food or *Tlala*; which meant that there was going to be a famine. The reasoning was that the Small Magellanic Cloud was dimmer than the Large Magellanic Cloud when there was a lot of dust in the air; this was therefore associated with draught. It is a fact that the Large Magellanic Cloud is lower than the Small Magellanic Cloud during spring up until the start of summer which are the months in which rain is expected (Alcock, 2014: 249-250).

For the Khoikhoi, the glimmer of the Magellanic Clouds and the Milky Way resembled the dull shimmer of the embers of a fire. The Magellanic clouds were referred to as *tsaora* which means Embers. The name *tsaora hasa* was feminine and dual ending that reflects the clumpy form and littleness of these celestial objects (Hahn, 1881: 154).



Fig 95. The Small- and Large Magellanic Clouds are galaxies (Sessions, 2020: online).



Fig 96. Embers forming in a fire

7.2.5.1 TRANSLATION OF SMALL AND LARGE MAGELLANIC CLOUDS INTO BUILT FORM



The Magellanic Cloud narrative of embers is translated into two gathering spaces with elements that symbolize glowing embers. These spaces are intended for the retelling of stories concerning the stars and people's experience of the stars. These two volumes symbolize fire places where people will come together to tell stories and where embers are formed.

The top volumes are positioned to frame the Large and the Small Magellanic Clouds during a certain time of the day. This occurs when the Large Magellanic Cloud appears highest in the sky.

Fig 97. Diagram of the Magellanic Cloud exhibition

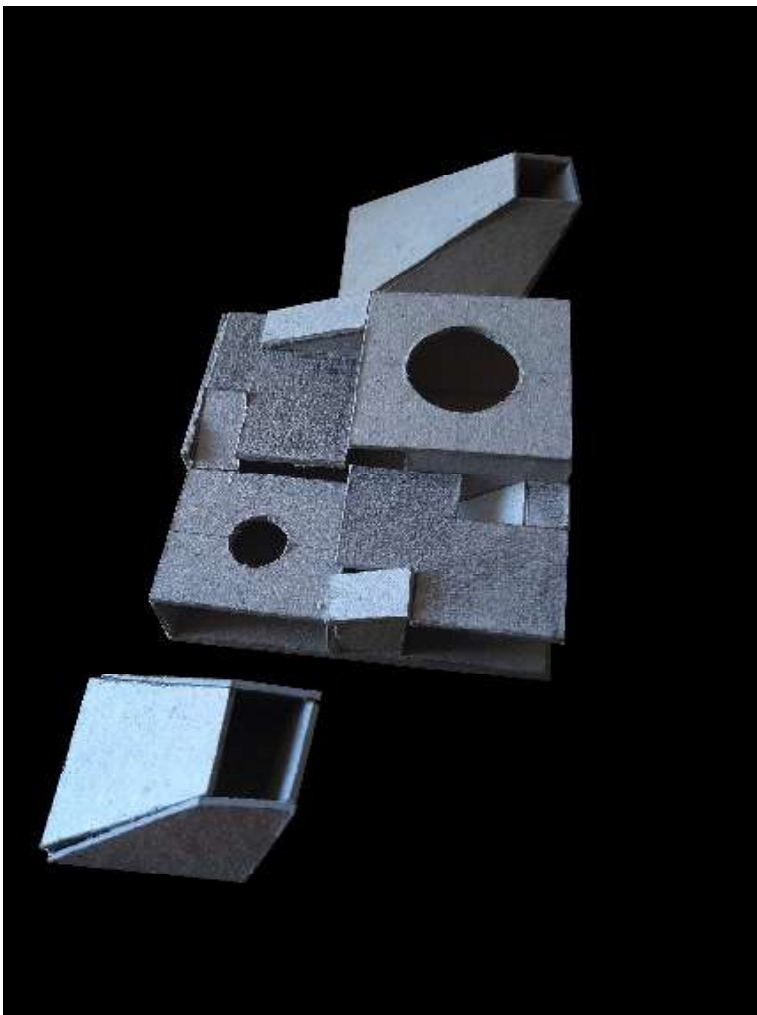


Fig 98. Model of the Magellanic Cloud exhibition

7.2.6 THE MOON STORIES

The arch shape of the moon looked like a veld shoe that is curled and bears resemblance to a feather. The red dust of the moon was associated with sands that were common to the Kalahari and southern regions of South Africa due to its red colour. The explanation for the moon having a red colour was because the shoe was covered in red dust (Hewitt, 2008: 254).

The sun is angry at the moon. This is because it can build itself up to shine like the sun during full moon, and to give out light even when it is in a waning state. The moon is then attacked by the sun, due to its anger. The sun later takes pity on the moon. The moon surprisingly still emits some light during this stage with the permission of the sun and for the sake of its children. The light is a sign to the moon that it will return to its full size again. The full moon which is being attacked by the sun is red in colour; this signifies blood (Hollmann, 2007: 8-12).

The moon was a symbol of renewal to the Xam. Three narratives were produced on the waxing and the waning of the moon.

The moon is envisioned as begging to be spared by the sun and crawls back home. The moon then stays out of the sun's sight and only walks by night until it grows fat and regains its strength. The moon then proudly runs before the sun and is then cut again.

The moon is seen as a decomposed piece of meat that holds on to its backbone. The moon regenerates due to the increasing number of the deceased. The hollow or cavity of the new moon was the catching place of the deceased. As the moon increases in size due to the growing number of the deceased, the dead is revived with moon water.

The moon was personified and seen fit to intervene with the affairs of the Xam, while the sun lives in solitary existence on earth and in the sky. The sun does not want company in the sky, hence the conflict between the sun and the moon (Alcock, 2014: 105-106).

The O Kung, like the Naron and Auen, perceived the new moon as giving rain. They often prayed to the moon for rain (Alcock, 2014: 111).



Fig 99. The new moon (Groome, 2018: online).

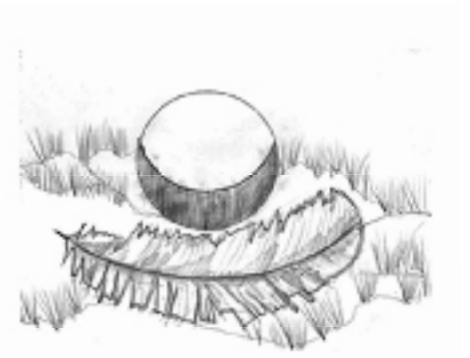
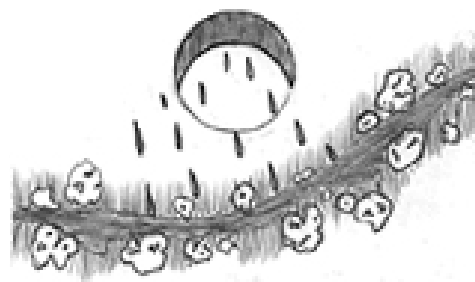


Fig 100. San story of the moon symbolizing a feather and the red sands of the southern regions of South Africa.



Fig 101. San story of the moon being a decomposed piece of meat clinging to its backbone.

The Khoikhoi dispised the moon as all diseases, beasts and disasters were attributed to the moon. Khoikhoi marraiges took place during full-moon and the Khoikhoi often held dances with music from reed pipes during full moon. This was mainly done due to the light the full moon provided during the night (Alcock, 2014: 118).



According to the Zulu, the moon died monthly and regenerated again or else a new moon was made. The Zulu believed that the days devoured the moon which leads the moon to conceal itself in the sun when it became very small. A similar story told by the Zulu is that the days devoured the moon which made the moon as thin as a man's nail. The sun then found the moon when it was fragile in the east, got it and moved with it until leaving it in the west where the moon is visible.

Fig 102. Zulu story that if the new moon faced downwards it is regarded as empty and no rain is expected.

A waning crescent moon in summer lying on its back with the the points or cusps of the crescent level turned up meant that heavy rains and floods are very probable to occur in the next five days. If the crescent bowl of the new moon faced down towards the earth it was regarded as empty and no rain could be expected that month. The Basotho, Zulu and the Xhosa believed that a lunar halo was a sign that rain could be expected. A Zulu belief was that moonlight was the best time for people who are in love to visit each other and that only unsuccessfull couples venture out during dark nights. Some of the craters on the moon bear resemblance to a woman carrying a child on her back with wood sticks on her head (Alcock, 2014: 120).

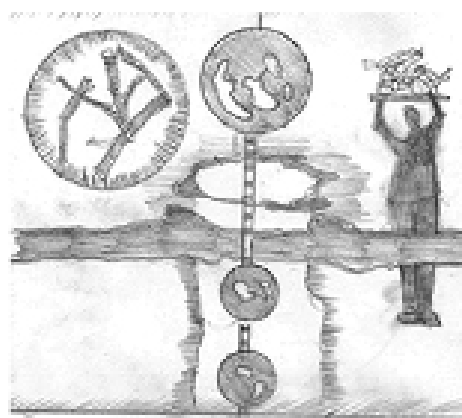


Fig 103. Xhosa story of moons being stored in a vast pit.

Some of the Xhosa believed that the horizon of the sea was the end of the world. They believed that the sea ceased to exist past the horizon and beyond that a vast pit was located. They believed that moons were stored in this pit. According to them a new moon was taken from this pit and placed in the sky each evening (Soga, 1931: 431).

The Swazi together with other South African indigenous groups coupled the lunar and solar year. The sun and the moon was connected with human destiny, where we are born and grow, but also age and die. When the moon was round and full it meant that a person was healthy and shining although puny and weak in the increasing darkness of the moon. The size of the Moon determined when different kinds of ceremonies were held. The ceremonies were held relative to the size of the moon (Kuper, 1944: 230-256).

The moon was a sign of growth and continuity to the Northern Sotho. The Northern Sotho, especially the children cheered when the thin, new moon appeared in the sky. No trees were cut and work stalled in the fields the next day as this day was seen as a day of rest in order to not disturb the moon and allow it to grow and become strong (Alcock, 2014: 129-130).

The Southern Sotho had a custom associated with the new moon. They filled a glazed earthen pot with very clear water when the new moon was anticipated. They claimed that when the crescent appeared, it was reflected in the water. The first man who saw the crescent reflected in the water reported it to the chief. The chief then announced that this had happened and sent out messages to summon the people to a feast. The crescent moon is indicative of rainfall to the Basotho. If the new crescent moon is facing upwards, not necessarily with the horns level, it means that the month will be dry. The moon is collecting the water and preventing it to fall to the earth. In the converse situation the water or rain reaches the ground. The Basotho thought that the angle of the crescent indicated the amount of rain that could be expected (Ellenberger, 1912: 396).

When the waxing moon is hollow it was said to be carrying disease. When the waxing moon is inverted it spreads the diseases out on the Tswana. A new moon with a vertical crescent indicated rain. If the crescent of the moon is inclined it meant that no rain could be expected. The moon in a slanting position is also said to pour out disease. The Tswana typically danced when it was new moon. A lot of wishes were also made to the new moon. A man was said to have collected firewood on a day that work was considered taboo. The man was banished to the moon where he is required to carry thorn bush or firewood around, and where he is also required to prepare leather (Clegg, 1986: 45).

The Tsonga believed that every moon was a rebirth and that the previous moon died. It was believed that the sun and the moon has a race each month. The new moon was considered 'not yet firm' as a newborn baby and therefore has a feeble light. The moon is dominated by the sun but fights back and grows. The sun recognizes that the full moon is something to be reckoned with, and when the moon loses its size it delays in the sky with the sun soon overtaking it. The moon is completely vanquished thereafter (Alcock, 2014: 137).

The Xam used the moonlight to hunt porcupines and other nocturnal animals as well as lie and wait for game at waterholes. The moonlight extended the time that the Xam could use to hunt. The full moon was especially useful for this (Alcock, 2014: 105).

7.2.6.1 THE LUNAR CYCLE OF THE SOUTHERN HEMISPHERE

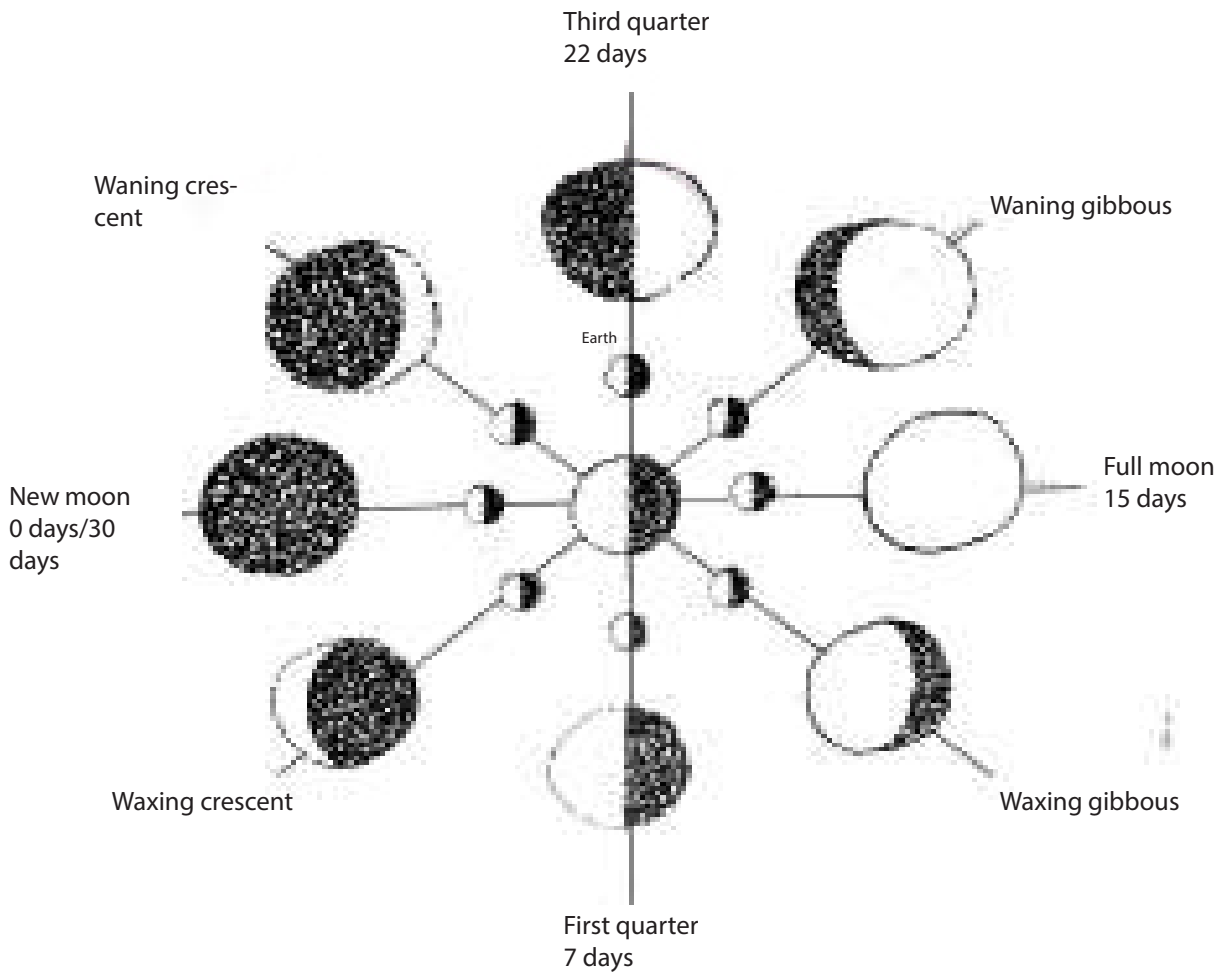


Fig 104. The lunar cycle

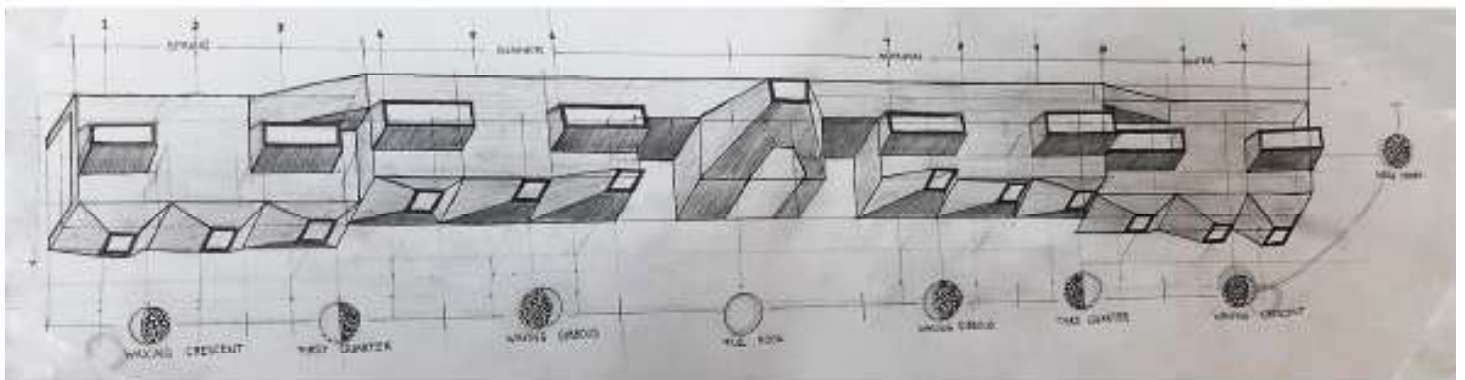


Fig 105. First attempt to solve the moon narratoscope through the use of the heights of the new moon each month.

THE NEW MOON

The new moon can only be seen during a solar eclipse. It rises and sets with the sun.



WAXING CRESCENT

The moon rises after sunrise and follows the sun and is seen in the west during the sunset. The crescent grows in size.



FIRST QUARTER

The moon rises at the time when the Sun is highest in the sky at noon. At sunset the moon is highest in the sky. The moon sets at midnight



WAXING GIBBOUS

The moon rises after noon and sets before dawn and is highest in the sky in the late evening. The gibbous grows in size.



FULL MOON

The moon is opposite the sun. At midnight the moon is the highest in the sky. The full moon sets in the west as the sun rises in the east and rises in the east as the sun sets in the west.



WANING GIBBOUS

After sunset the moon rises and after dawn it sets. The moon is highest in the sky after midnight. The gibbous shrinks in size.



THIRD QUARTER

At midnight the moon rises and at sunrise it is highest in the sky. At noon the moon sets in the west.



WANING CRESCENT

The moon rises after midnight and sets after noon and appears in the east before sunrise. The crescent shrinks in size



Fig 106. Stages of the Lunar cycle

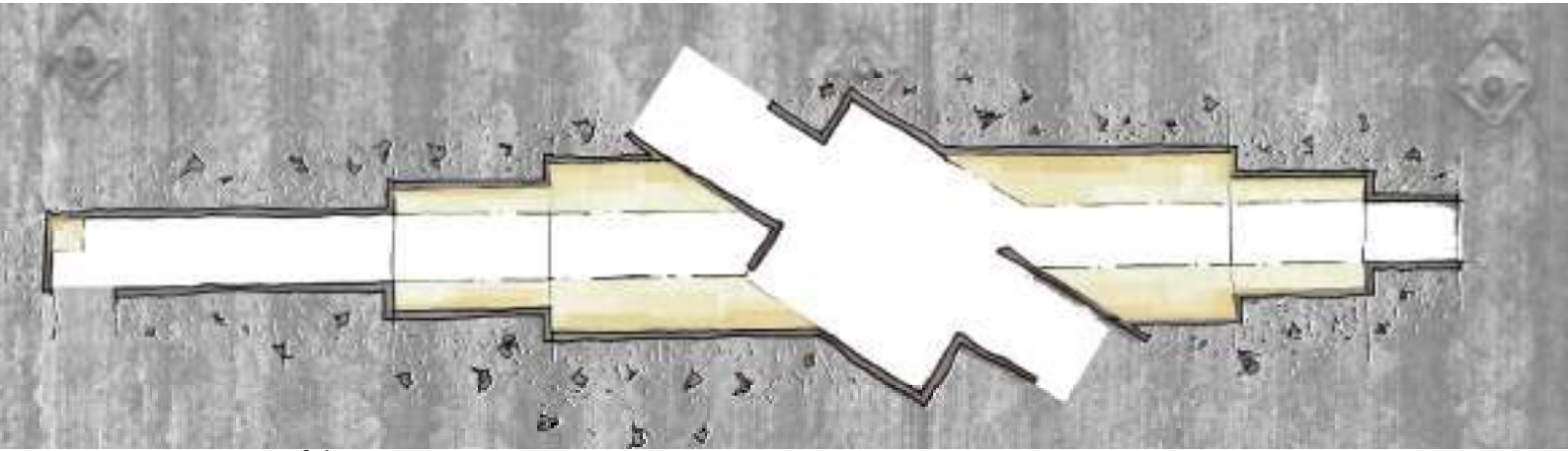


Fig 107. Diagram of the moon-narratoscope.

The moon exhibition is divided into segments that frame the different full moons seen during the year. The spaces grow and shrink in size and are also illuminated more or less to symbolize the sun that is cutting away at the moon during its waning state. The state of renewal is also expressed within the structure by the volumes growing in size up until the central gathering space. The bridge goes through volumes that shrink in size. The bridge symbolizes a backbone while the volumes that seem to grow in size as one walks on the path symbolizes a piece of meat, clinging to its backbone, that grows and diminishes depending on the direction the viewer is walking.

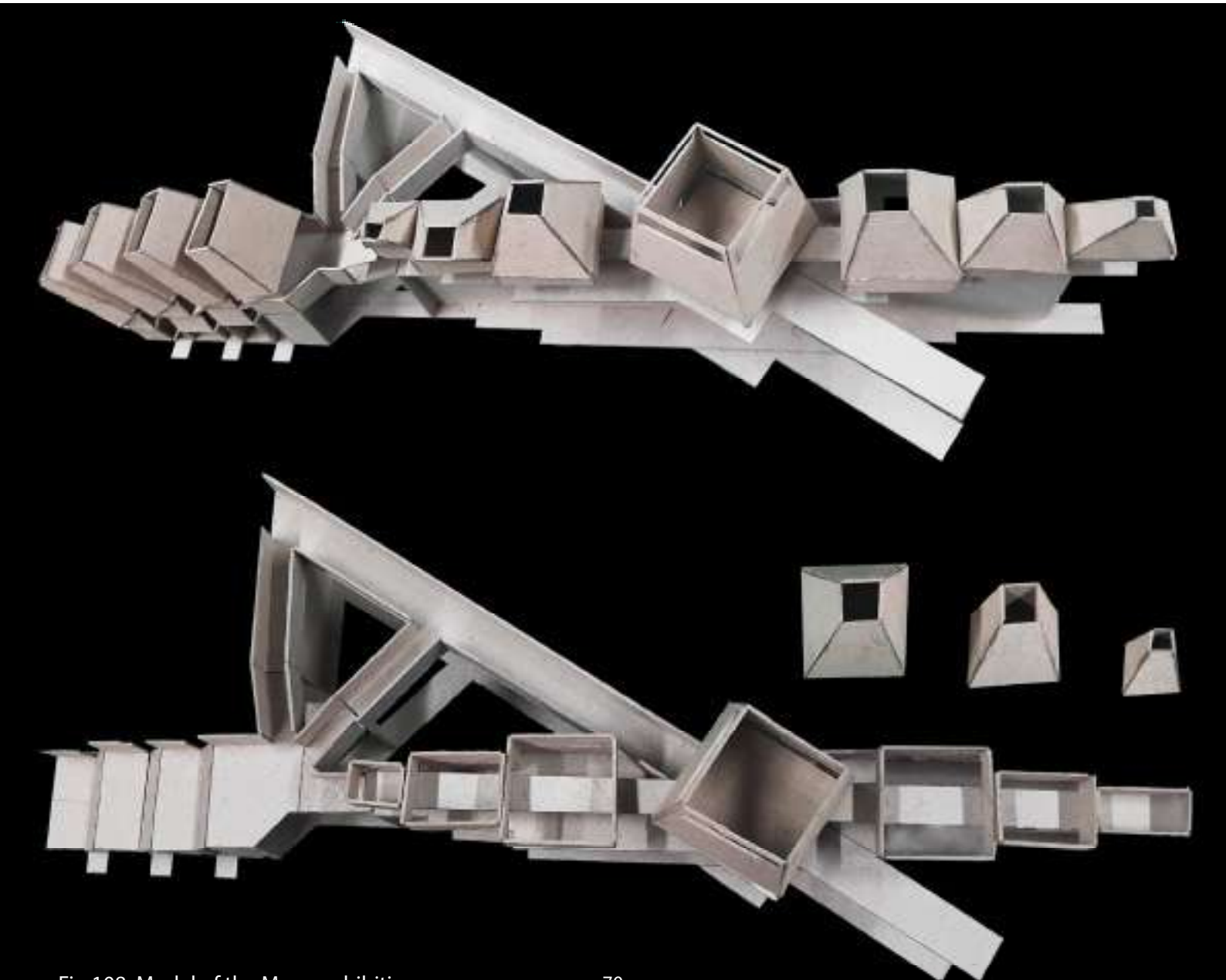


Fig 108. Model of the Moon exhibition.

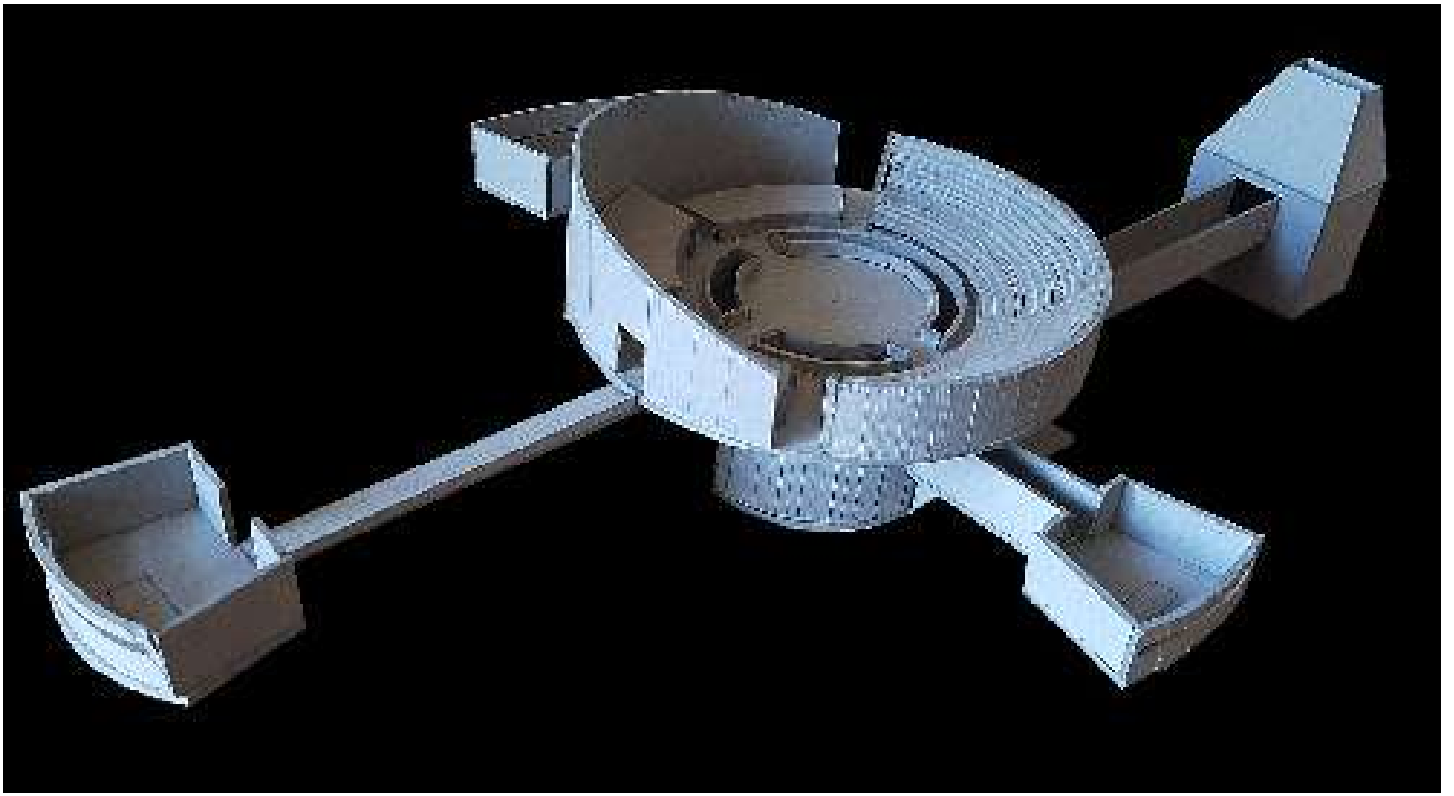


Fig 109. Model of the moonlight theatre.

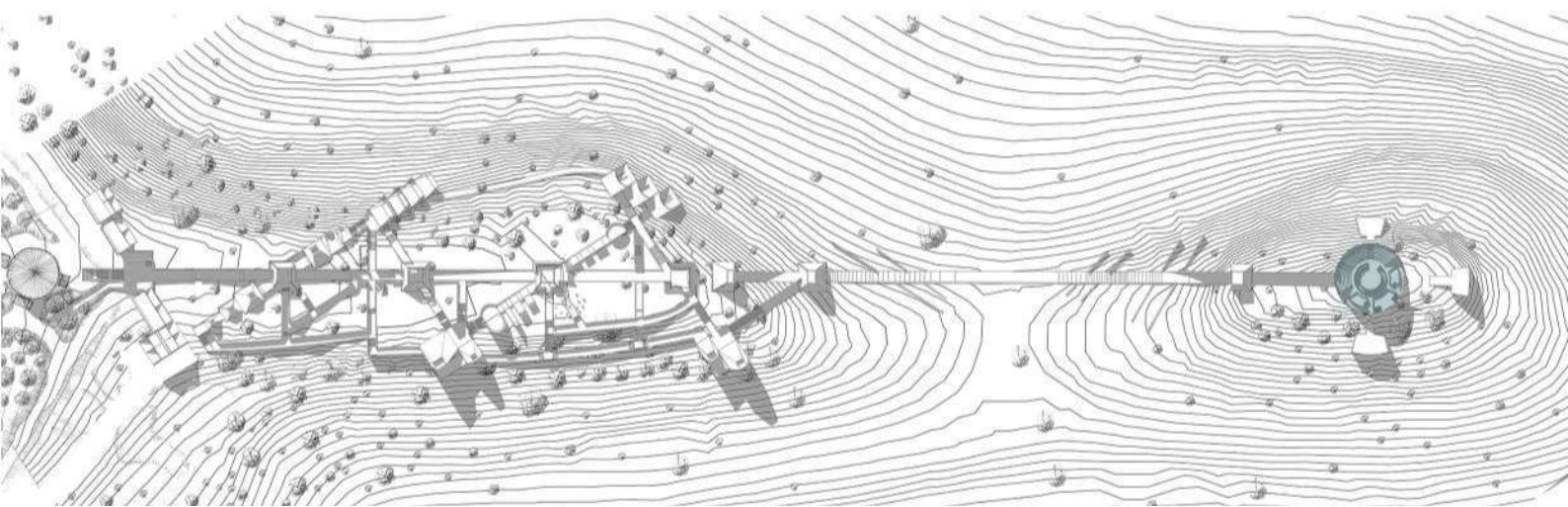
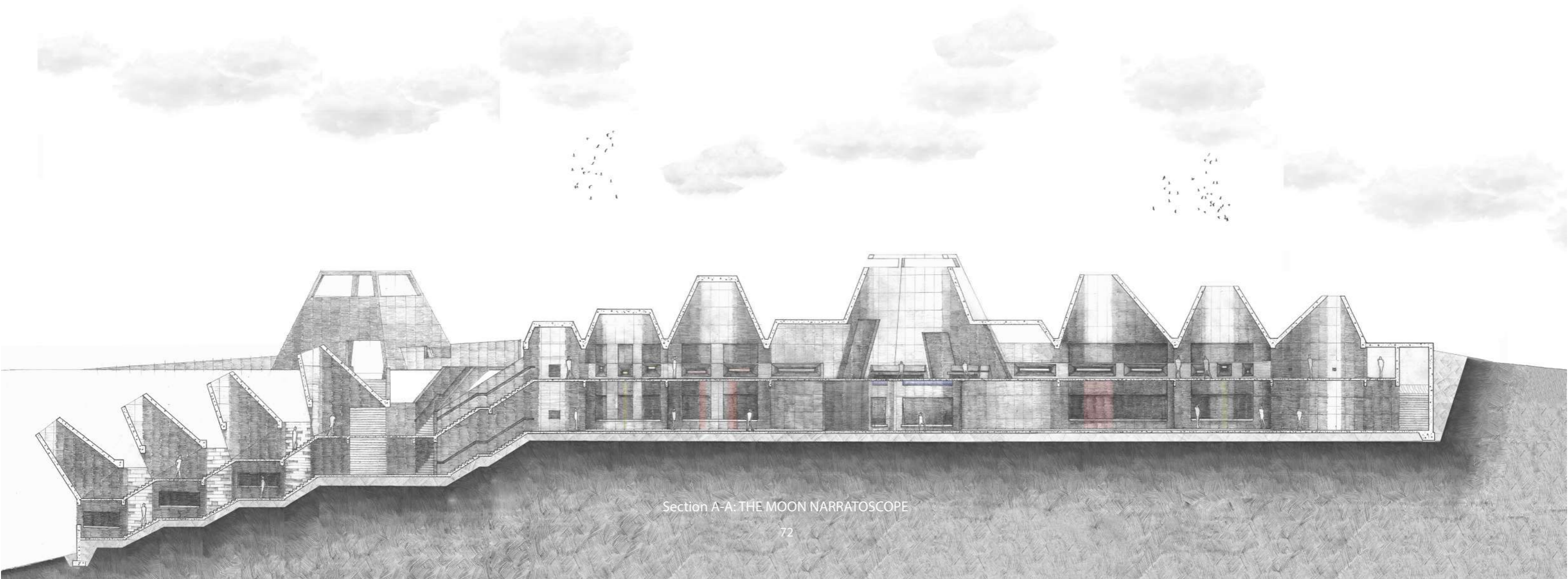
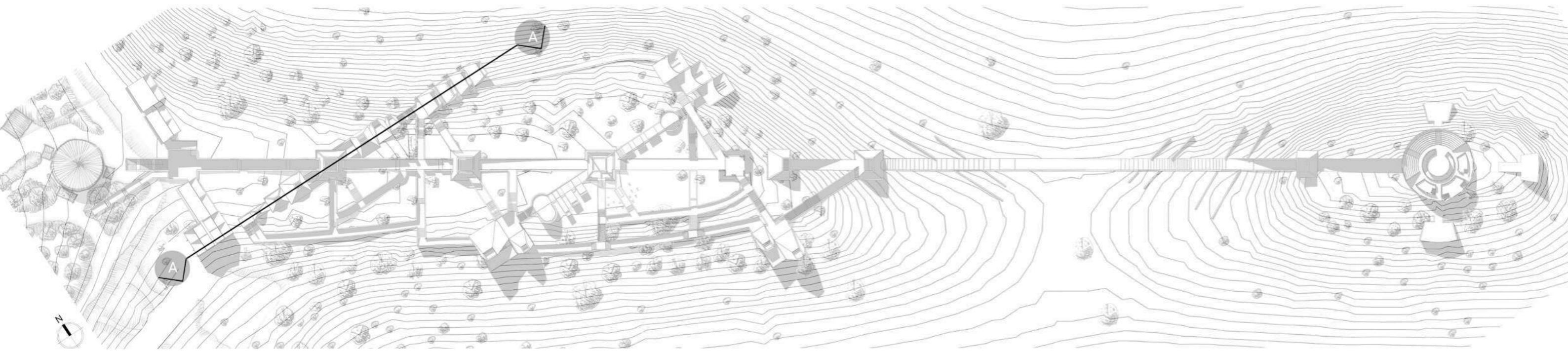


Fig 110. Key indicating the location of the moonlight theatre.



Section A-A: THE MOON NARRATOSCOPE



WILLIAM ROBINSON - ELLEN SCOTT - IRMA AVEYARD
KAREN NOWSKI - JUNE KARENOWSKA - HELEN SAUNDERS
ROBINSON - ELLIOTT ANN HOWITTUM - MARY HOWITTUM
JEL - JOHN THUDY - ROSIE HOWWOOD - BECCA HEYWOOD
LIS WOLINSKI - JULIE ANDERSON - CALLUM BERTON
N PILLAN - JUDY HOLSTON - SAMUEL JAMES DARTON

WILLIAM ROBINSON - ELLEN SCOTT - IRMA AVEYARD
KAREN NOWSKI - JUNE KARENOWSKA - HELEN SAUNDERS
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LIS WOLINSKI - JULIE ANDERSON - CALLUM BERTON
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Fig 111. Perspective of the moon narratope on ground level.

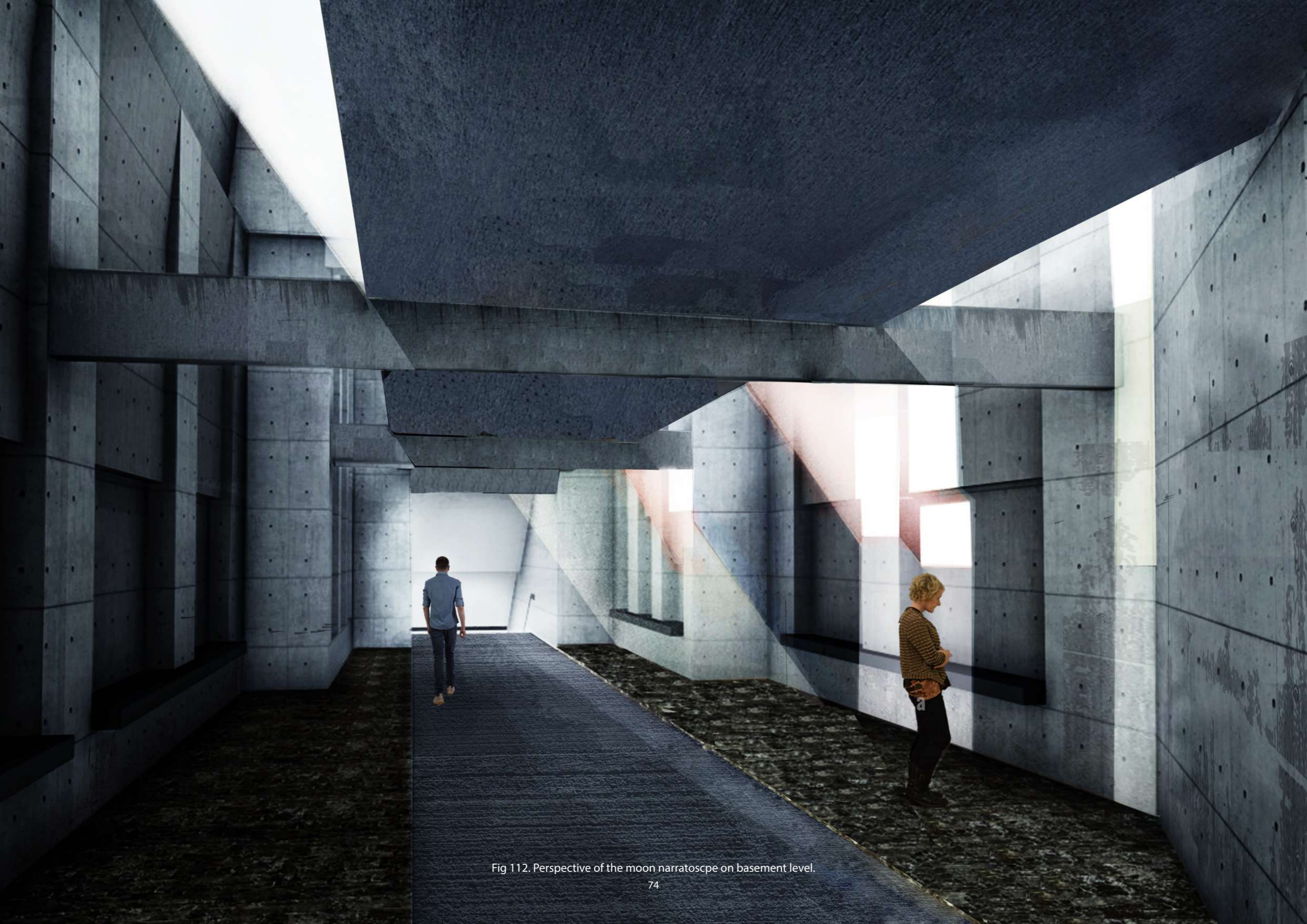


Fig 112. Perspective of the moon narratoscope on basement level.

7.2.7 THE SUN NARRATIVE OF - JOURNEY FROM SUMMER TO WINTER HOUSE

A lot of indigenous cultures of South Africa were aware of the shifting position of the rising and the setting sun. The Northern Sotho term for solstice is *Seremo* which refers to the sun sanding still. The Northern Sotho were well acquainted with the two points where the Sun turns on the two solstices. The Tswana linked the summer and the winter solstice to two houses of the Sun, a summer and a winter house, because the sun seemed to rest at these points for a few days (Alcock, 2014: 64).

The San believed that the sun followed the spoor of the moon in the sky. A common belief is that the sun covers itself with a blanket at night when it is cold. It is an old blanket and therefore has a lot of small holes in it. The stars at night are the sunrays shining through the holes in the blanket. There was a belief that when the sun sets in the west darkness is caused by the trees in the far country. Darkness is caused so that man can sleep and cause nocturnal animal to move around a night. Another reason for darkness was that the *Nadima* could catch the sun and eat its outer body. The true body of the sun is then carried to the far country in the east. The next morning the sun rises with its newly regenerated body. The Milky Way is one of the paths used by *Nadima* to carry the sun.

The Northern Sotho believed that the sun moves on its underground orbit. The course of the sun was related to a river. The sun has water through which it revolves.

The Swazi believed that the sun made two great journeys across the sky each year. According to the story, the sun travels southward until it reaches the southern solstice where it rests in its hut. After the sun rested, it returns to the north where it rests at the winter solstice.

The Khoikhoi used the sun as their primary way-finding mechanism.

The position of the sunrise served as a guide for the Zulu to tell them what kind of crops could be planted during that time of year. Fixed posts or large trees seen from the same angle were used to mark the seasonal positions of the sun.

The Zulu believed that the sun had a summer and a winter house. According to a story, the sun goes to its summer and winter house. It was said that the sun goes to a certain mountain or tree in the north where it stays for a few days. After a few days the sun returns to the south to fetch the summer.

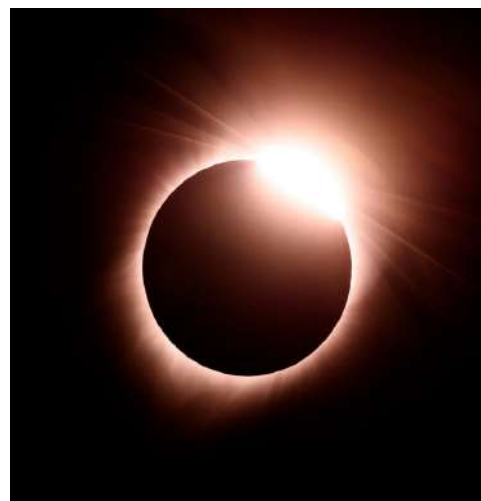


Fig 113. A solar eclipse (Lee, 2020: online).

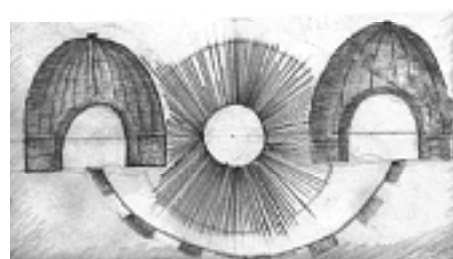


Fig 114. The journey of the sun from the summer- to the winter hut (the summer to the winter solstice).

The Xhosa and others in South Africa used the sun to temporarily indicate time. Any hour was indicated by pointing at the position of the sun at that time. This was done to arrange a meeting at a certain time that day or a few days later. Any activity for example weeding extended over two positions the sun would reach in the sky, taking into account the lower angle of the sun and the shorter days in the winter as opposed to the higher angle and the longer days in the summer. The length and orientation of shadows were also another indicator of time and the progress of the sun (Alcock, 2014: 63).

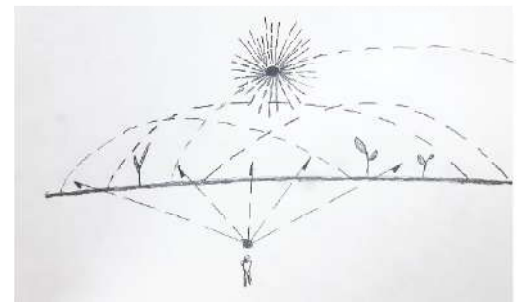


Fig 115. Changing positions of the sunrise.

The Southern Sotho referred to the winter solstice as *bokhutlatsatsi* meaning: "when the sun returns". The position of the sun on at the winter solstice was called the homing position or *Letsatsai le Kene Tlung* meaning the sun has entered its home by the Basotho. The Northern Sotho's name for the solstices is *seremo* which refers to the standing still of the sun (Alcock, 2014: 64).

The Venda term *ombela* which means knock in as a peg or a nail of the sun was used to describe the the points furthest north or south reached by the sun or the summer and winter solstice.

7.2.7.1 SPATIAL INTERPRETATION OF THE SUN STORIES

The model represents the route that is thought to be travelled by the sun. The model is organized as a route with two destinations on each side and a communal space in the middle. The destination point on the right represents the sun's winter hut, as previously mentioned in the indigenous cosmology, which is the point the sun reaches when it has travelled the furthest to the south, also known as the winter solstice. During the winter solstice the sun's rays shine at the lowest possible angle from the horizon. The model was designed to allow this low angled light to fall into the model, on the right side of the model, during the period of the winter solstice up to the time of the equinox.

The destination point on the left represent the summer solstice. During the summer solstice the light emitted from the sun shines from the highest possible angle from the horizon as the sun almost travels straight overhead. The model was designed to allow the light that is emitted from a high angle to filter into the building, lighting up the walkway.

The destination points are shaped in a circular form to represent the sun's hut, the shafts between these points are carefully angled to allow the sunlight to fall deeper or shallower depending on the point in the route and its proximity to the winter or summer solstice point. The idea behind this is to make it seem that the light is travelling through the route and rests at the ends when light is directly falling on that section of the route

The volume in the middle represents Venus, as the San said that Venus guided the sun across the sky. It also made sense to place this volume in the middle of the route as it is said that Venus reminds travellers that sleep out in the open that it is time to resume the journey. The middle volume in the model is also a resting point in between the two destinations, and so it makes sense that this volume represents Venus. The middle volume strategically opens up towards the path Venus follows at night.



Fig 116. Light study model.

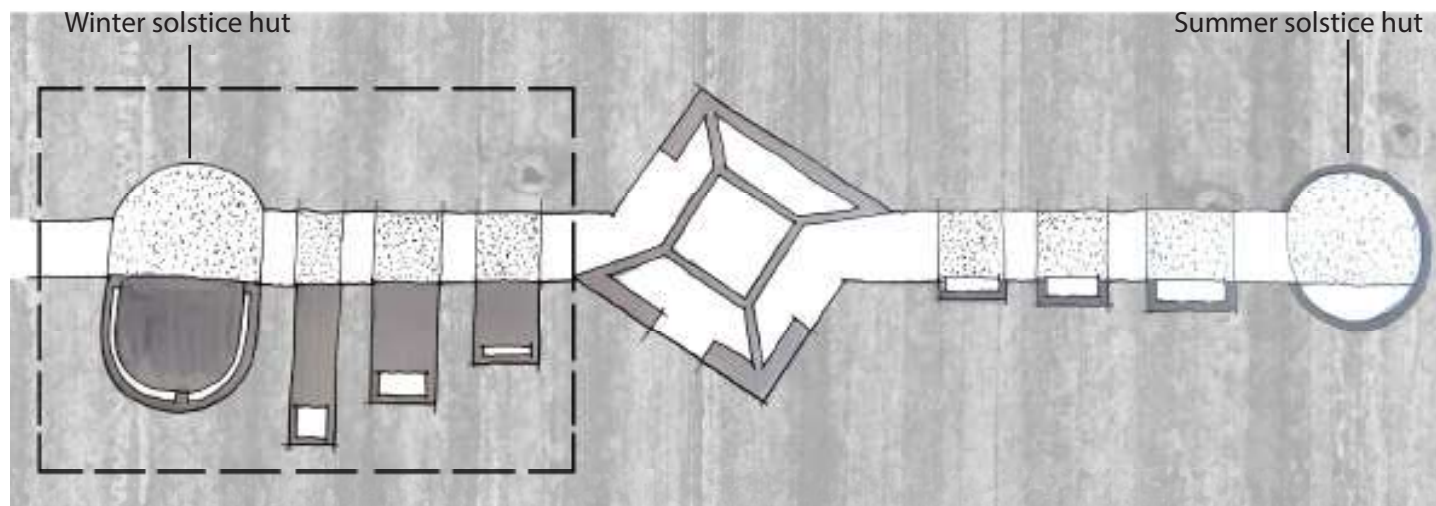


Fig 117. Key indicating the location where the light study is done.

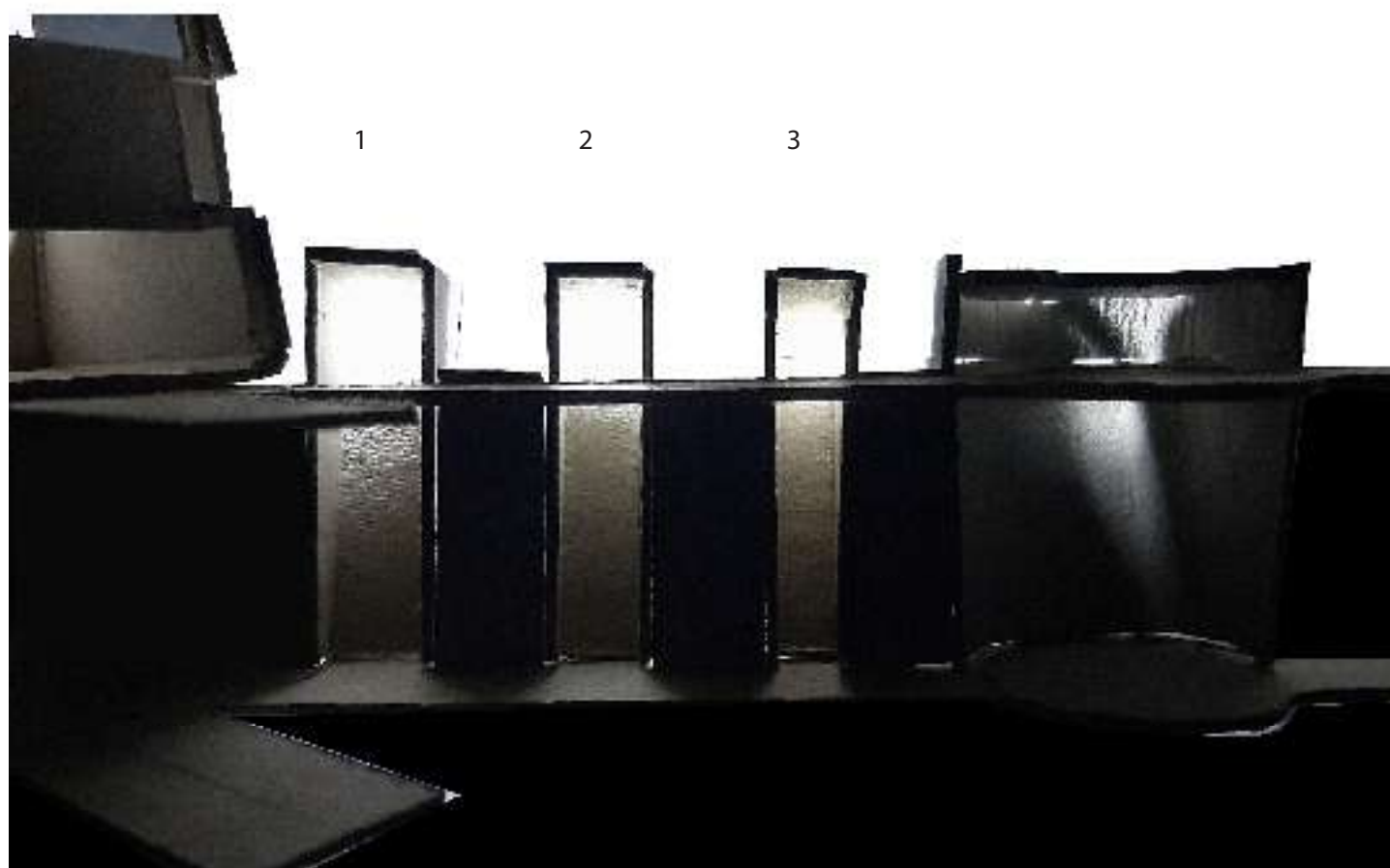


Fig 118. Light study model indicating the light quality during the summer solstice.

During the summer solstice which occurs at approximately 21 December in the southern hemisphere, the sun, as seen from earth, reaches its highest angle of between 83 and 90 degrees. The path to the winter solstice, as depicted in the above image, allows only a small amount of sunlight to enter at the top of the structure. This symbolizes that the sun is furthest away from its destination of the winter solstice, hence the space is dark with only a glimmer of sunlight seen at the top of the shaft. As the sun moves from the summer to the winter solstice, the direct sunlight will move more closely to the viewer who is standing in the shaft.

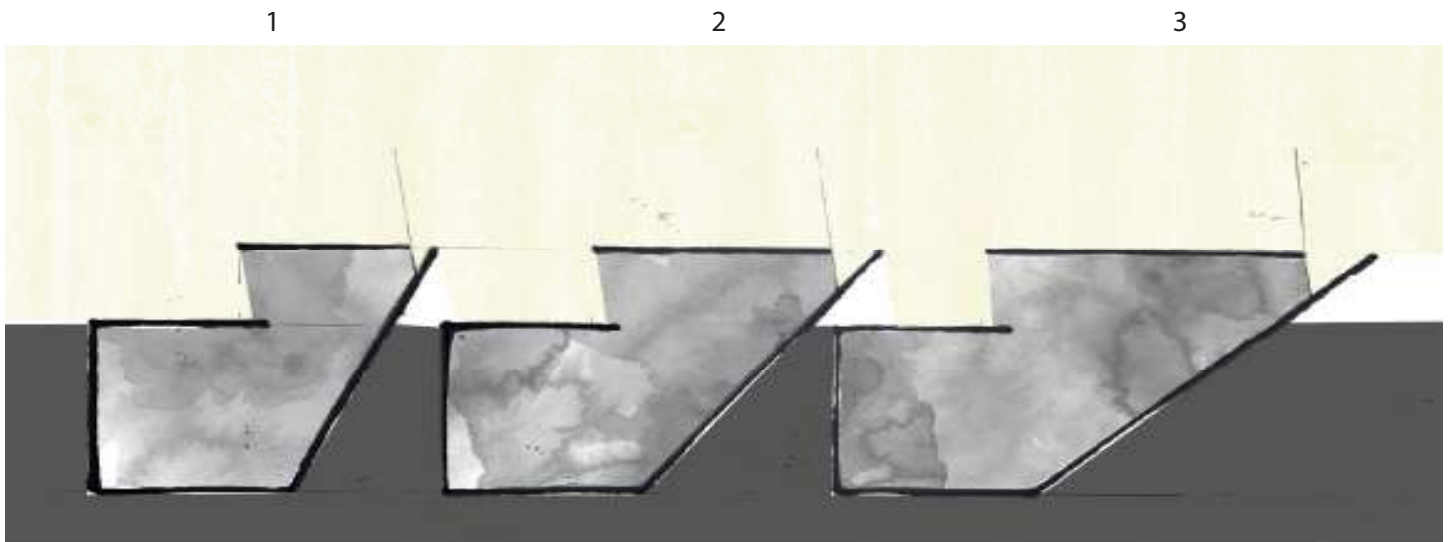


Fig 119. Diagrammatic section through each volume illustrating how light is experienced during the summer solstice.

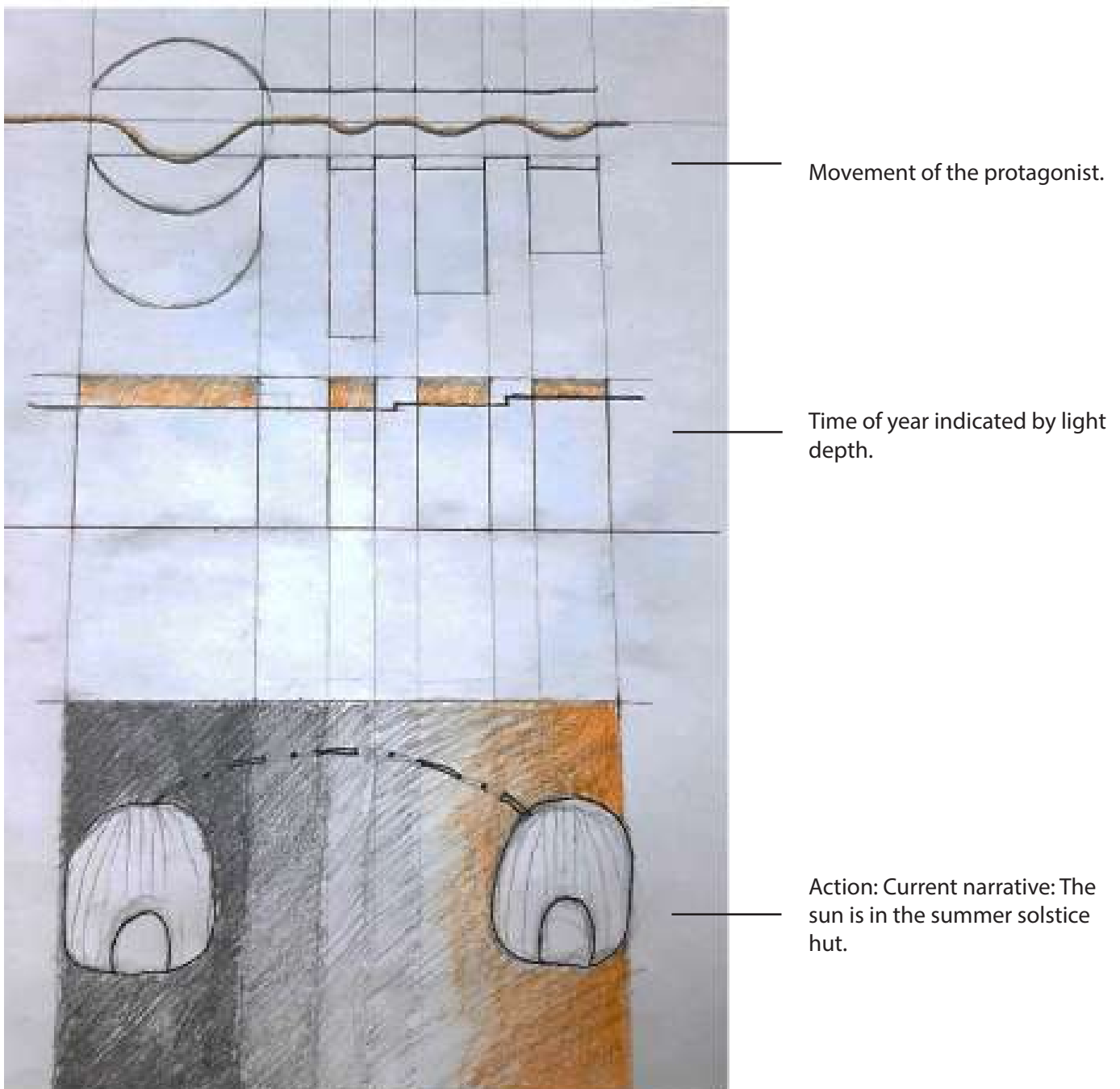


Fig 120. Notation drawing of the Sun-narratoscope.

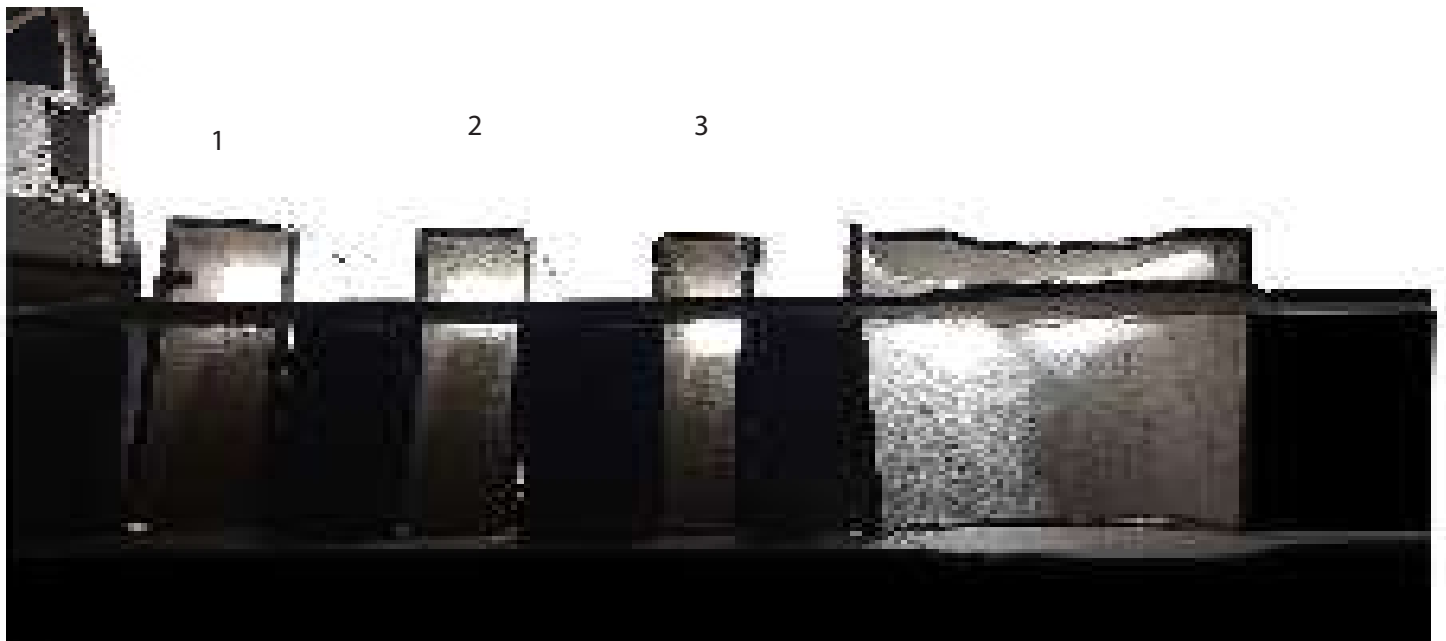


Fig 121. Light study model indicating light quality during the autumn equinox.

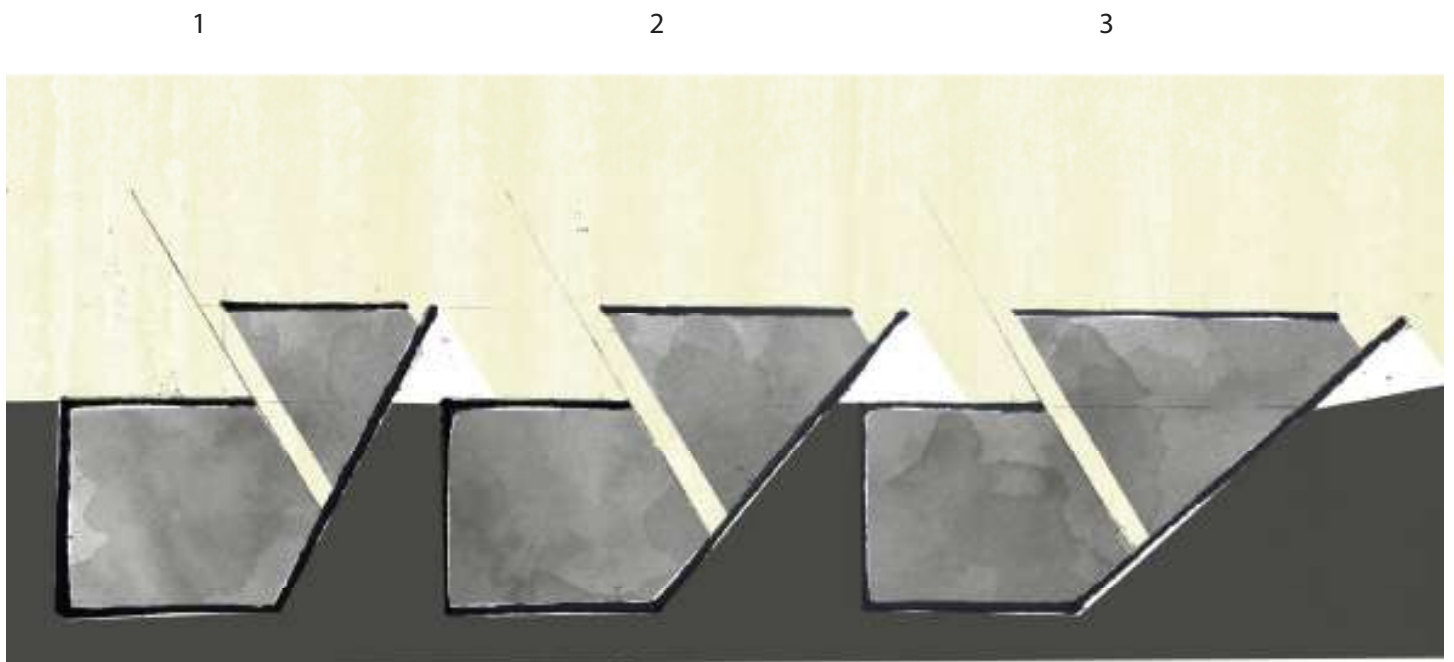


Fig 122. Diagrammatic section through each volume, illustrating how light is experienced during the equinox.

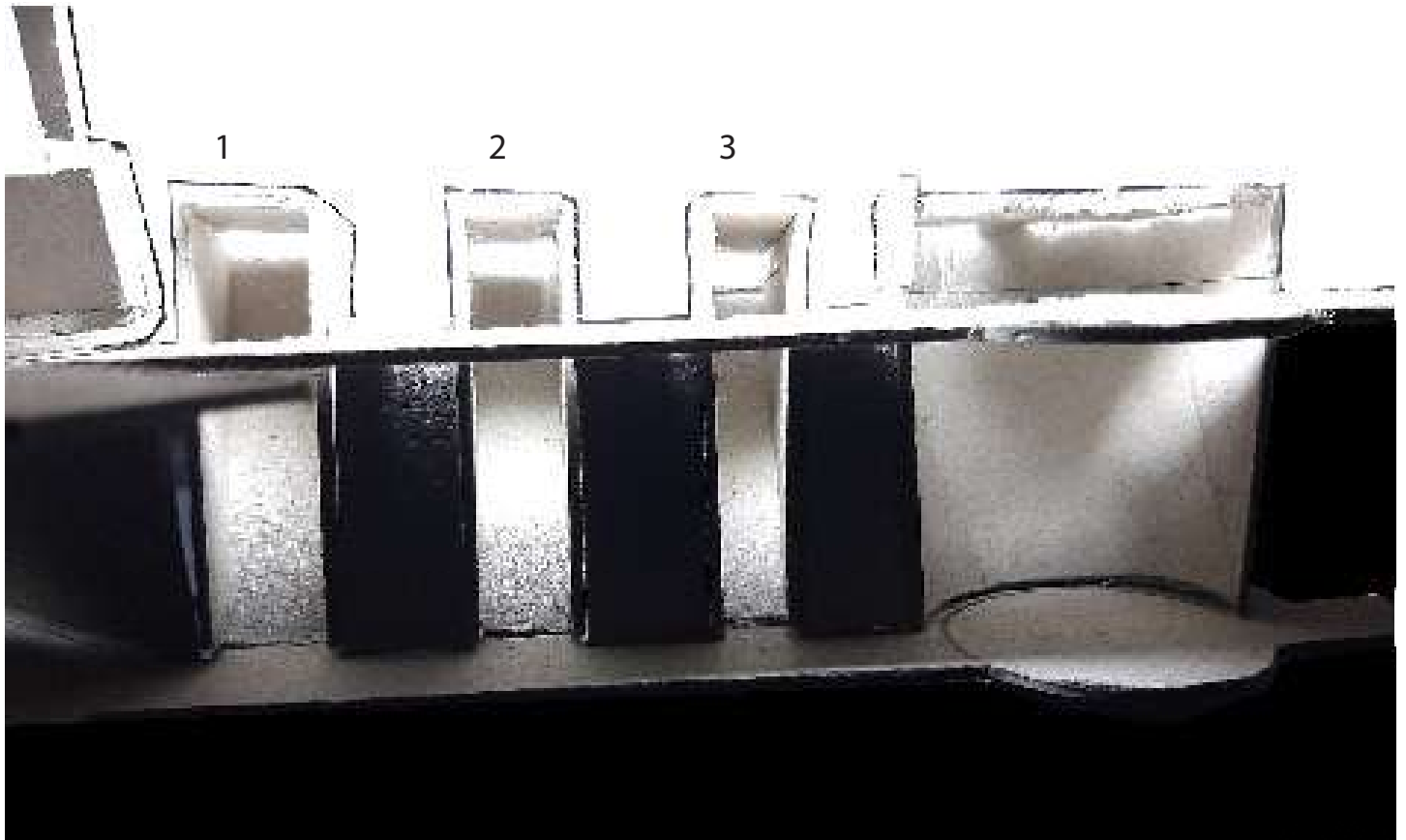


Fig 123. Light study model indicating light quality during the winter solstice.

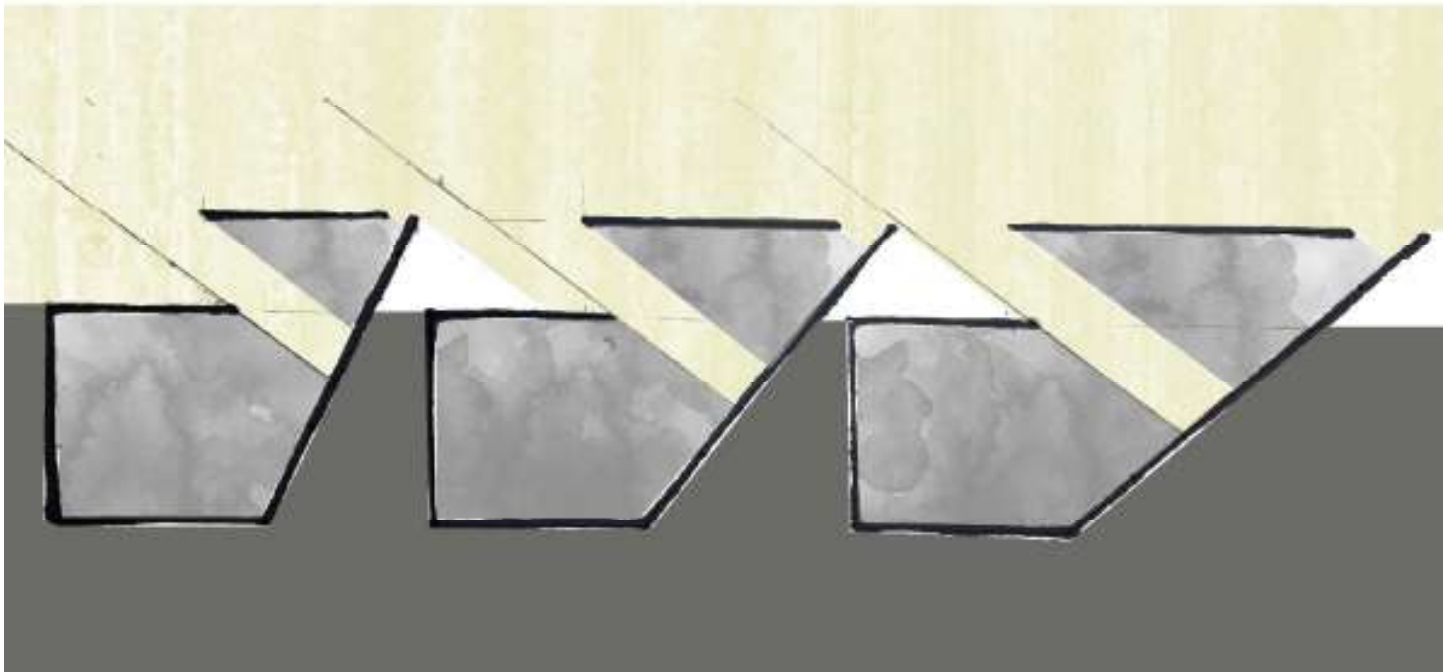


Fig 124. Diagrammatic section through each volume illustrating how light is experienced during the winter solstice.

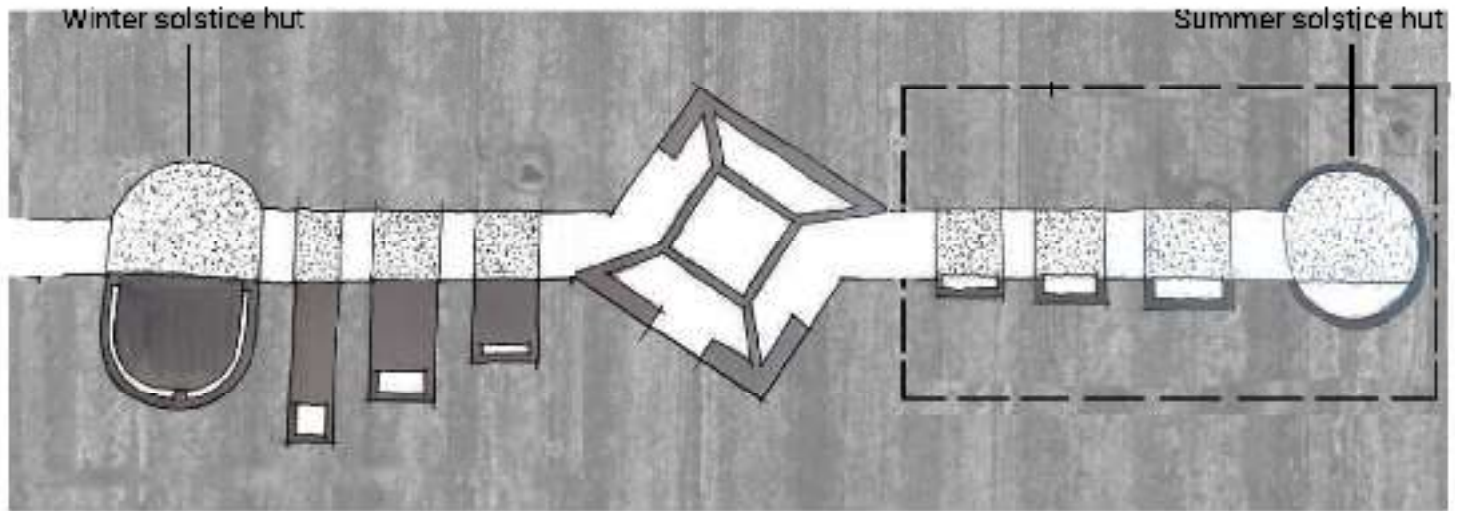


Fig. 125. Key indicating the location where the light study is done.



Fig 126. Light study model indicating light quality during the summer solstice.



Fig 127. Light study model indicating light quality during equinox



Fig 128. Light study model indicating light quality during the summer solstice

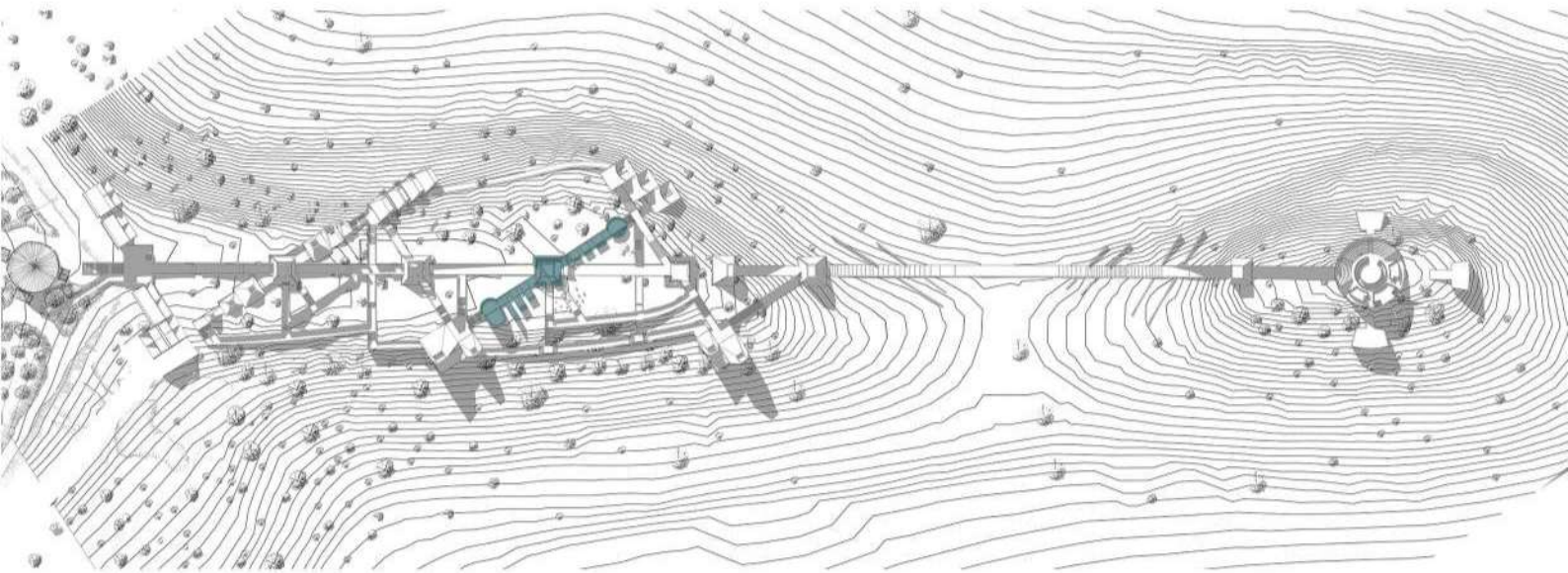
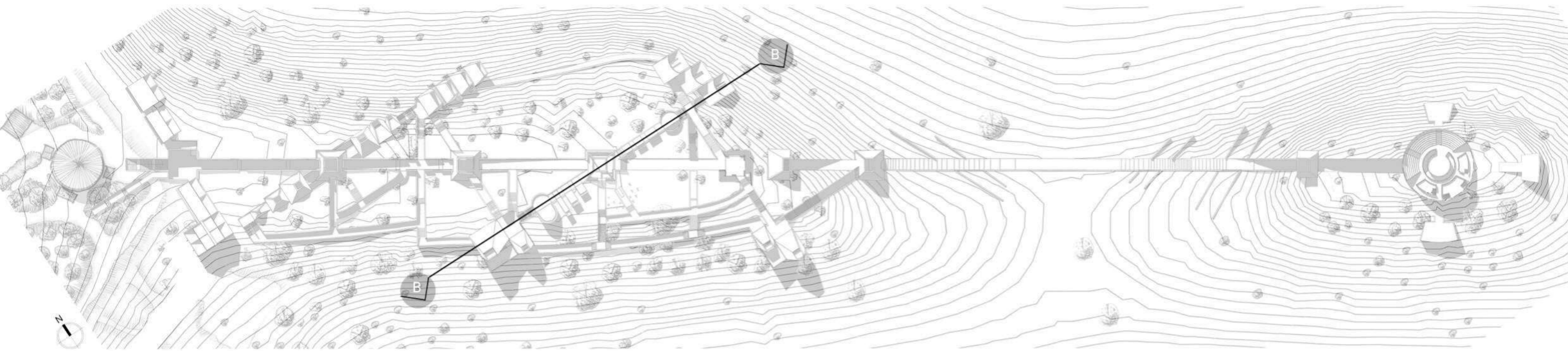


Fig 129. Key indicating the location of the sun exhibition.



SECTION B-B. THE SUN NARRATOSCOPE



Fig 130. Sun narratroscope on ground level.



Fig 131. Sun narratoscope on basement level.

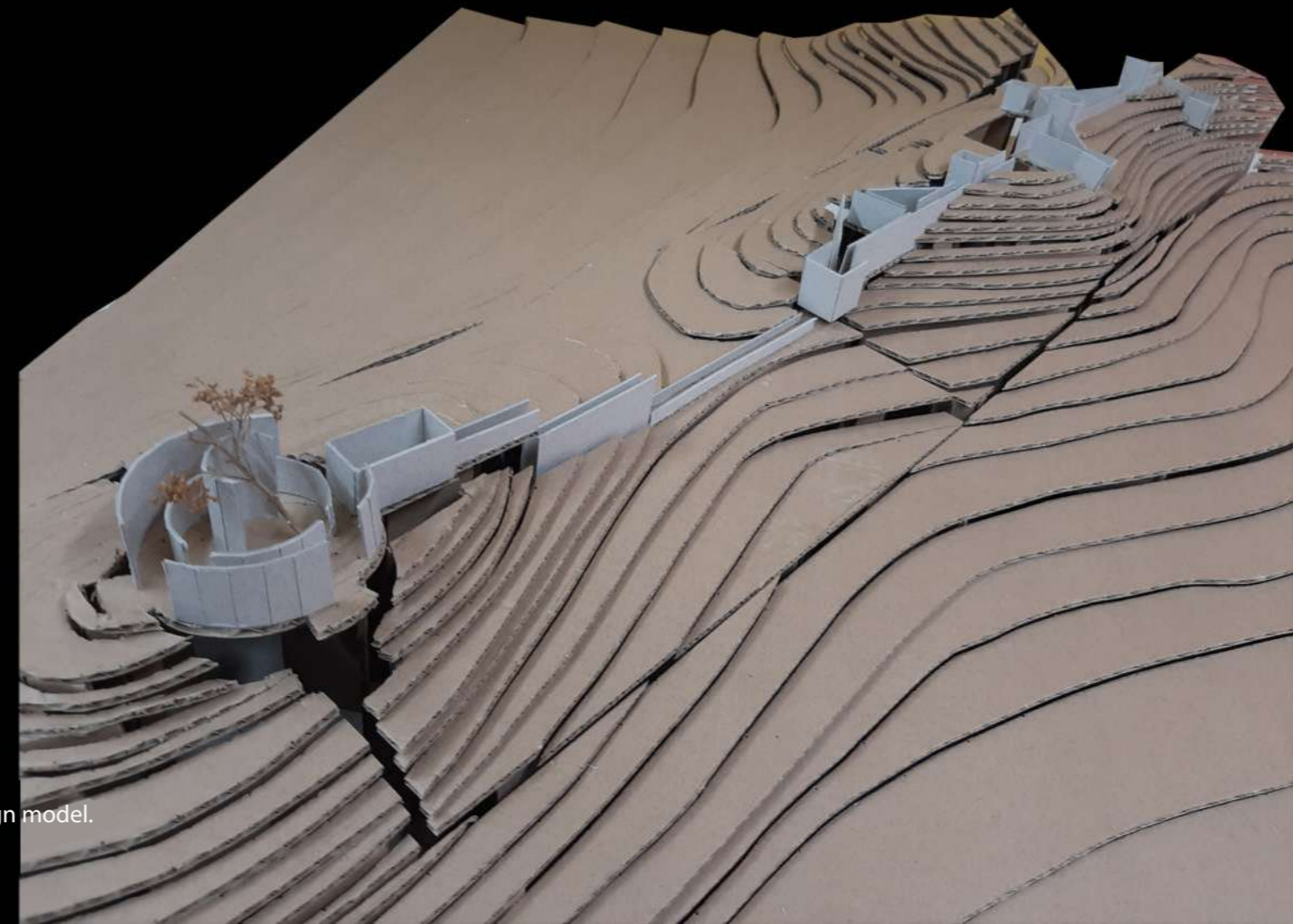
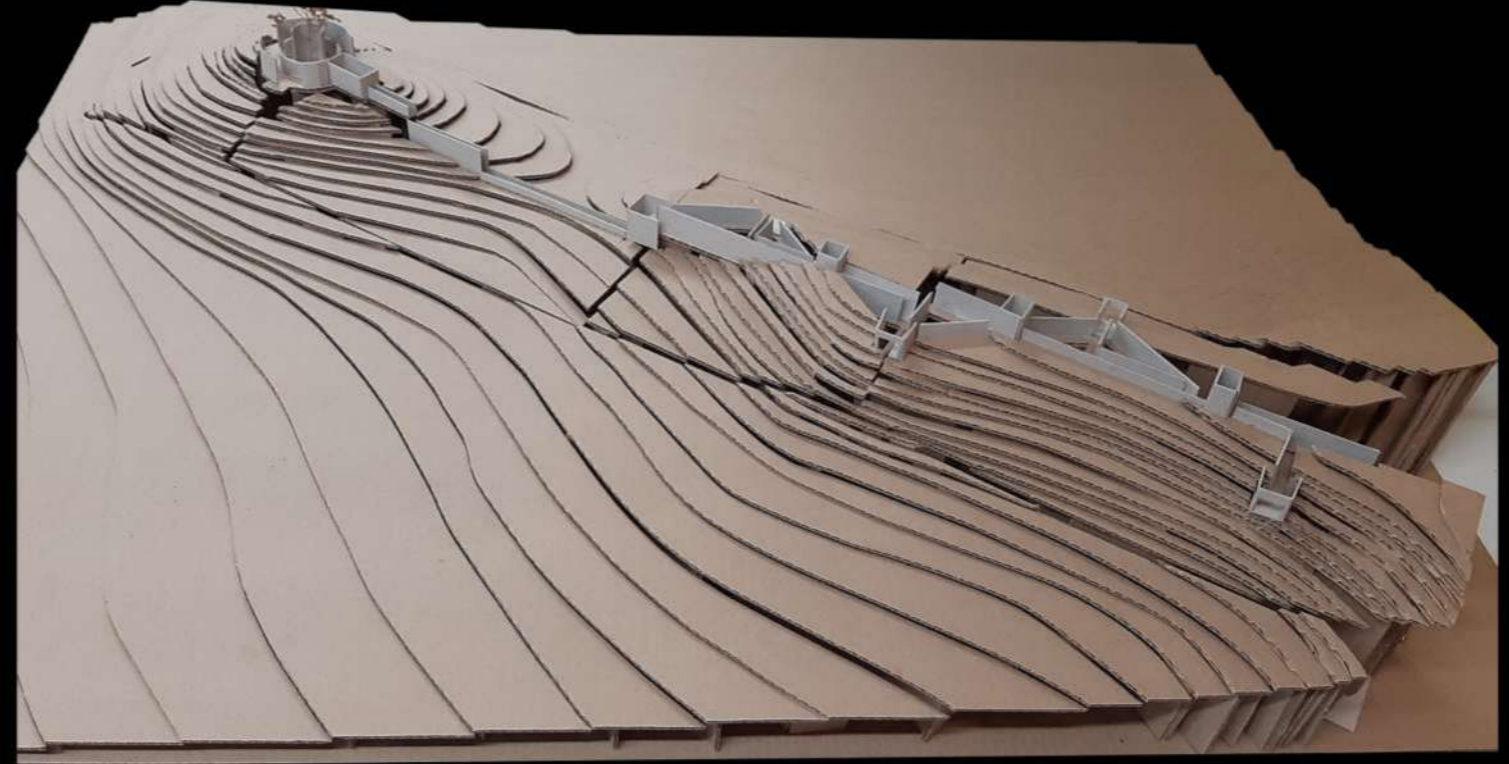
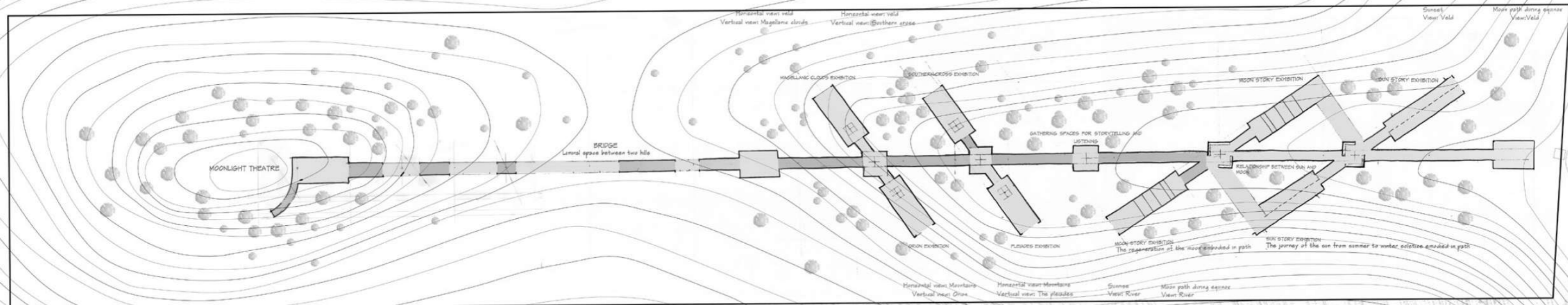
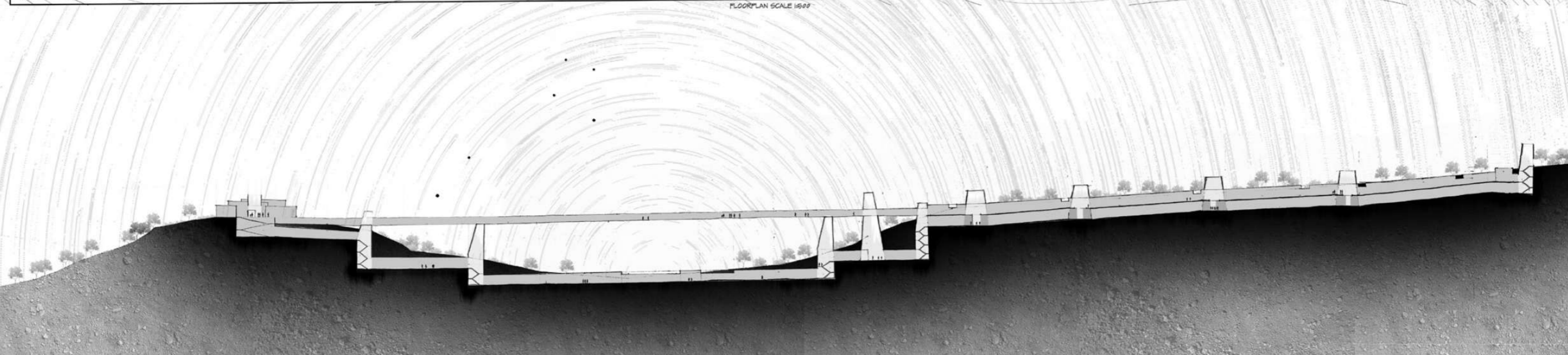


Fig 132. First design model.
90

THE ROUTE AS A NARRATIVE



FLOORPLAN SCALE 1:500



SECTION SCALE 1:500

THE SLEEPING SUN'S ARMPIT-KABBO
 so the sun came and by law
 he lifted his elbow
 he armpit shone upon the ground
 and then the children threw him into the sky
 the children were those who approached gently
 to lift up the sun's elbow while the sun lay sleeping
 to throw up the sun's armpit that might dry the bushman's nose
 so that all the places could become light and filled with heat
 and the sun comes and the darkness goes away
 the sun comes, the sun sets
 the darkness comes, the moon comes
 the day breaks, the sun comes out
 the darkness goes away, the sun comes out
 the sun sets
 the moon comes out, the moon lightens the darkness
 the darkness disappears, the moon comes out
 the moon shines, taking away the darkness
 the moon comes out and brightens the darkness
 the sun drives the moon away, the sun presses it
 the moon wastes away and says 'oh sun, leave for the children
 my bushkone', the sun leaves the bushkone for the children
 in pain the moon shrinks, in pain he returns home
 in pain he goes to become another moon
 he becomes a moon which is whole
 and he again he lives; he again, he lives
 who he feels he has seemed to die
 he becomes a new moon, he feels how he grows he feels he has again grown a stomach therefore he is large he comes while he is
 alive he feels he is the moon that goes by night he feels he is a shoe that walks the night
 (Krog 2004:40)

SIRIUS AND CANOPUS-HANKASS'O
 the-one-that-shimmers
 (my stepmother says when food is abundant)
 winks
 like the-one-that-shines
 the-one-that-shines
 winks
 like the-one-that-shimmers
 the-one-that-shines
 winks
 like the one that like the-one-that-shimmers
 like-the-one-that-shimmers
 winks
 like the-one-that-shines
 (Krog 2004:34)

THE MILKY WAY AND THE STARS-KABBO
 the wood ashes that lie here must become the milk way
 they must lie along the sky
 that there are stars that stand outside of the milk way
 while the milk way remains the milk way
 the milk way must go round with the stars
 while the stars sail along
 they sail along on their footprints
 which they sail along are following
 the sky lies still
 the stars have turned around
 the stars are those which go along
 while they feel that they sail along on their footprints
 the stars become white when the sun comes out
 the stars were red when the darkness comes out
 people go by night when the ground is made light
 when the milk way gently glows
 the milk way must white lie along the sky
 while it feels that it is wood ashes
 the earth would not have been so light
 had not the milk way been the milk way, it and the stars
 (Krog 2004:34)

THE MOON- VENUS RISING
MOON ASSOCIATION WITH VELD SHOE AND RED DUST-LANDSCAPE
 Heaviti was of the opinion that Kaggen created the new moon which was arch shaped like a curling veld shoe or a feather. The red dust refers to the common red sands of the Kalahari and southern arid areas
 The moon is red in colour because the shoe is covered in red dust
 (Alcock 2014:105)
MOON ASSOCIATION WITH REGENERATION
 The sun is angry at the ability of the moon to regenerate itself, to look like the sun at full moon and to give out light even in a waning state. The sun dies to its anger attacks the moon although the sun takes pity on the moon at one time, so already indicated
 The moon at the stage still emits some light with the permission of the sun and for the sake of its children. The light indicates that the moon will return to full life
 The full moon being attacked, is red in colour which signifies blood
 (Alcock 2014:105)
THE MOON ASSOCIATION WITH WATER
 The O King like the Naron and Aen, perceived the New Moon to be the giver of rain, and which was prayed to as such
 (Alcock 2014:105)

DONT LOOK AT THE MOON- DIAKWAN
 lower your head when you shoot an animal
 dont look up
 dont look how the moon shines farth
 if you do look at the moon
 predators will devour the animal you have killed
 if the animal is not quite dead
 the water of the moon will bring it back to life
 our mothers have told us all about it
 the water of the moon there yonder
 there on the bushes it lies like liquid honey
 if the water splashes on the animal it'll get up
 it'll bear no mark of a poison arrow
 the water of the moon will have healed it
 and it will live
 on account of it
 (Krog 2004:105)

Fig 133. Design development: Axonometric drawing (Second version).

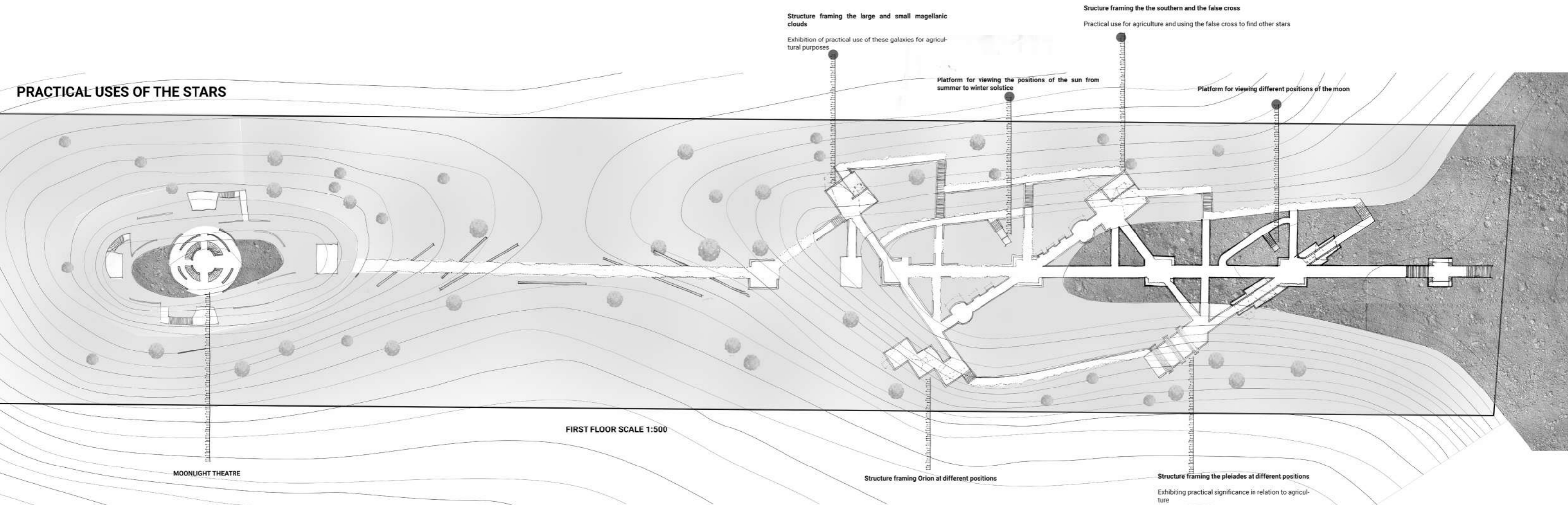
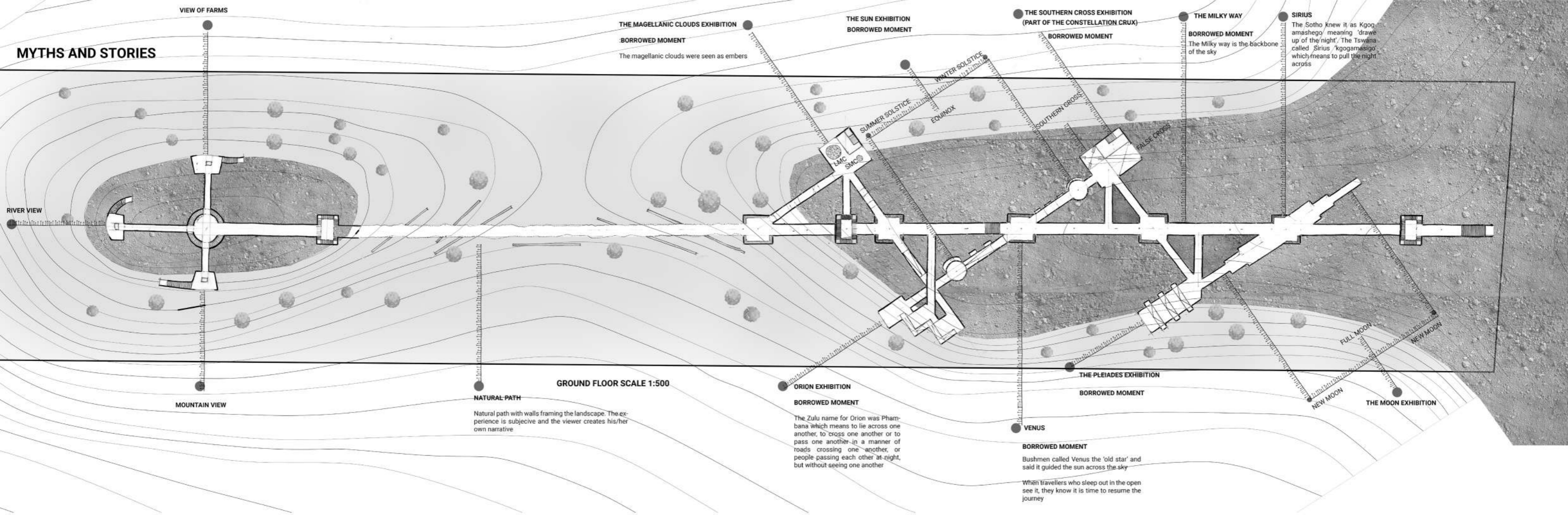


Fig 134. Design developmet: Plan (Third version).

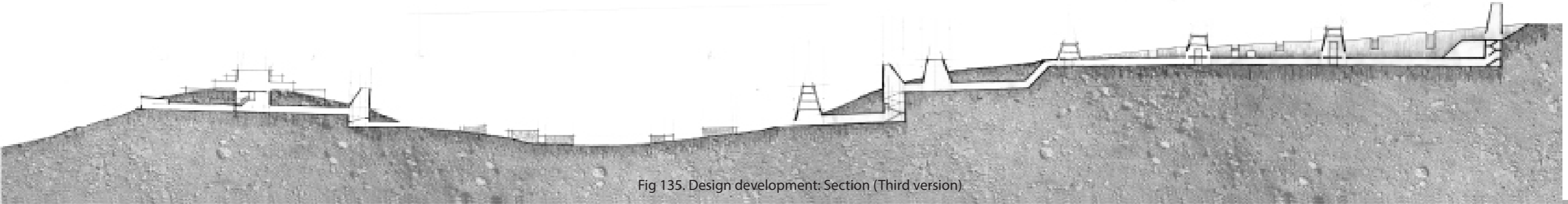


Fig 135. Design development: Section (Third version)

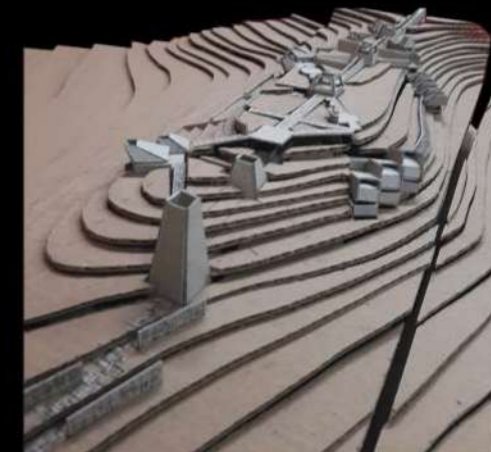
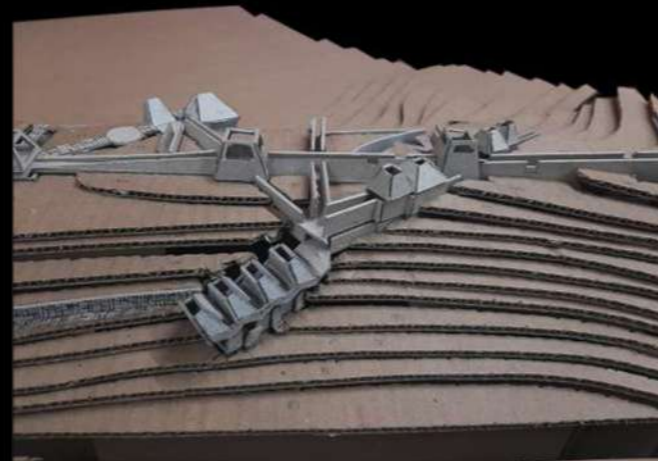
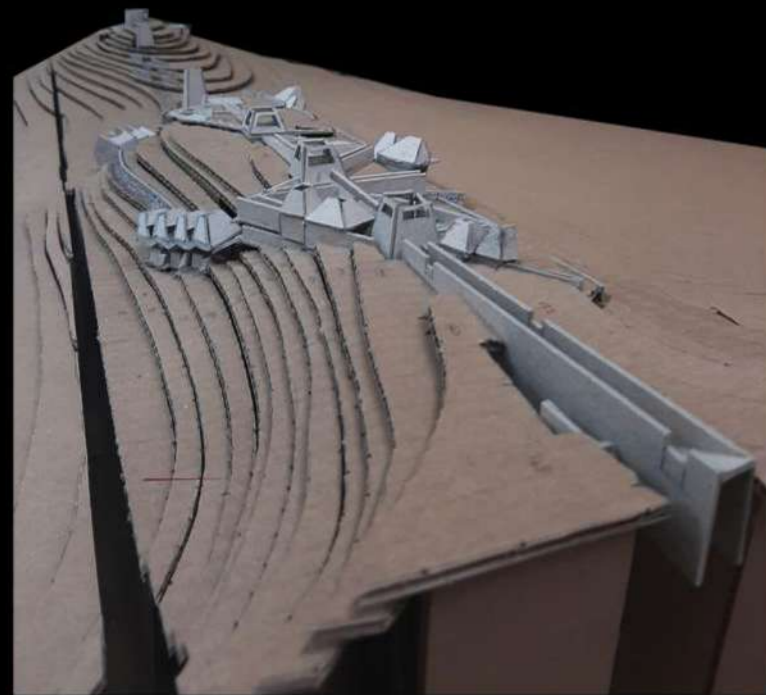
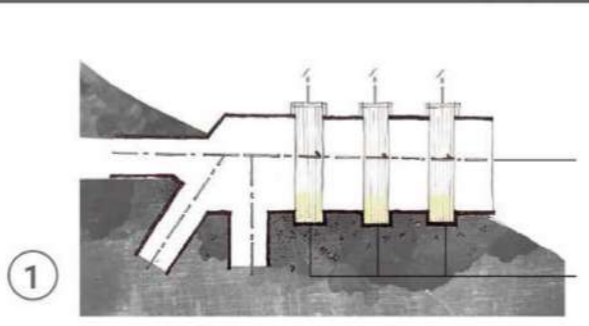
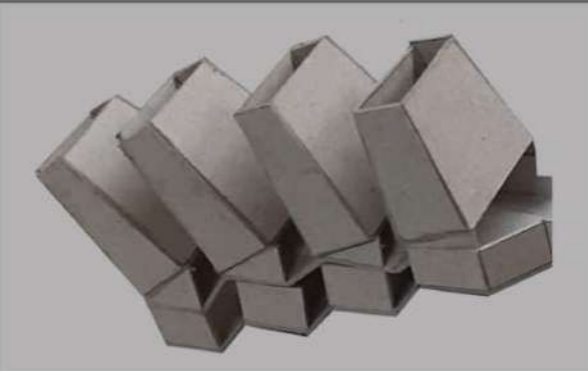
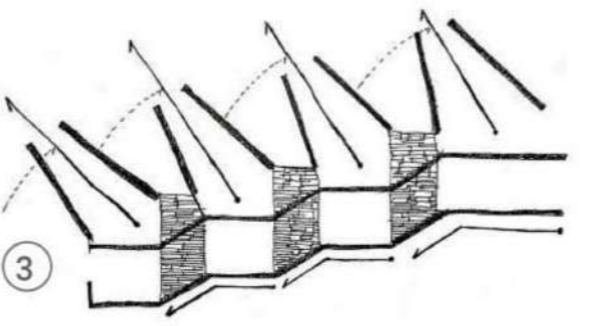


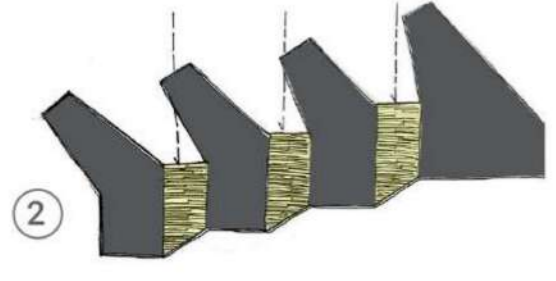
Fig 136. Design development: Model (Third version) model.



1 FLOORPLAN
indicating areas that are lit up by the sun and placement of feature walls

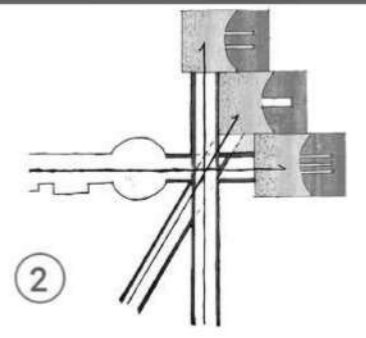
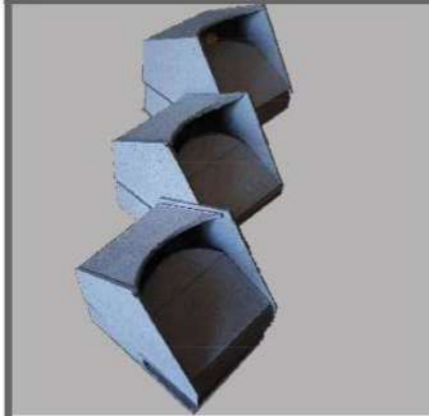


2 SECTION
Indicating placement of light shafts

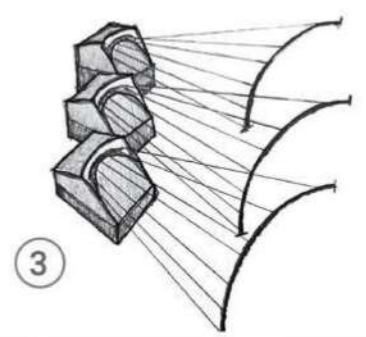


3 SECTION
Indicating the framing of the pleiades at different angles

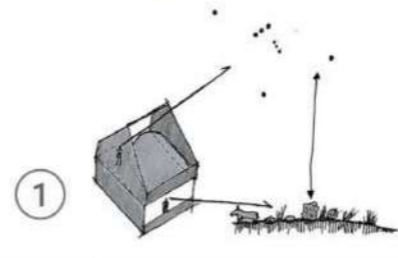
PLEIADES NARRATOSCOPE



1 DIAGRAM
Indicating the framing of the landscape on lower level and framing of Orion on the top level



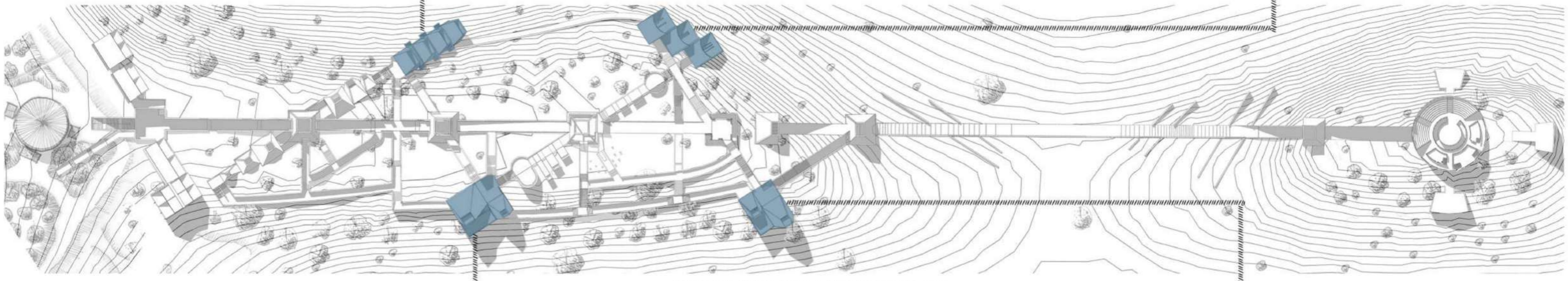
2 FLOORPLAN
Indicating the narrative of crossing paths and the placement of three symbolic volumes



3 DIAGRAM
Indicating the framing of Orion through roof

ORION NARRATOSCOPE

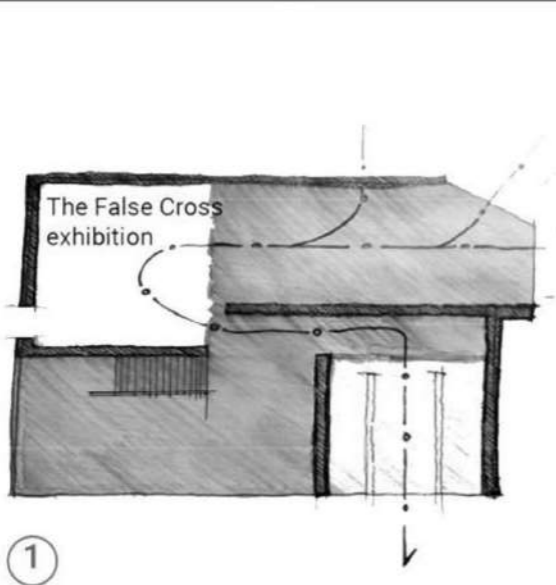
SPATIAL



INTERPRETATIONS

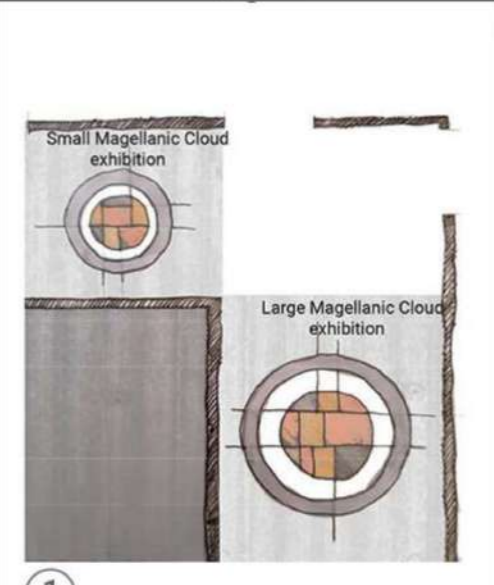
SOUTHERN- AND FALSE CROSS NARRATOSCOPE

MAGELLANIC CLOUD NARRATOSCOPE

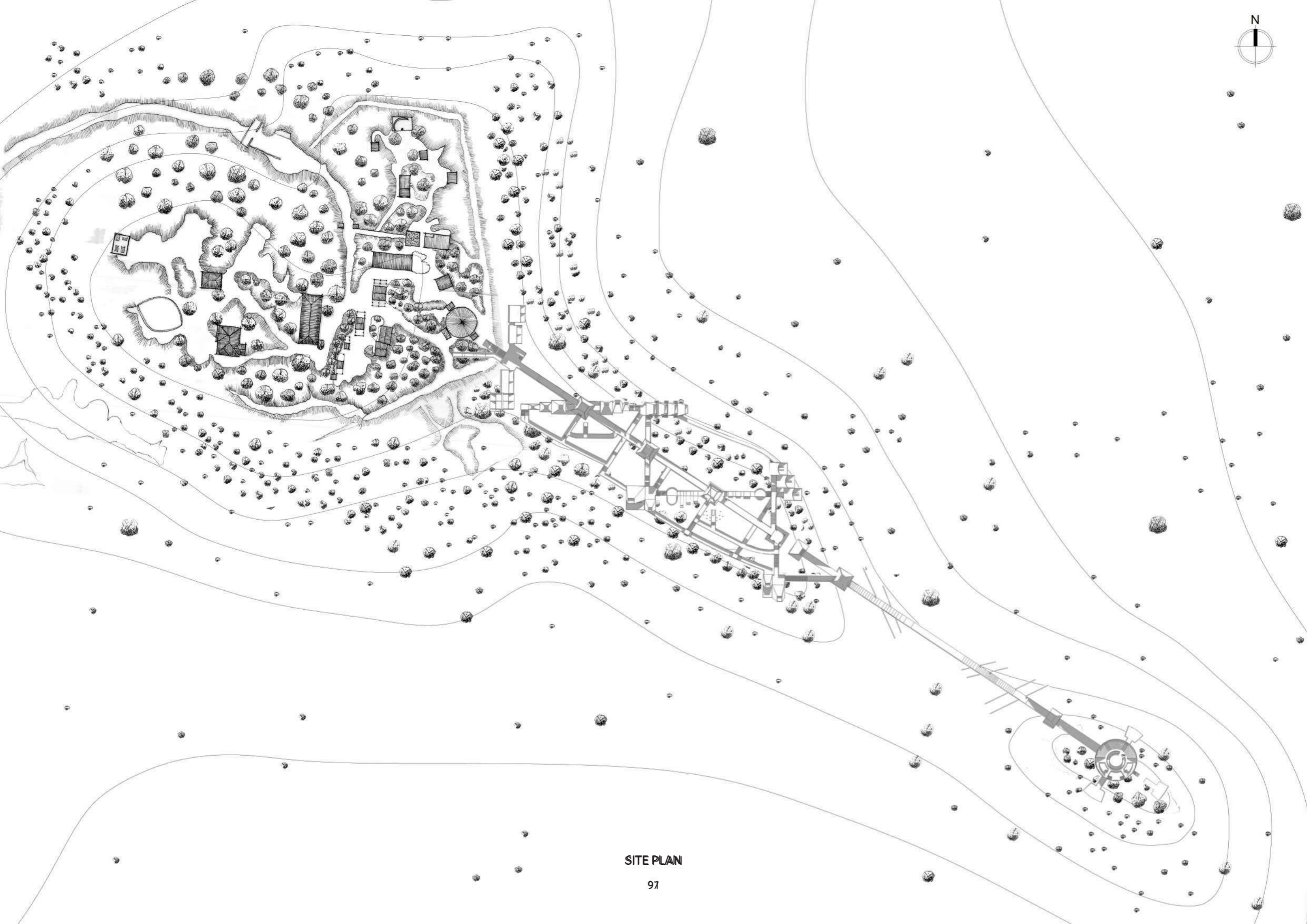


1 LAYOUT DIAGRAM
Indicating the narrative of the false cross and the southern cross.

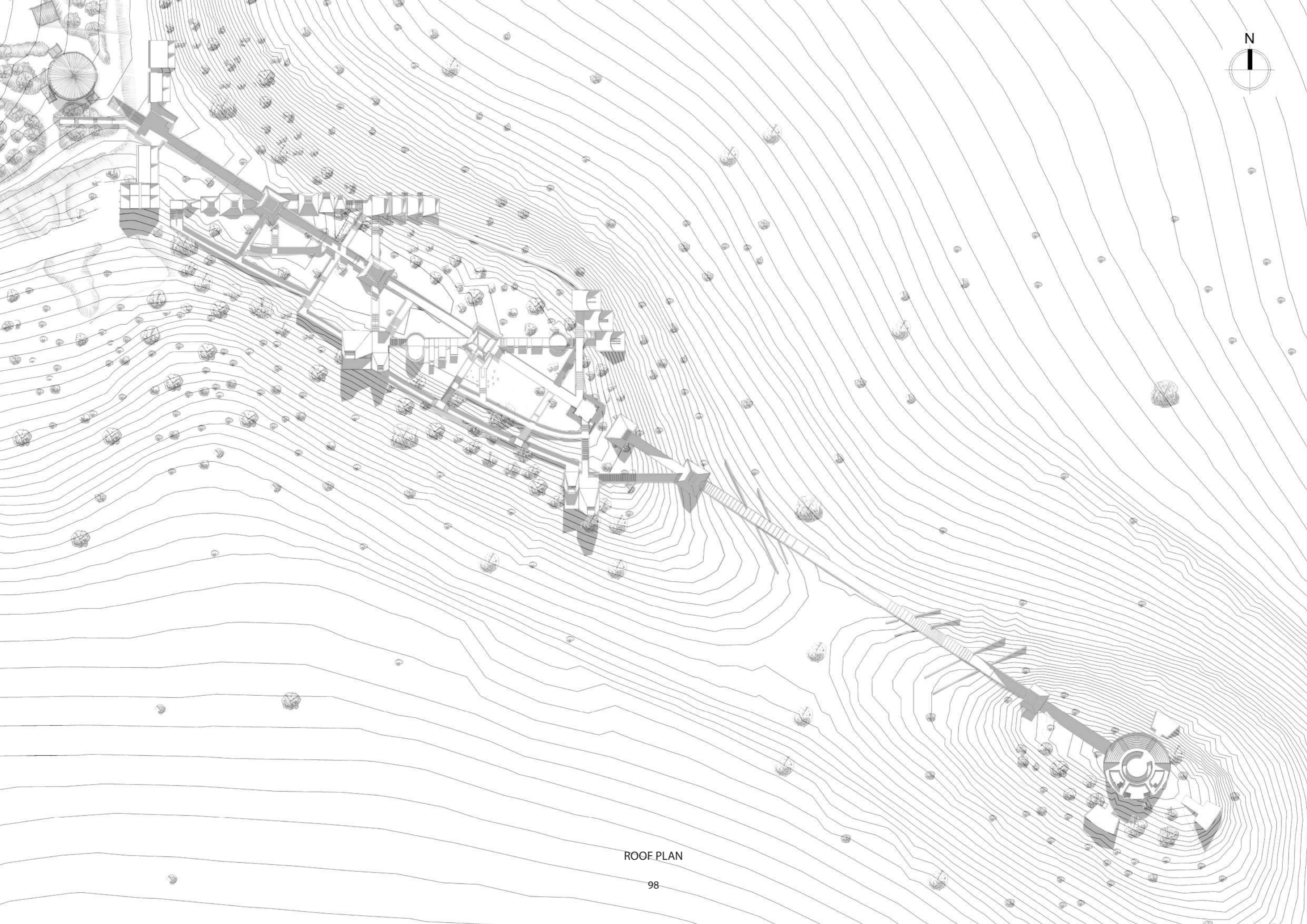
The visitor is first misguided in the direction of the false cross and eventually reaches the exhibition of the Southern Cross



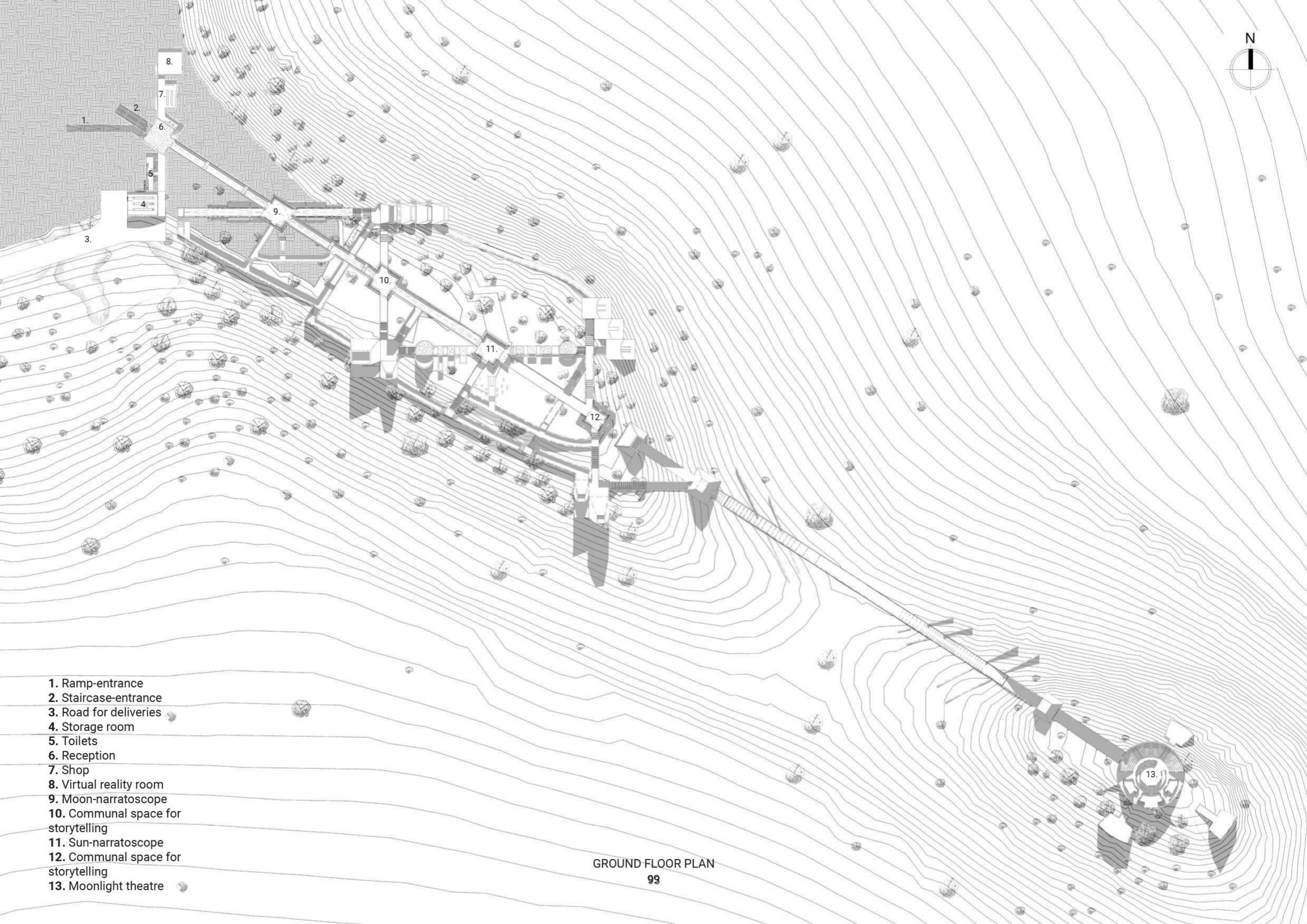
1 LAYOUT DIAGRAM
The magellanic cloud exhibition is organized around two circular elements that represent embers of a fire.



SITE PLAN

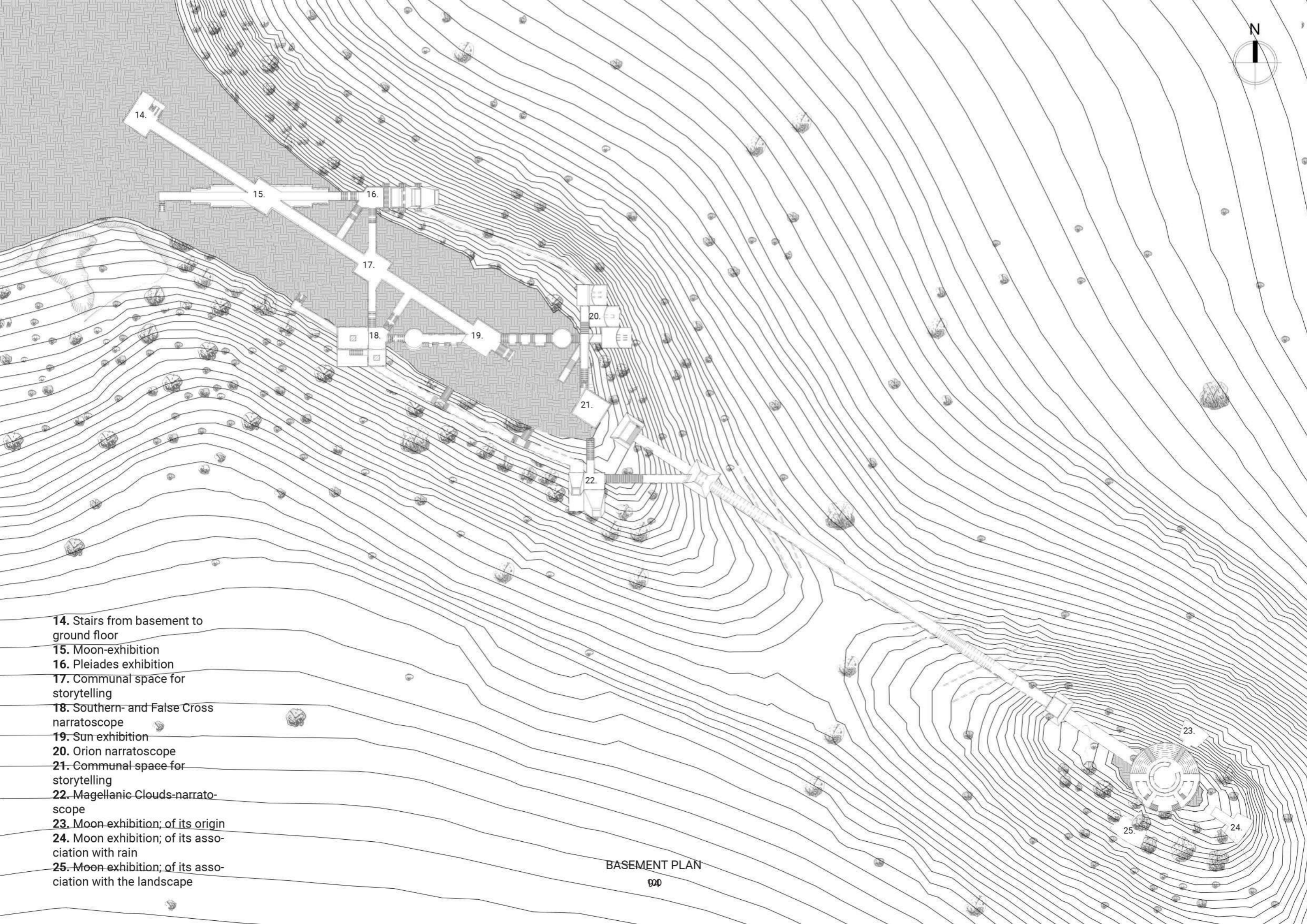


ROOF PLAN



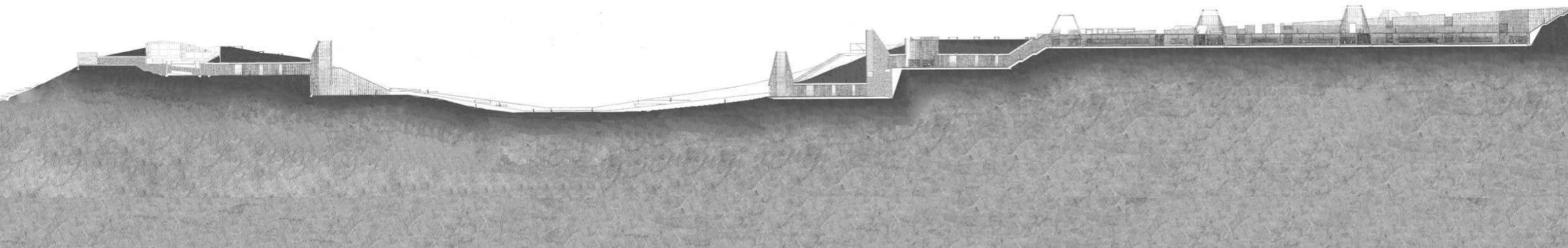
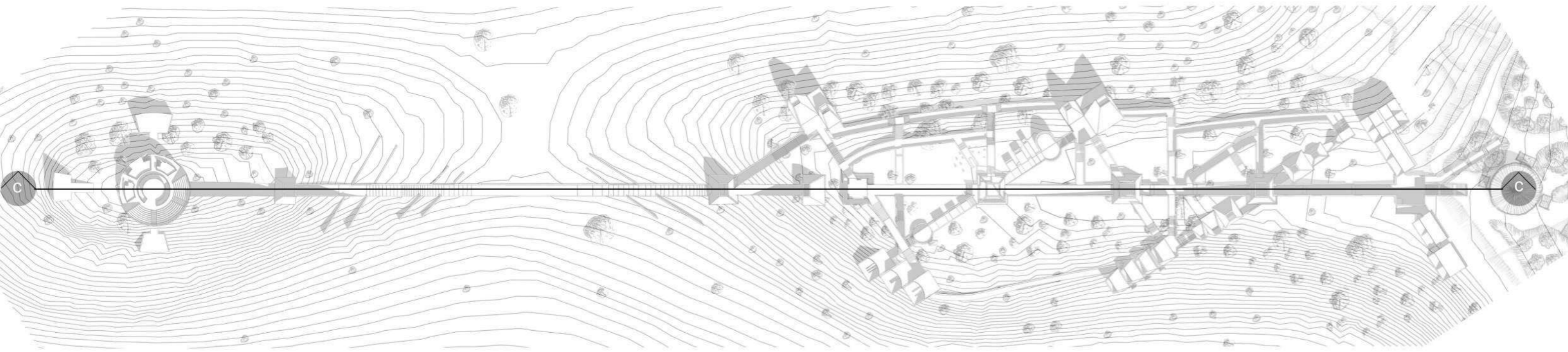
- 1. Ramp-entrance
- 2. Staircase-entrance
- 3. Road for deliveries
- 4. Storage room
- 5. Toilets
- 6. Reception
- 7. Shop
- 8. Virtual reality room
- 9. Moon-narratoscope
- 10. Communal space for storytelling
- 11. Sun-narratoscope
- 12. Communal space for storytelling
- 13. Moonlight theatre

GROUND FLOOR PLAN



- 14. Stairs from basement to ground floor
- 15. Moon-exhibition
- 16. Pleiades exhibition
- 17. Communal space for storytelling
- 18. Southern- and False Cross narratoscope
- 19. Sun exhibition
- 20. Orion narratoscope
- 21. Communal space for storytelling
- 22. Magellanic Clouds-narratoscope
- 23. Moon exhibition; of its origin
- 24. Moon exhibition; of its association with rain
- 25. Moon exhibition; of its association with the landscape

BASEMENT PLAN
000



SECTION C-C



Fig 137. View of the narratoscope.

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