[PART THREE]

CHAPTER

06

This Chapter presents the theoretical, functional and formal precedents used to inform design development.

REFUGE

The state of being safe or sheltered from pursuit, danger, or difficulty.

a Place or situation providing safety or shelter.

synonyms: shelter, protection, safety, security, asylum, sanctuary
(Oxford English Dictionary)

Figure 82: " The Dome" in its Sonoran Desert landscape. (Shulman 1985)

6.1 THE THEORY OF PROSPECT AND REFUGE

In the investigation into different landscape configurations that incite different experiential responses, Jay Appleton's work aims to bridge a gap between theoretical aesthetics and practical analysis of landscapes (artistic and scientific). By referencing the work of American philosopher John Dewey in *Experience and Nature* (1929), Appleton is able to argue that the aesthetic behaviour of a human being has emerged out of an evolutionary process and that this alone suffices to explain that 'our' preference in landscape lies in biological conditioning.

Two theories of the above mentioned conditioning emerge and it is in these theories that the dissertation relates to human behaviour and built landscapes. The theories are briefly described to contextualise the relationship between man and his environment.

6.1.1. Habitat theory

Habitat theory *asserts that the relationship between the human observer and the perceived environment is basically the same as the relationship of a creature to its habitat. It asserts further that the satisfaction which we derive from the contemplation of this environment, and which we call 'aesthetic', arises from a spontaneous reaction to that environment as a habitat, that is to say as a place which affords the opportunity for achieving our simple biological needs (Appleton 1993:63).*

In layman's terms this theory is about a place's ability to satisfy every biological need of a human being (eat, sleep, etc.).

6.1.2. Prospect-refuge theory

Prospect-refuge theory postulates that, because the ability to see without being seen is an intermediate step in the satisfaction of biological needs, the capacity of an environment to ensure the achievement of both prospect and refuge, becomes a more immediate aesthetic satisfaction (Appleton 1993:66).

The ability to see and the ability to hide are important for a human being to calculate the effectiveness of survival. In the desire to satisfy all our biological needs, the ability to see without being seen is not an opposite theory to the former. Rather, these theories are embedded in one another to experience an environment of comfort and safety.
Ultimately a level of aesthetic satisfaction and acceptance should occur in a specific environment to catalyse responses of relief and comfort. Therefore a landscape (natural or built) only needs to have the appearance of satisfying the needs of survival.

In conclusion, an optimal environmental condition of shelter comprises of different parts. The most important factor in the search of such an environment is survival instinct determined by a biological drive in human beings.

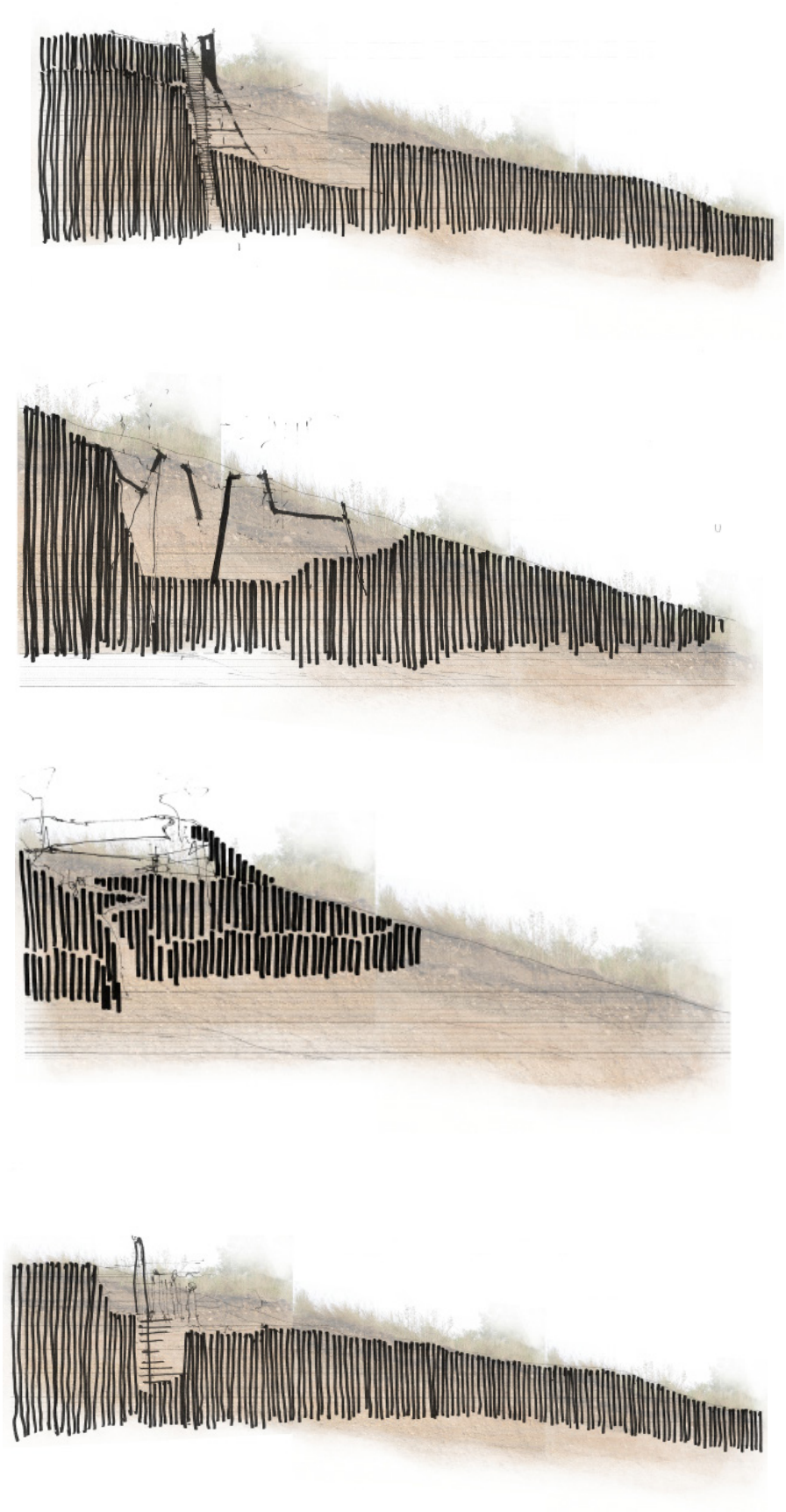

Figure 83: Sectional drawings of the interpretation of prospect and refuge in different scenarios. (2016)

6.2
CASE STUDY 1

THE COROMANDEL ESTATE MANOR HOUSE

6.2.1. FORMAL ASPECTS

As part of a formal study the building as a ruin or object in the landscape is considered.

This aspect is illustrated in the start of the journey towards the house, with a winding driveway and natural vegetation revealing and concealing the stone walls embedded in the landscape. The approach and movement within the plan layout is conceptually derived from the qualities on an italian town with narrow streets leading to private interior spaces. The intimate effect of moving through a narrow street is enhanced by texture and use of materials. Through narrow 'paths' sheltered by thermal mass the building responds to the South African climate and typical farm heat and glare. The structure provides cooling and greenery which allows for the incorporation of water in a sustainable manner.

As a structure it resembles a city of stone in the distance only revealing its delicate shaded streets as one wanders through and within in. Contrasting to its fortified nature the two sets of parallel wings extend towards landmarks in the rural landscape - extending into and receiving the veld.

The nature of the architecture provides a constant play between appearance of brutality and 'object'; and a delicate experience of threshold and movement which collaboratively creates a sculptured shelter within the landscape.

6.2.2. ENVIRONMENTAL ASPECTS

The environment and natural vegetation laid the foundation for the architectural palette. Structurally the building consists of a reinforced concrete frame covered with a green roof. Infill brickwork and cavity walls are tied together under this grass canopy while extending towards the landscape. The cavity walls are craftfully cladded with stonework.

The roof is covered with 700mm of soil and indigenous vegetation. The recreated habitats on the roof and between the corridoors and atria of the building, are planted with indigenous species from the immediate environment. This was done to the extent where the architecture recreates an endemic habitat for nature, making it difficult to distinguish which came first - the trees or the building. This is once more attributed to the ruin in the landscape where nature has appropriated the building as extension of the veld.

Figure 84: Photographs of Coromandel Manor house taken by author. (2016)

6.3
CASE STUDY 2

MALCOLM WELLS
ONION HOUSE

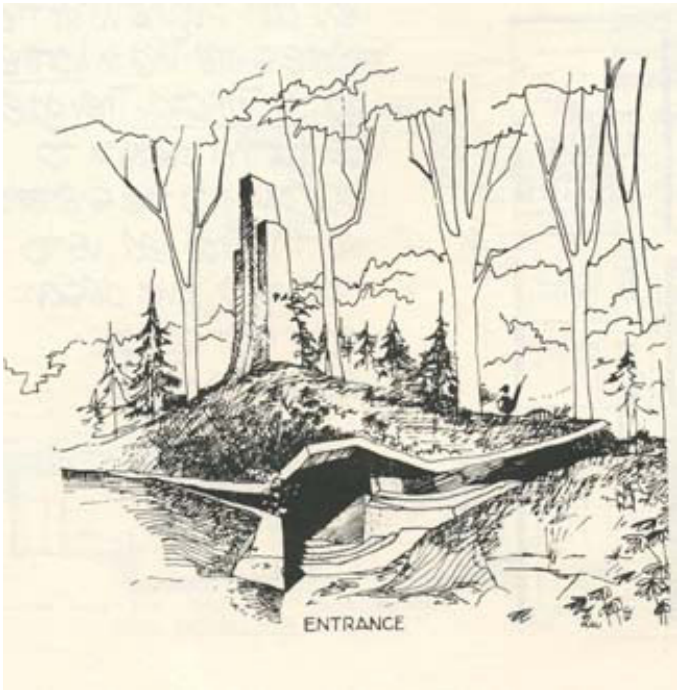

Figure 85: Sketch of 'Onion house' by Malcolm Wells. (Higginson 2006)

6.3.1. AN OVERVIEW

Malcolm Wells (1926-2009) known as an 'underground architect' was born in America.

Using nature as his major form generator he perceives the earth's surface as the habitats of plants and creatures other than humans. By using the earth's surface as part of building materials he achieves an energy conscious and responsive design. Wells did not only achieve an environmentally responsive design but used the form of his architecture (The Onion House) to shape the user's perception and interaction with nature through everyday dwelling.

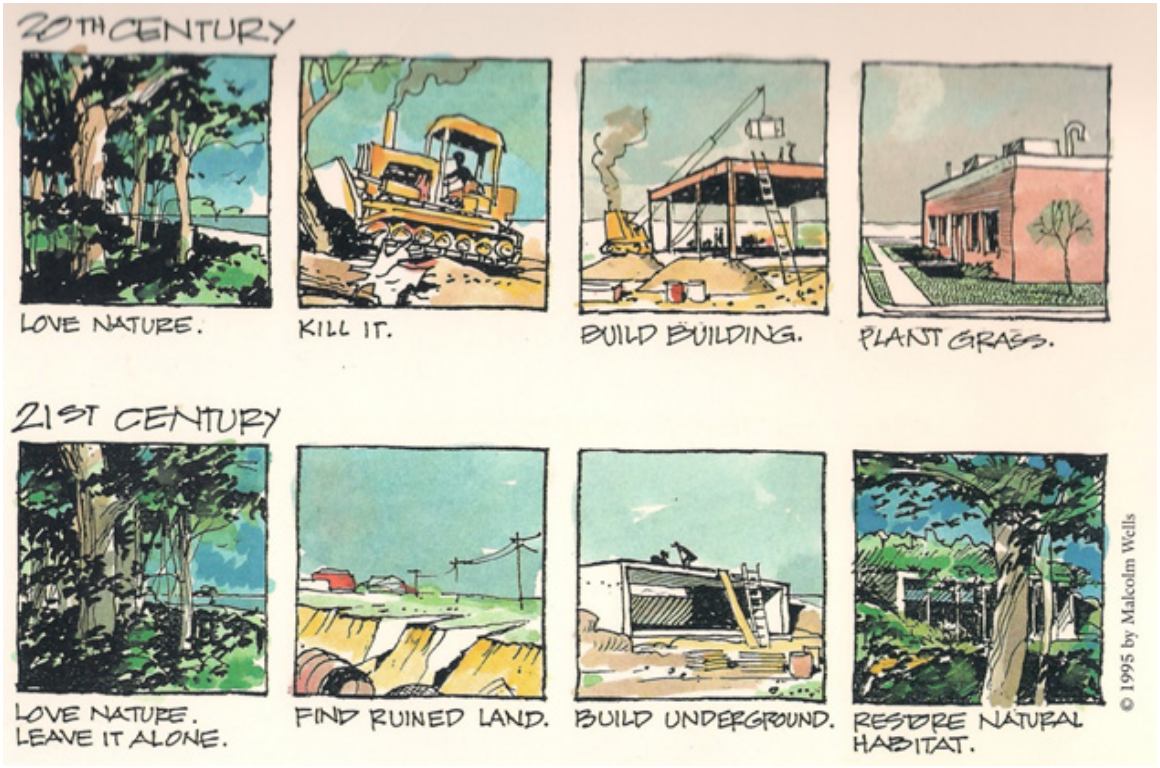

Figure 86: Malcolm Wells's philosophy. (Higginson 2006)

6.3.2. BIOMORPHEMIC APPROACH TO FORM

A biomorphemic approach can be described as artistic design elements based on naturally ocurring patterns or shapes which are reminiscent of nature and living organisms. Wells's approach was not only to mimic but restore the earth's surface. Thus rather than building on remnant land the architecture restores the natural habitat. His approach was not to create underground architecture, but rather use the earth's surface as part of your architectural building material. This type of architecture allows for a sheltered dwelling which functions as a safe and inclusive sanctuary.

The technical approach is building an insulated building, covering it with earth and natural vegetation providing a habitat for new plant and animal life. The implications of this stretches further than inclusive design towards a responsive dwelling which would include the storing of rainwater, the production of food and using solar energy. By creating insulated, earth-sheltered architecture a moderate climate is also achieved.

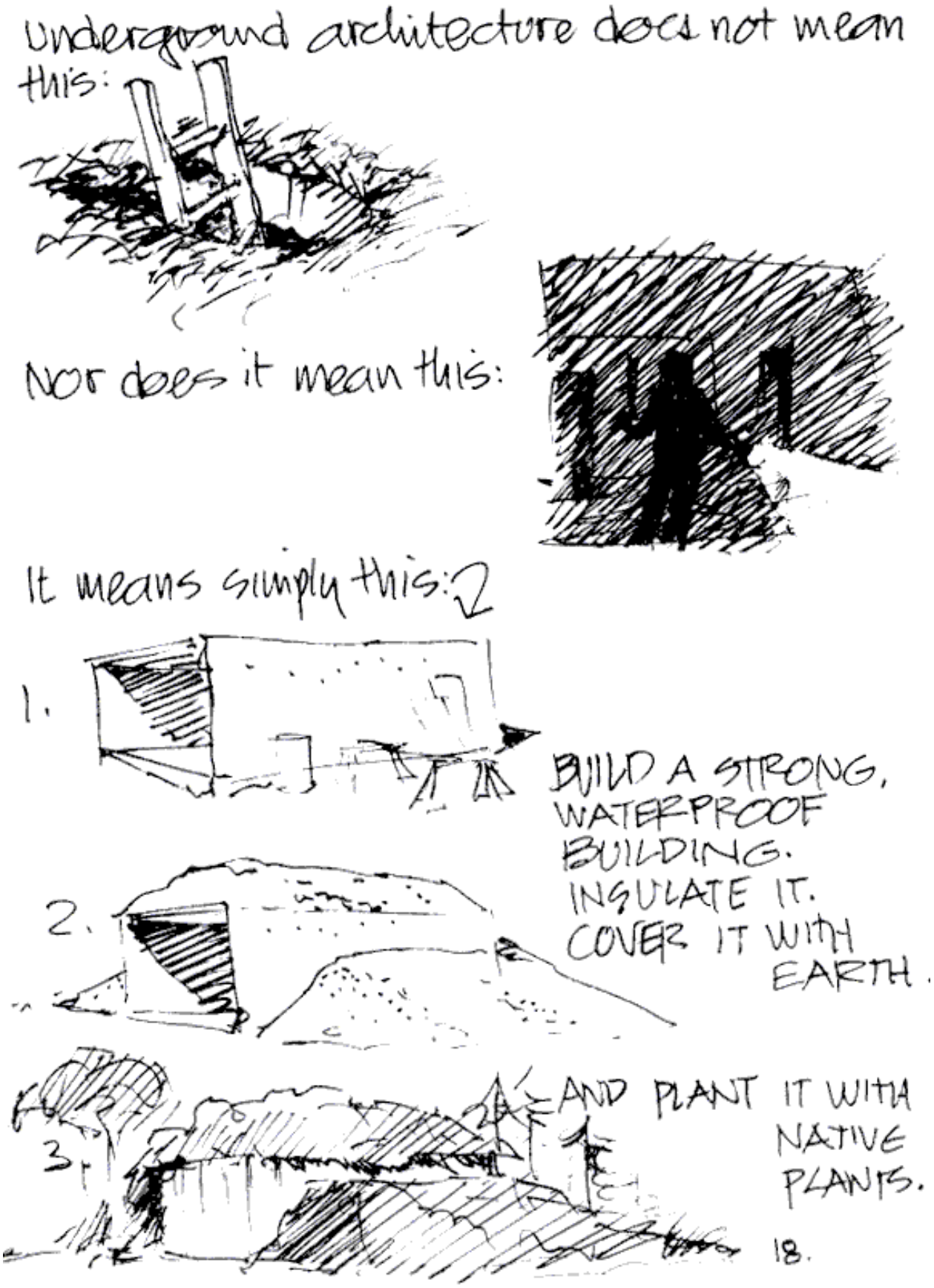

Figure 87: Sketch by Malcolm Wells. (Higginson 2006)

6.4
CASE STUDY 3

FREEDOM PARK

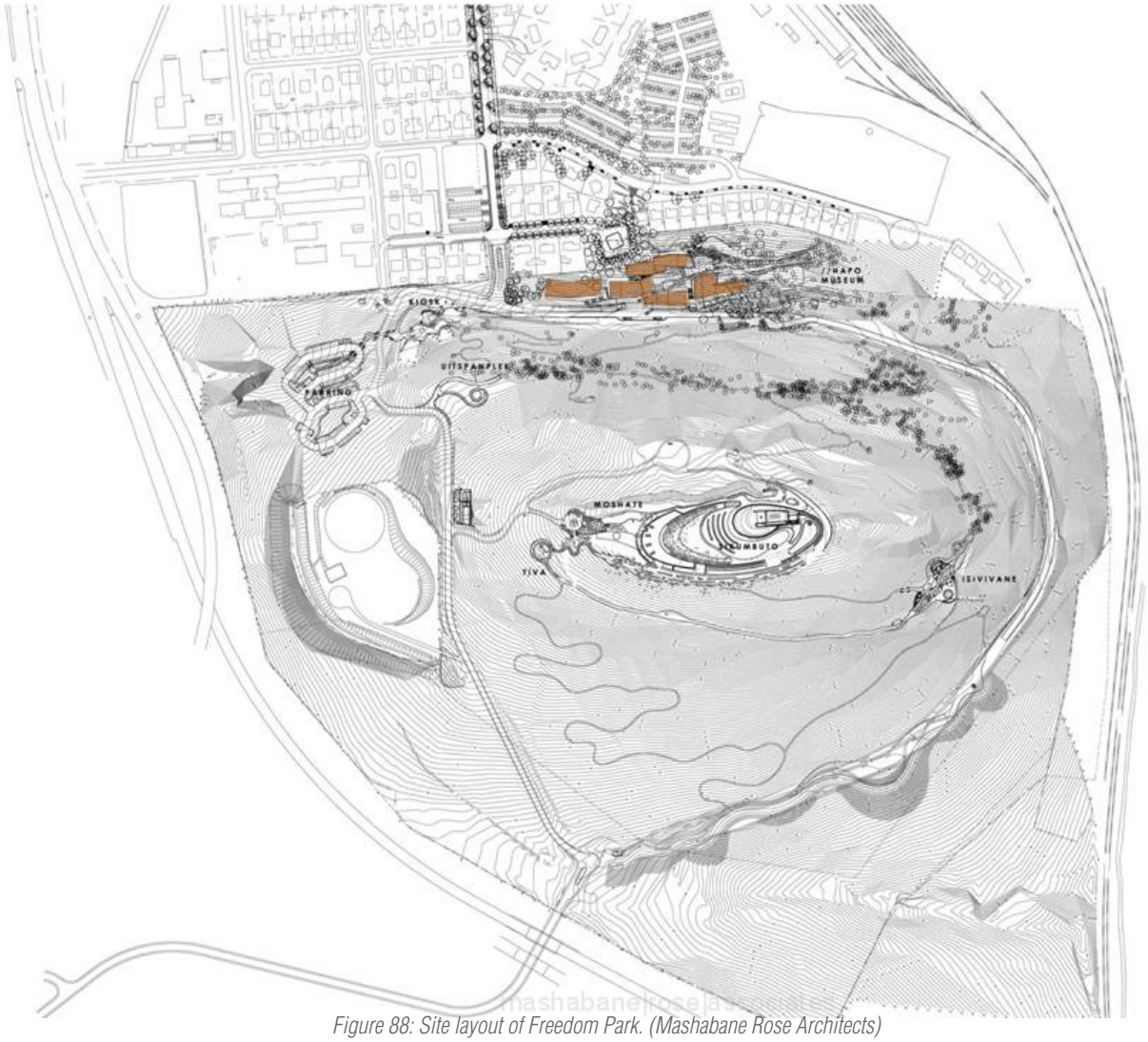

Figure 88: Site layout of Freedom Park. (Mashabane Rose Architects)

6.4.1. AN OVERVIEW

The Freedom Park monument is situated on the eastern slope of the Salvokop Hill - a landscape dominated by politically charted buildings. Due to its context (The Voortrekker Monument, The UNISA campus and forts on the surrounding hills) the architecture had to incorporate dialogue with its context as part of its narrative.

The relationship with surrounding contexts resulted in a narrative journey through the landscape. The elements of design is revealed and connected through a route using the museum to define the 'entrance' instead of anouncing the start of the route. Discovery, rather than direction, is encouraged along the route. The use of architectural elements (stone, water, indigenous vegetation and fire) is rooted in memory and history of African architecture and the historical natural landscape of the hill-top site.

Figure 89: Photographs of Freedom Park. (Mashabane Rose Architects)

The design incorporates the necessity and qualities of a monument being situated on a hill in Tshwane and functioning as a beacon without being intrusive and disrespectful on closer inspection. Integration into the landscape is succesfully incorporated with monumental design that had to consider political contestation and memory in architecture. The design achieved this without resulting in a heavy visual weight. Verticality (beacon element) was achieved through the placement of the ephemeral stainles steel 'reeds' countering the mass of UNISA and the Voortrekker Monument.

The line between architecture and landscape is blurred allowing the building to emerge from the hill as one continues on the path.

6.5
CASE STUDY 4

VERNACULAR ARCHITECTURE

Many forms of vernacular architecture embodies specific spatial principles, especially on plan. What is significant in the following examples, is the manner in which movement can link space and simultaneously create space.

DEGOR HOUSING CLUSTER, MALI, WEST AFRICA
15TH CENTURY-PRESENT

Figure 90: Movement through the Dogon housing clusters. (Ching 2007:70)

DURBAR SQUARE, PATAN, NEPAL, RENOVATED 17TH CENTURY

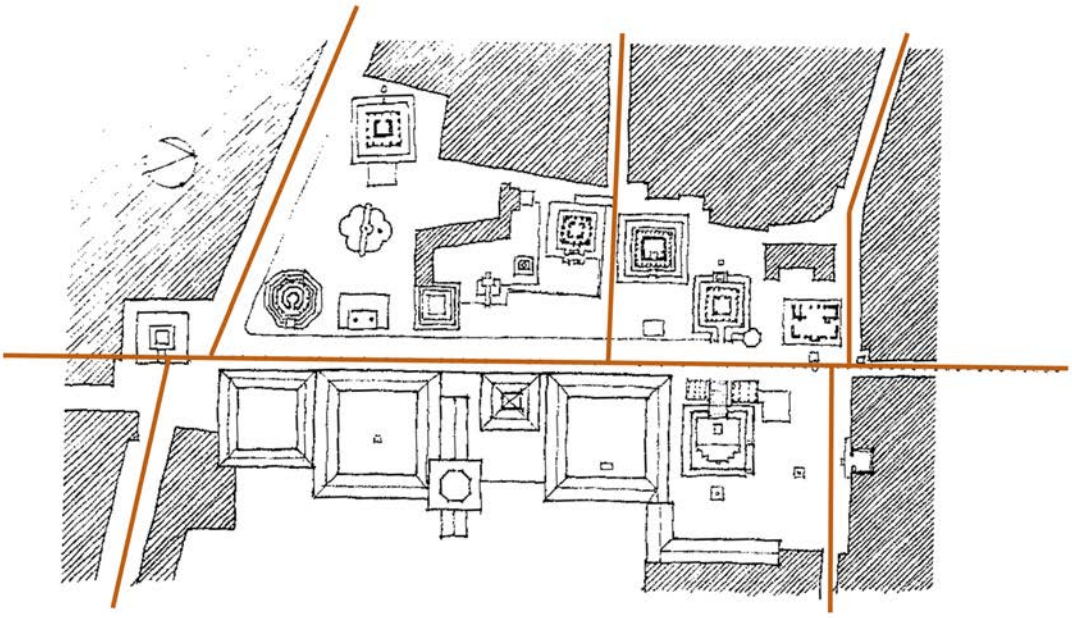

Figure 91: Datum represented in the Durbar Square. (Ching 2007:370)

GUGGENHEIM MUSEUM, BILBAO, SPAIN, 1991-7, FRANK GEHRY

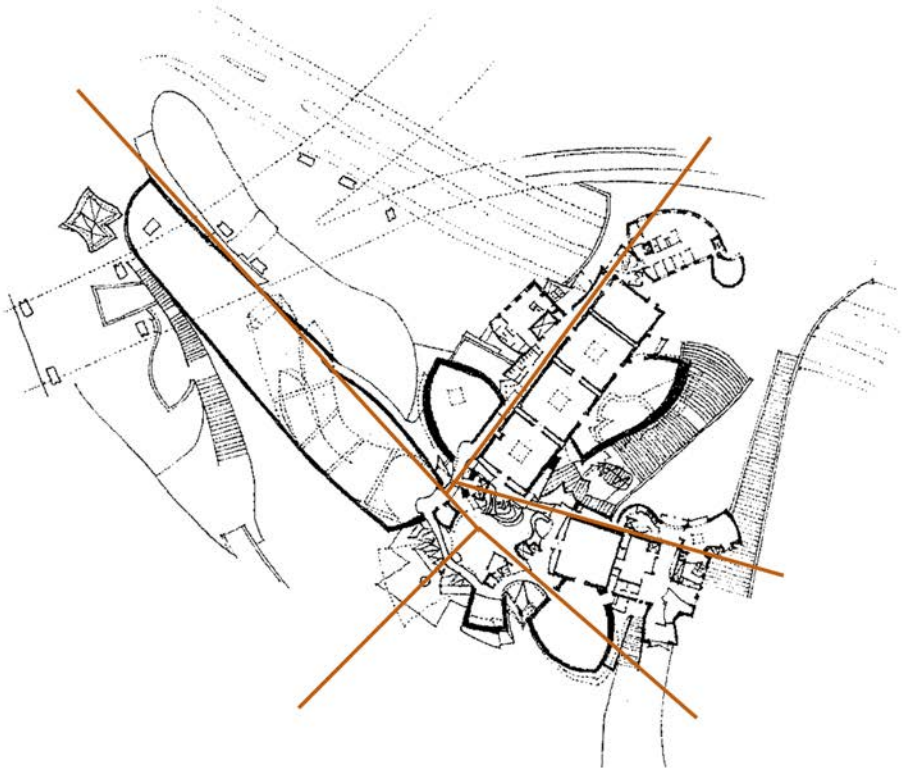

Figure 92: Radial formation of the museum, connecting spaces together. (Ching 2007:221)

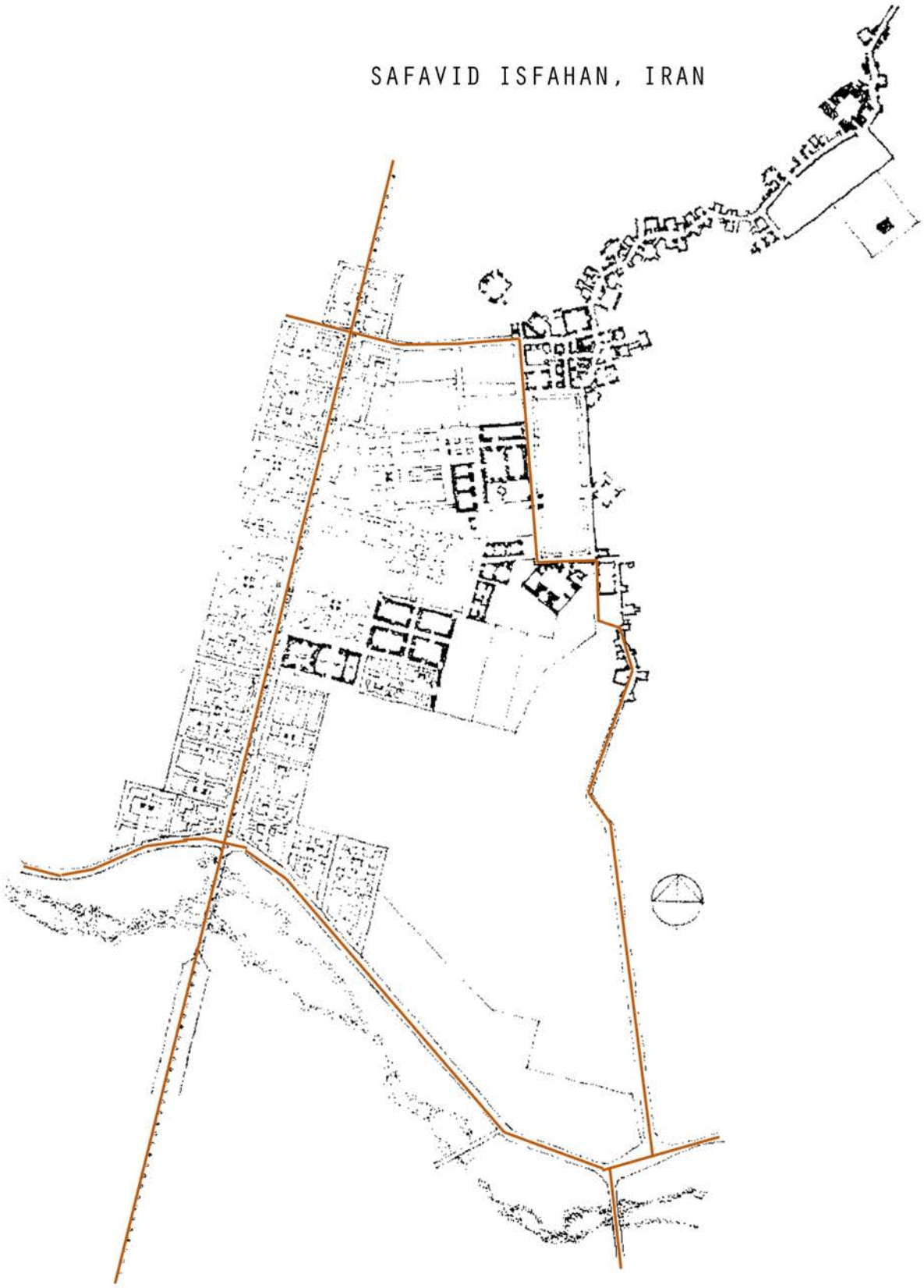

Figure 93: An enclosing of space through passages in the plan of Safavid, Persia. (Ching 2007:370)

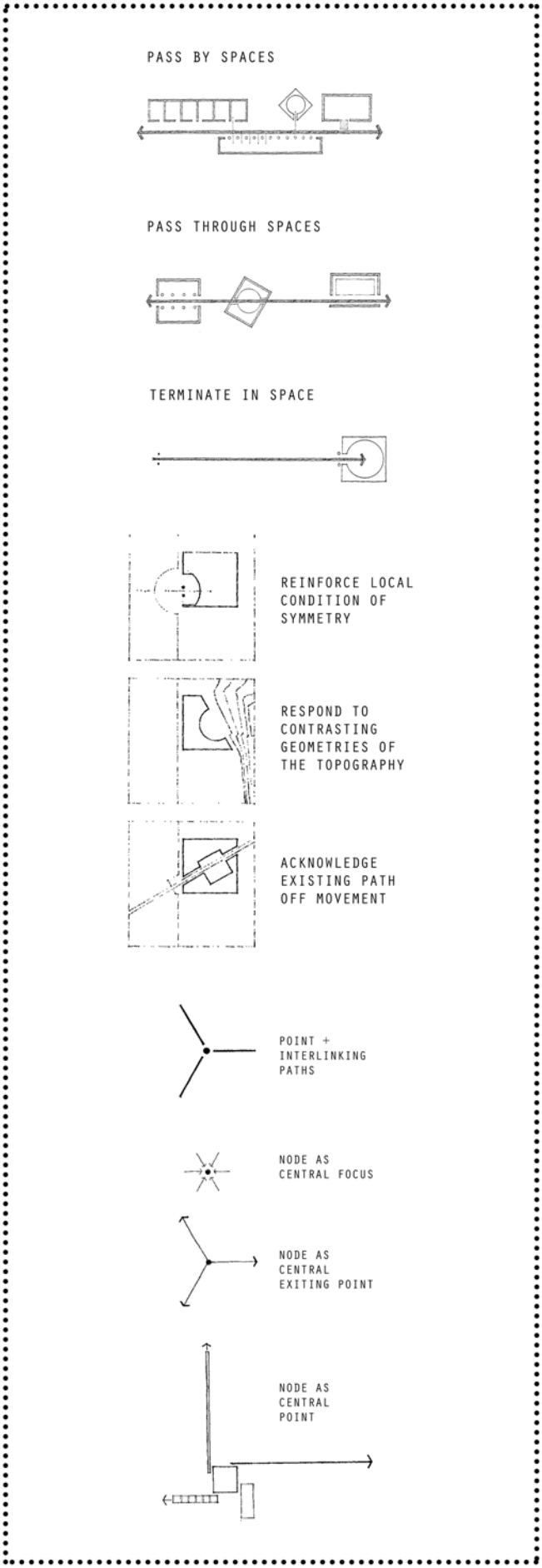

Figure 94: Amalgamation of principles considered in the design development. (Ching 2007)

6.6
CASE STUDY 5

FORTS

Figure 95: Fortification plan of Pretoria. (Van Vollenhoven 1998:11)

6.6.1. OVERVIEW

The history of Pretoria starts all the way back in 1855. Pretoria was named after Andries Pretorius – a national Voortrekker hero of the Battle of Blood River and major role-player in the negotiations for the independence of the Transvaal. His son, Marthinus Pretorius, also a Voortrekker leader and more importantly, founder of Pretoria, decided to honour his father in this way. According to Van Vollenhoven (1998), the founding of Pretoria marked the end of the Great Trek.

It is clear (and almost all sources agree), that the forts were built due to a paranoia that was sparked by the failed Jameson Raid of 1895 (Panagos, 2004). The Jameson raid caused the Zuid-Afrikaansche Republiek to seriously consider the defense of the Transvaal, and particularly that of its capital city – Pretoria.

The government was restless about the growing number of "Uitlanders" (foreigners) on the Witwatersrand, and, to add to their unrest, maps of Pretoria were found in the trunks of a British spy, Captain Robert White (Van Vollenhoven 1998). According to Van Vollenhoven (1992), it was also known that the Reformers had a supply camp near Irene, and were planning on invading Pretoria on 27 December 1896.

Fort Schanskop, Fort Wonderboompoort and Fort Klapperkop were designed by the two German engineers Von Dewitz and Werner from the company Schneider and Krupp (also suppliers of artillery equipment to the ZAR). Architect Christiaan Kuntz and building contractor Celso Giri also had a part in the building of these forts. Fort Daspoortrand was built on the design of Grunberg. Consequently, the three German-built forts had corresponding designs, while Fort Daspoortrant differed from them (Van Vollenhoven, 1998).

All four of the forts were earthen redoubts, and earthen protective ramparts were built to shelter the bombproof rooms below. According to Panagos (2004), this idea was derived from European-style fortifications of that time, which originated in the town of Plevna during the Turko-Russian war of 1877.

Steel used in the construction process came from Germany, while stone from the surrounding area was used. The forts contained the following spaces: entrance gates, stables, officers' quarters, provisions stores, soldiers' quarters, machine room, telegraph room, kitchen, hospital, ammunition store (and reservoir), cannon positions and a drainage furrow. There is a big open space in the centre of the fort.

Other features of the forts include a substantial earthen ramp sloping up to the top of the fort. It is possible to walk the perimeter of the fort on the northern side. From here, being on raised ground, the fort had a clear view of the surrounding landscape, making it possible to see the approaching enemy.

The setting, the use of materials and the act of refuge of the forts, is all relevant in the design development of the proposed intervention.

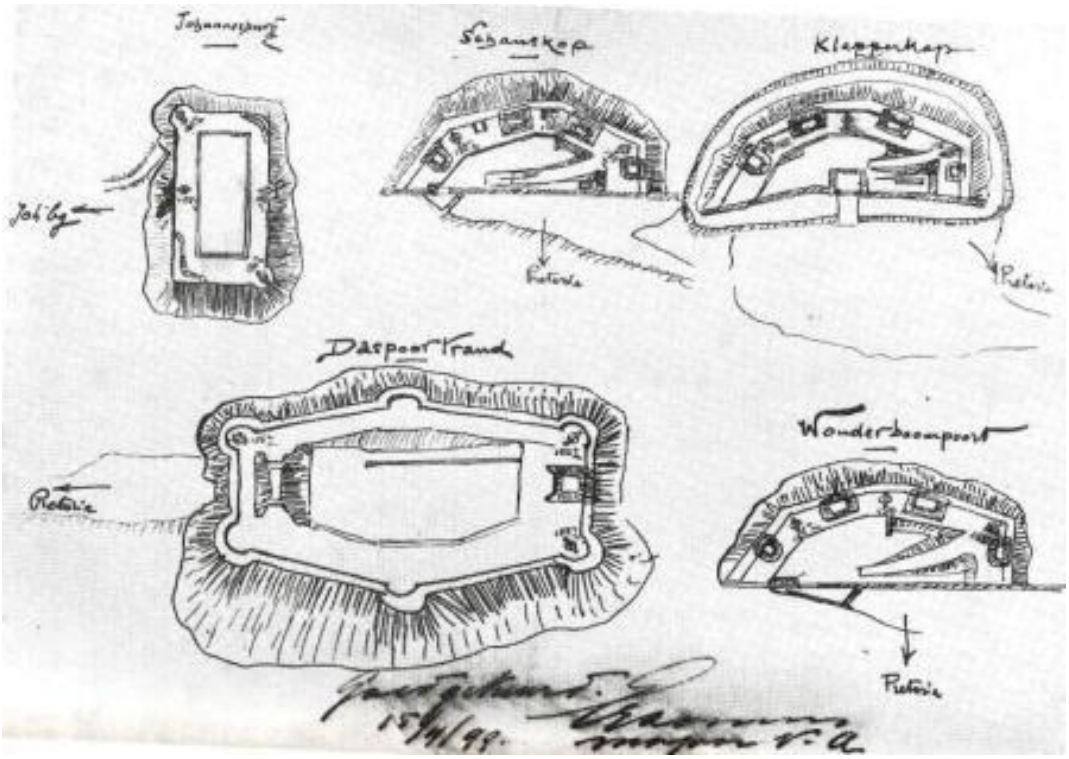

Figure 96: Plan layouts of all the forts of Pretoria. (Panagos 2004)

6.6.2. CONCLUSION

Pretoria's original need to be fortified is carried through into the narrative of this dissertation.

The concept of refuge is evident, as the proposed intervention is isolated from the CBD and located on the periphery for protection from the destruction of the inner city.

Using the principles of the existing fortifications, the intervention aims to function independently from the rest of the city, with systems activating the structure to form a living organism. Although the structure only serves as a starting point for future organic development attached to the structure, the intentions are clear in the robust nature of the building.

Strategies of camouflage and protection are embedded in the technical resolution and layers of compilation of materials. Areas of the site are vegetated to provide food for the users as well as artefacts for further study.

The overall concept of the design is preservation, thus the structure protects and preserves natural and human elements inside and adjacent to the building.

The existing reservoirs serve as batteries for energy purposes as well as the potential to house aquaponics. Although the water in the reservoirs is an existing resource, a specific quantity is pumped from the reservoirs to serve the building and vegetation.

Based on the language of existing forts around Pretoria, natural materials such as clay, sandstone and shale are re-used from excavations to form thermal mass structures for environmental and heritage value. Ecology on the site is seen as a heritage element due to the fact that the site is the original location of the botanical gardens of Pretoria and should be preserved and touched lightly as much as possible in the overall scheme.

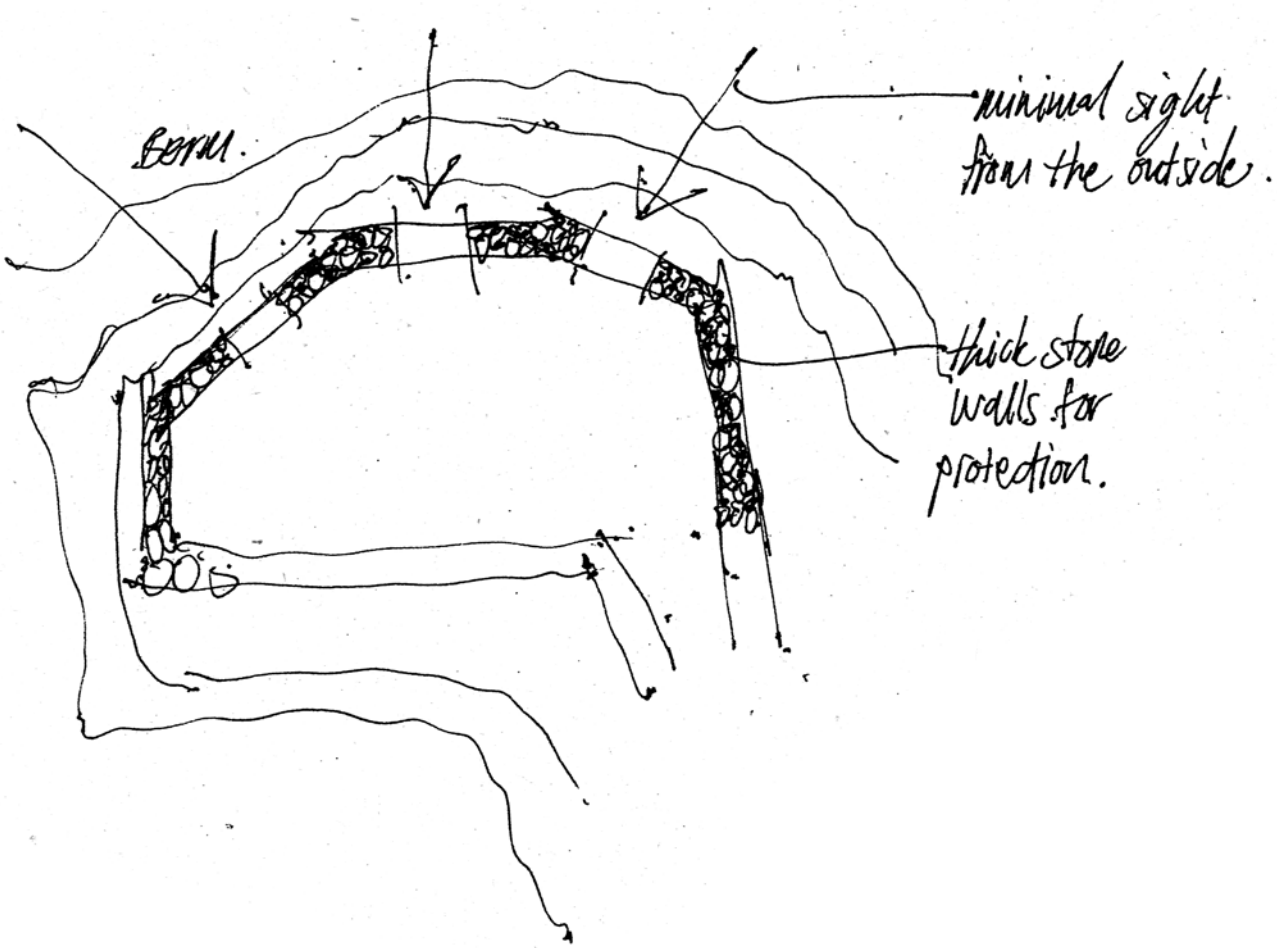

Figure 97: The relevance of observation without being seen, in a fort. (2016)