University of Pretoria etd – Blokland, J (2007)

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Submitted as part of the requirements for the Degree MArch (Prof)
in the Department of Engineering, the Built Environment and Information Technology
at The University of Pretoria
2006



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History:

When President Paul Kruger established Pretoria as the capital city of his Boer Republic and proceeded to divide the area into farms which were given to some of his important officials. (Interview by L. Mathole; 1996) The farm Vlakfontein, where Mamelodi is situated today, was his favourite place to get away from his office and relax. He reportedly always took his flute with him, and was known by locals here for his ability to uncannily imitate the songs of birds. One version of the story of the name Mamelodi credits the origin of the name to these melodies. (ibid.)

At the time of the Boer occupation, the area was already home to a Sotho tribe, headed by chief Mogale. (ibid.) This is reportedly how the Magaliesberg Mountains got their name. His compound was situated on the hill above what is today known as Eersterus. The hill housed his home and the valley below provided him with fertile farming land. The hills above what is today Mamelodi, were traditionally used for coming of age rituals for his young men. They continue to be used for such activity to today, although the encroaching settlement of squatters threaten



Fig1: Early housing development, Mamelodi

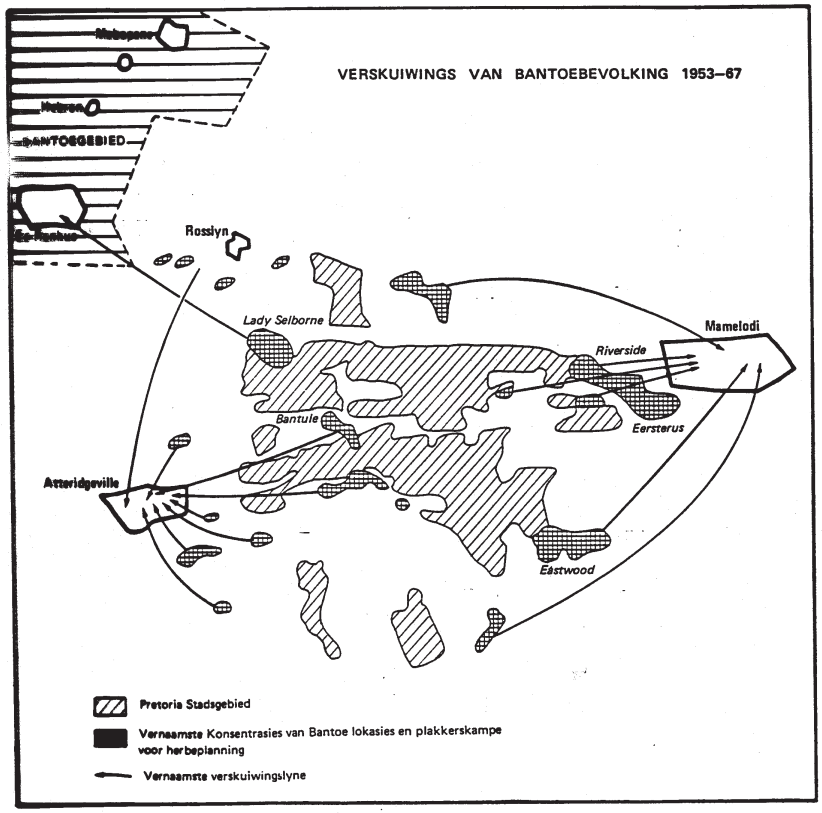


Fig2: Resettlement patterns in Pretoria

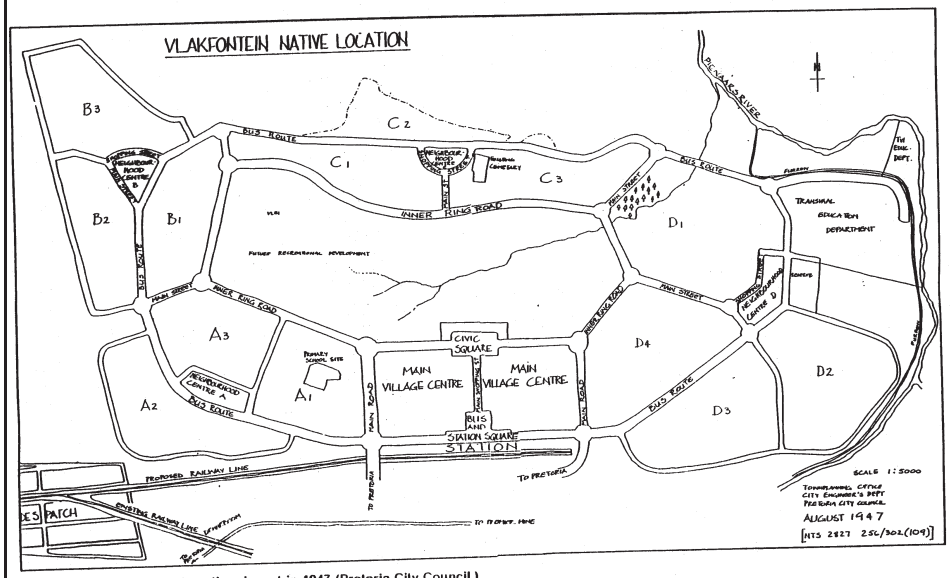


History

Fig3: Eerste Fabriek in 1953



Fig4: The original urban layout of the farm Vlakfontein



Map 2: Vlakfontein Native Location: layout in 1947 (Pretoria City Council.)

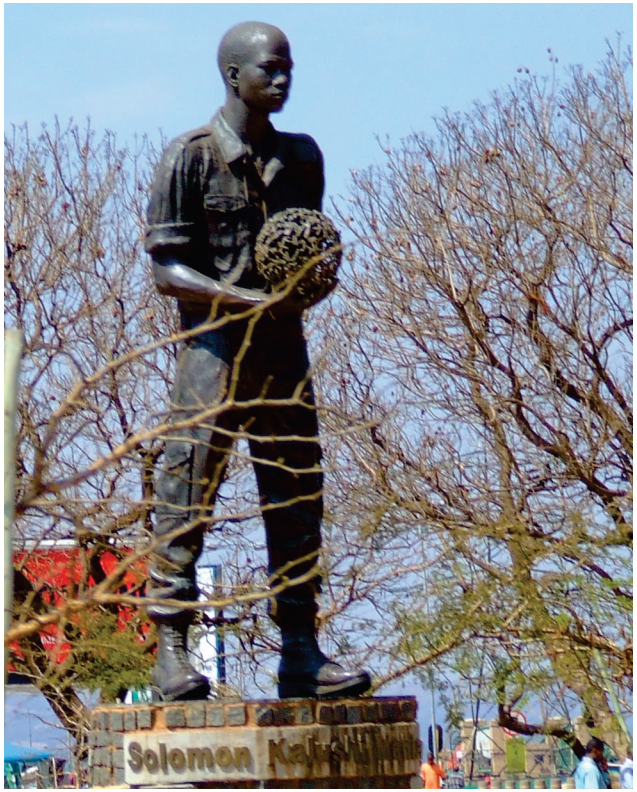


these activities, as SeSotho youths are not allowed to be seen by anyone not attending the school for the duration of the ritual (about three months).

In 1947, the first housing in Mamelodi was built, modelled on a Botswanan rondavel. (ibid.) Being urban people, however, the newly relocated residents were insulted by the primitive typology they saw being associated with them and refused to occupy the buildings. These rondavels were subsequently converted to a school and the people took occupation of more geometrically arranged housing that was later built. Today the rondavels remain as a testament to what was once Mamelodi's "Bantu" school, a school attended by many prominent residents of Mamelodi, not the least of whom was "The Arch" himself, Desmond Tutu.

In the 80s and early 90s, Mamelodi began hosting jazz festivals for its people. These were more than just hedonistic celebrations, but disguised political rallies that fuelled the struggle for equal rights during Apartheid South Africa. (ibid.) Famous musicians such as Miriam Makeba and Hugh Masikela are known to have attended and performed at these festivals, which saw the attendance of as many as 90 000 people from as far a field as Cape Town. These festivals are still held

today, at least twice a year, in their eventually formalised venue, Moretele Park, a large recreational park at the foot of the mountains and there are more attendees than ever. The last concert was attended by at least 150 000 people.



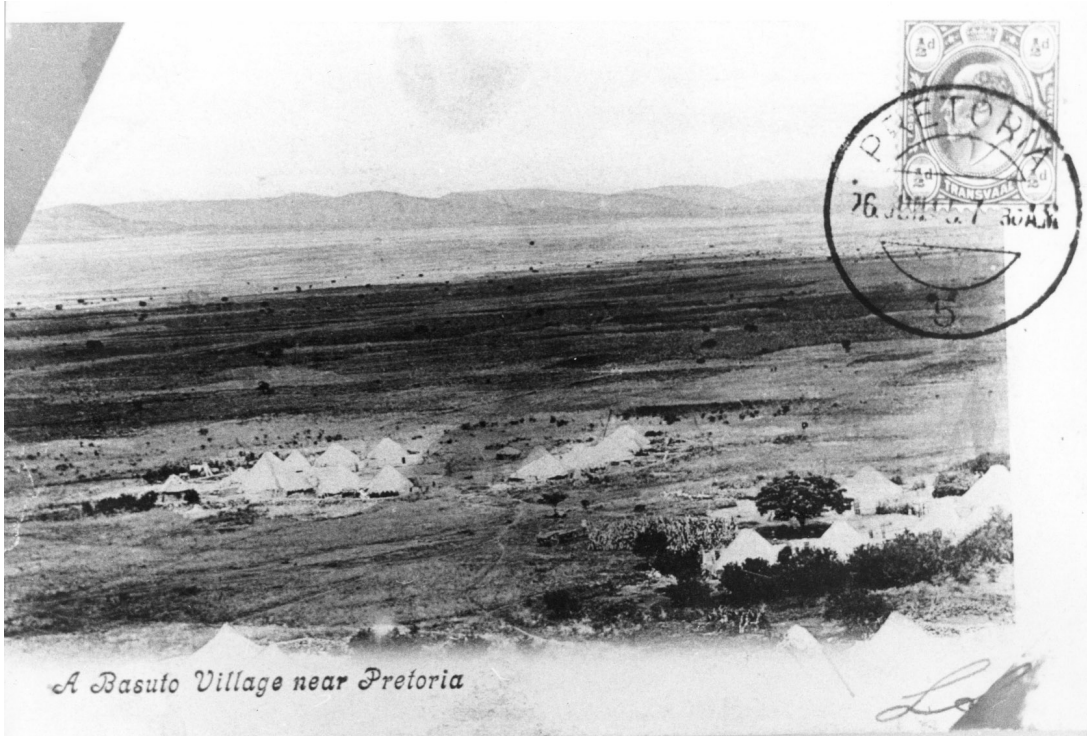
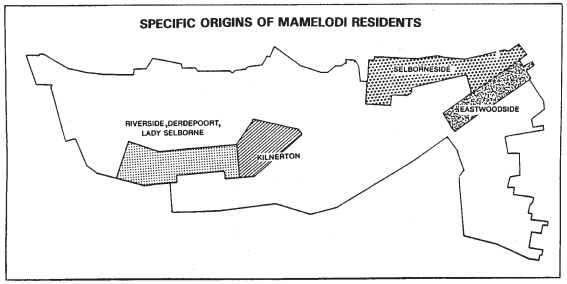


Fig5: Settlements on the farm Vlakfontein prior to the establishment of Mamelodi

Fig6: Solomon Mahlangu statue

Fig7: Specific Origins of Mamelodi residents

Fig8: Ethnic grouping in early Mamelodi



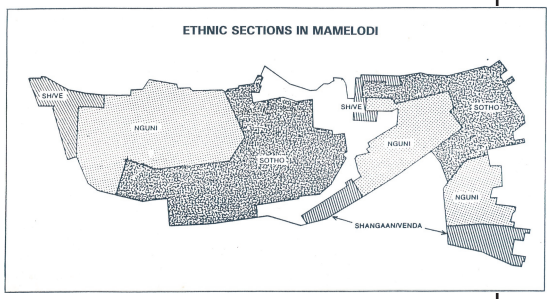






Fig9: The entrance to Mamelodi along Stormvoel Road

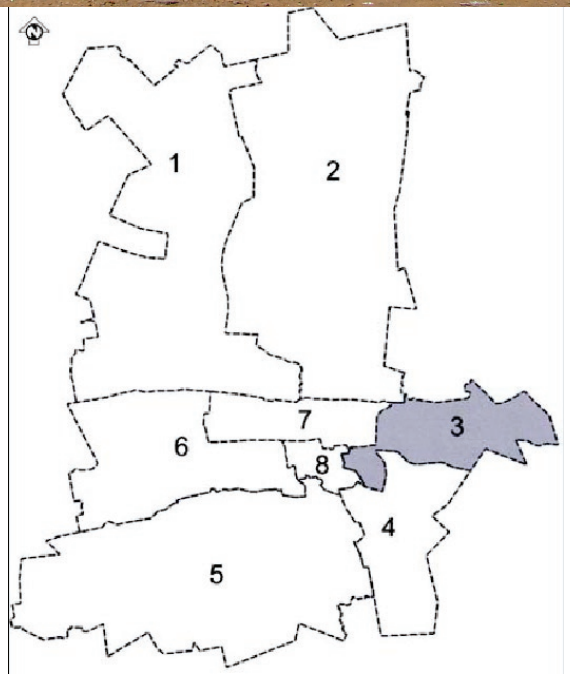


Fig10: Administrative regions in Tshwane; Mamelodi falls in Region 3



CITY OF TSHWANE
we are the same

Introduction

The Tshwane Metropolitan Municipality (CTMM) is currently in the process of establishing a heritage route and tour through Mamelodi. The route includes a number of sites considered to important in terms of cultural or historical significance. These sites form part or a journey through Pretoria where visitors are to experience accounts and sites of the freedom struggle. Tshwane is branding itself as a city of learning, freedom and trying to give weight to the fact that it is the administrative capital of South Africa.
Moretele Park is the current venue for jazz festivals in Mamelodi and forms a part of the heritage route. Festivals are organised by the park authorities in conjunction with a private organising body and various sponsors. The stage is always a temporary structure comprising of scaffolding and cladding. It is usually positioned on an embankment between the Moretele and Pienaars Rivers, facing the park with the mountain as backdrop. The festival remains popular, drawing crowds from all over the country.

For the rest of the year, the park is used as a recreational facility or as a destination for school trips. Its facilities include a water slide and swimming pool, braai areas, an unused hall, various ablutions around the park and a

restrictive access fence with access booths for the jazz festivals.

There is clearly a need to upgrade some of these facilities, particularly the hall and an opportunity also exists to formalise the facilities for the jazz festivals.

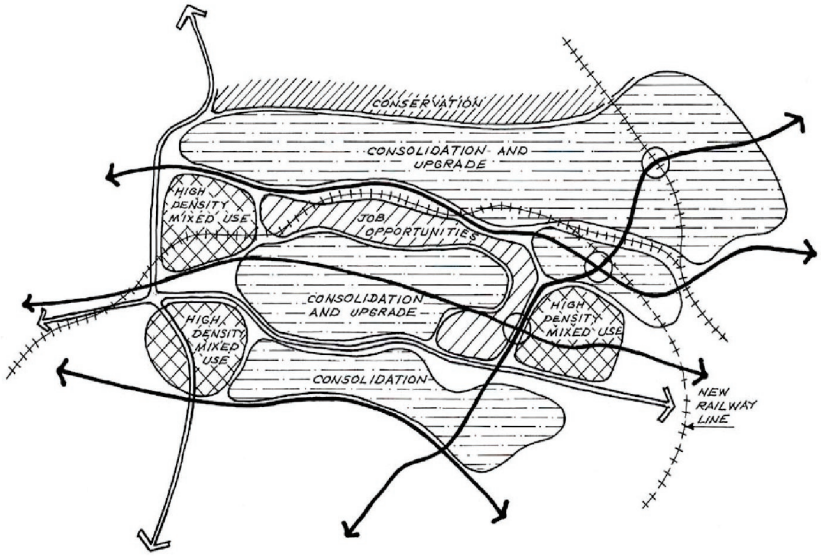


Fig11: Spatial Development Framework for Region 3

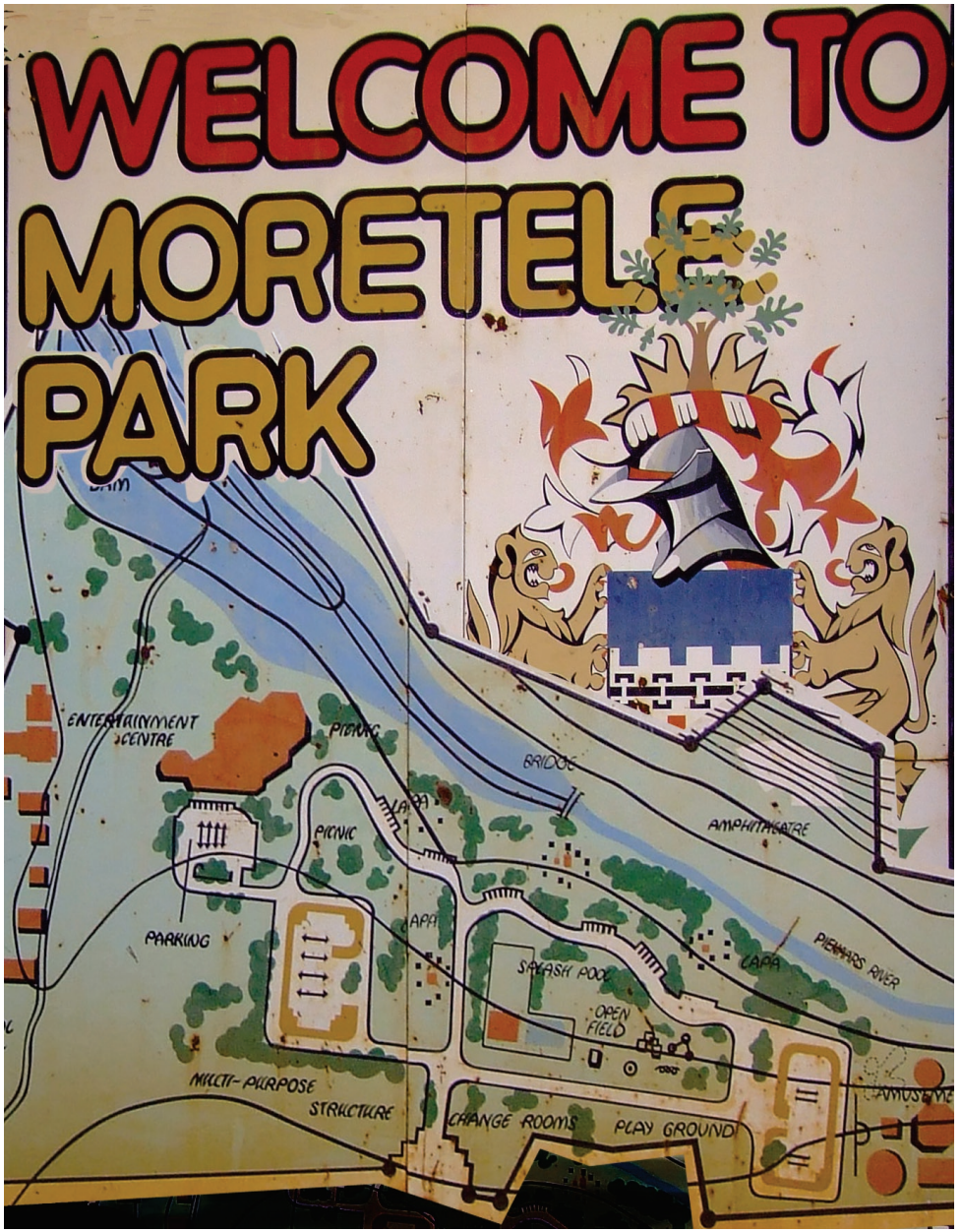
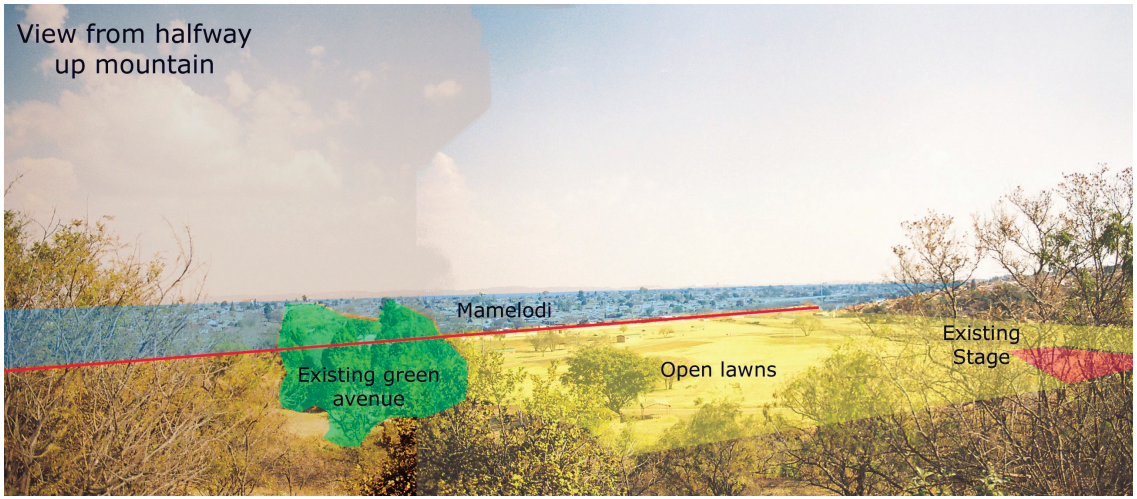


Fig12: The entrance signage currently in the park shows a vastly different design from what is to be found there



Fig13: View over Moretele Park from the mountain



Brief

Provide a formal facility for the hosting of festivals and gatherings in Moretele Park. The intervention is to be flexible in function, so that it can be used as a theatre or meeting place for political rallies or other public gatherings. Seating is to be provided against the slopes of the Magaliesberg foothills, but crowds are still to be accommodated on the lawn of the park (as is currently the case). This requirement calls for a bi-directional stage or a platform upon which various stage designs can be explored.

Fig14: Panoramic view of far river bank.





Access across the river necessitates at least one foot-bridge. The facilities of the current hall are to be upgraded or replaced so as to provide a more feasible long term facility which can be used year round, both formally and informally.

Moretele Park, being one of the proposed stops on the Mamelodi Heritage Route, requires a facility to cement its status as a heritage site. It must be in line with the spatial development framework and the environmental impact assessment, and "plug" into the rest of the heritage route in a logical and meaningful way.





Fig15: Stormwater drain in Moretele Park stabilised with gabion walls

Fig16: Gabion walls in the park

Fig17: Smokey concerts in the park

Fig18: The stage used in the festivals are temporary structures







Fig19: Hundreds of thousands of enthusiasts attend the music concerts in the park.



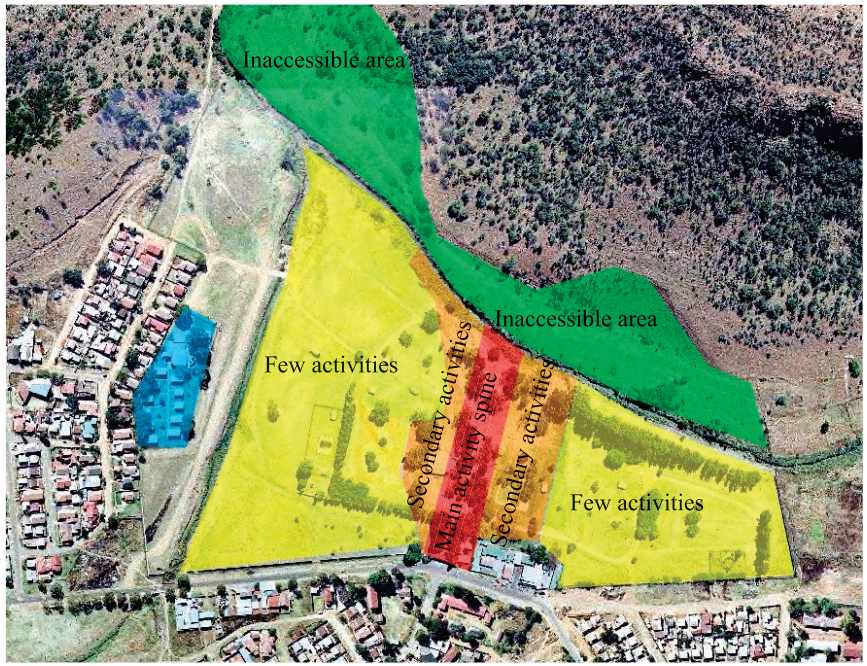


Fig20: Analytical Aerial photo of Moretele Park

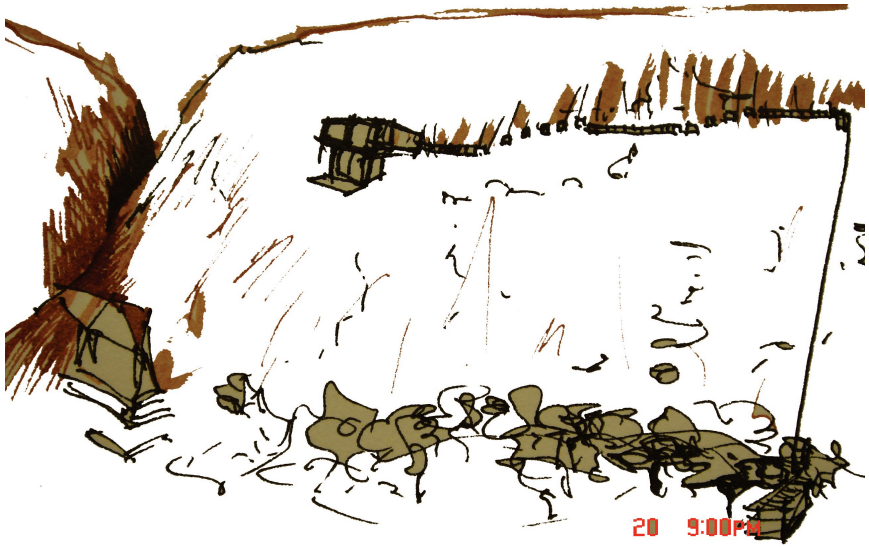


Fig21: Sketch exploring activities against the slopes of the mountain above the park



Project Outline:

A visual analysis hints at a major axis through the park, which has been interpreted as a footpath. Activities in the park have been restricted to pedestrians and vehicular access limited to near the street entrance. Most activities are fed by access from the pathway.

The existing hall will be replaced with an open shelter area serviced by a formal kitchen with a capacity to serve 150 – 200 people. There will be no walls enclosing the major shelter, but canvas screens will provide adequate enclosure for formal functions. This will allow for year round use of the facility without supervision or restriction while at the same time permitting its formal use at special events. The kitchen and cafeteria as well as ablutions are to be accommodated in rammed earth rooms built on locally sourced stone footings. This goes towards addressing the stigma that traditional beliefs are primitive and inferior as held by many local blacks.

The shape of the amphitheatre is informed by the required shape of the seating and the concept of seating as an impression on the existing landscape as illustrated by the drawing below.

As a means of contributing to the Mamelodi Heritage Route, the elevation provided by the slope can be utilised to provide a view over the township. This was the original position of the home of Chief Mogale and the user thus “looks through his eyes” when using the lookout to be provided at the base of the cliffs. This lookout will visually link the various heritage sites around the township. The tool employed for this visual link will be the beacon, to replace street lights outside the various heritage sites. These beacons will replace street lights and provide visual links between sites as well as from the lookout platform, thus going towards providing Mamelodi with a legibility solution for the wary tourist.

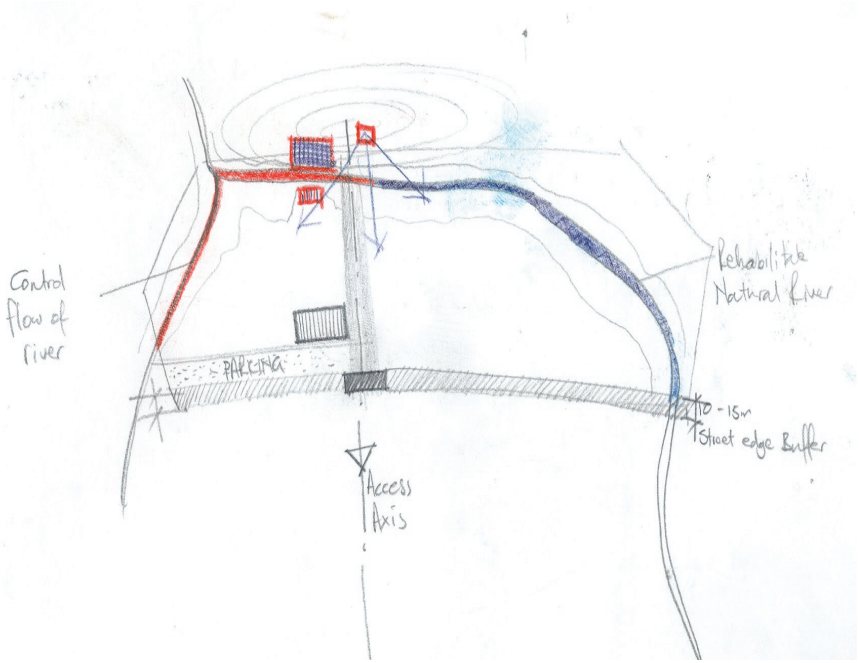


Fig22: Conceptual layout for park intervention

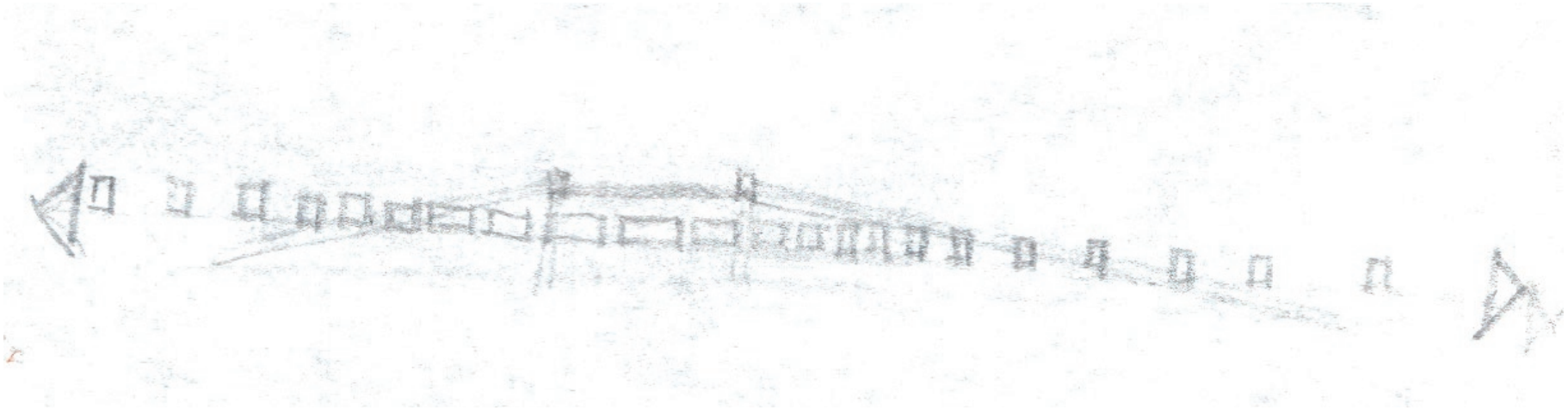


Fig23: Conceptual structure echoes form of mountains, “fades” toward the edges



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Context and Urban structure

Global position.

Locality.

Urban analysis:

Mamelodi is a township sited about 20km East of the Pretoria CBD. It lies parallel to the N4 highway and Pretoria Road (an extension of Church Street). The township is accessible by two main roads, Simon Vermooten and Hans Stydom as well as by rail. Moretele Park is situated approximately 2 km form Tsamaya Road, the main road through Mamelodi. The back of the site open up to the Magaliesberg Mountains. It is surrounded entirely by high density residential development and is accessible by only one main entrance.

Visual analysis:

From an urban analysis point of view, Moretele Park lies outside the somewhat haphazard grid that informs the sub-urban structure of the surrounding area. The main entrance to the park lies at the end of a major road and this road has been recognised in the establishment of the new main axis through the park. Activities are positioned on both



Fig24: Position of the capital city in the counrty

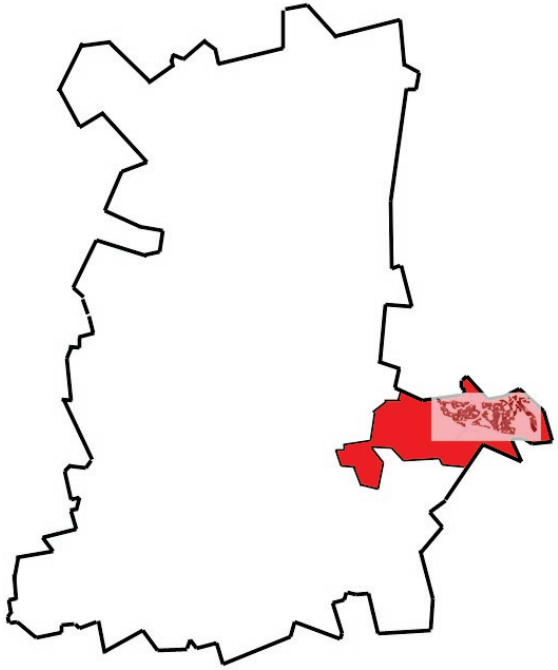

Fig25: Location of Mamelodi relative to the administrative boundary of Tshwane





Fig26: Spatial layout of Mamelodi and park position



Fig26a: Position of Moretele Park in Mamelodi



sides of this axis effectively making it a spine of activity. Existing recreation areas such as shaded braai areas and the swimming pools and slide lie east of the axis and a large open kikuyu lawn lies to the west.

The axis is continued over the river to the opposite bank where the amphitheatre is proposed. From this point, the user can make his/her way up the slope either directly over rough terrain or via a series of ramps to gain access to higher seating or continue past to the proposed lookout platform, the “Eye of Mogale”.

The platform lies at the base of the cliffs above giving a vantage over the valley below. The entire township, bar a small secondary valley, can be seen from this point.

Beacons which replace street lights are proposed along Tsamaya and other main roads to give reference points from which to view the township. These beacons serve a second function of creating more legible road navigation at street level.

Node points and beacon placement: see adjacent diagram

Context

Environmental investigation

The foothills of the hill behind Moretele Park are filled with indigenous plants, particularly protea trees, “bobbejaan sterte” and a variety of aloes, grasses and mesembs (rock succulents). There are no recorded red data species to be found here. The Pienaars River is littered with pollution washed down from upstream, but a large number of water birds still flourish here: moorhens, bishops, weavers, egrets, herons and geese to name a few. The impact that the proposed intervention will have is negligible in the area. By making people aware of the environment and the natural beauty of the area, upstream pollution and littering should be discouraged to a large extent.

MOMS: “Ideas of the youth”

Moms is an acronym used by some of the Mamelodi youth. It means “mother of music and melodies”. Many young people live in Mamelodi and commute commercial centres for work, however the night life in “Moms” is a bustling affair. Numerous clubs and bars break out onto the streets from shopping complexes and houses and literally hundreds of attendees can be served from a small space. The street is the setting for many a party and gathering. Clubs like





Fig27: Blooming trees on the mountain

Fig28: Small plants among the angular quartzie on the slopes





Fig29: steep slopes provide the neccessary angle sor seating

Fig30: Bobbejaan Stert





Fig31: the lower, stte-pest part of the slope has little vegetation

Fig32: the access bridge over the river is a simple steel structure



Context

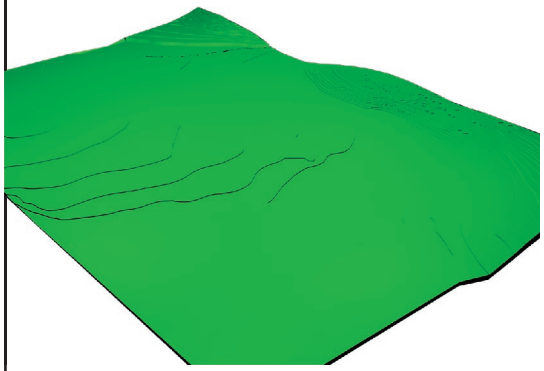

Fig33:Topography of the park from the South East



Fig34: Topography of the park from the South West

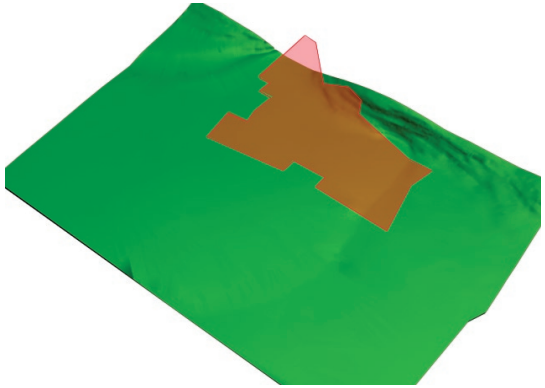

Fig35: Position of the park against the slopes

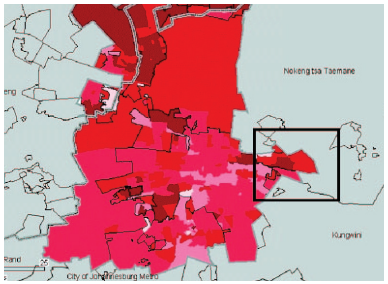

Fig36: Stats SA image showing population density

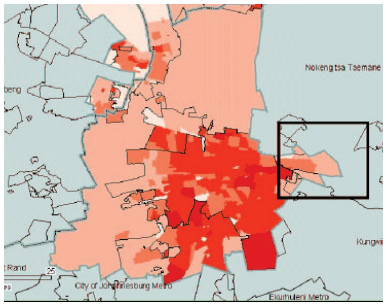

Fig37: Stats SA image showing service delivery

Note that dark implies density in the adjacent images



"Corner Couch" and "Club 69" thrive in the evenings. Local youths made good such as soccer players and businessmen dress to the tee and can often be seen around in the township.

Site analysis:

Topographic study:

Geological information:
See technical chapter

Climatic characteristics:
See technical chapter.

Positioning of building
See Design Development chapter.

Accommodation calculations:

With gatherings in massive numbers at certain times of year, as is the case during music festivals, and much smaller numbers of people throughout the rest of the year, numbers used to determine required accommodation have had to be estimated. Festivals will still have to be catered for by independent organisers where as many as 150 000 people can be expected to attend.

Permanent facilities will include a kitchen which can cater for up to 400 people as a cafeteria kitchen or 200 people as a formal

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restaurant venue where more than one course may be required.

Ablutions found around the park will accommodate most day users and a small number of toilets will be provided in the shelter area.

The amphitheatre must be viewed as a facility which can accommodate more people than the current largest Mamelodi venue, the Mamelodi Community Hall which seats up to 2000. The amphitheatre will be designed to accommodate approximately 6000.

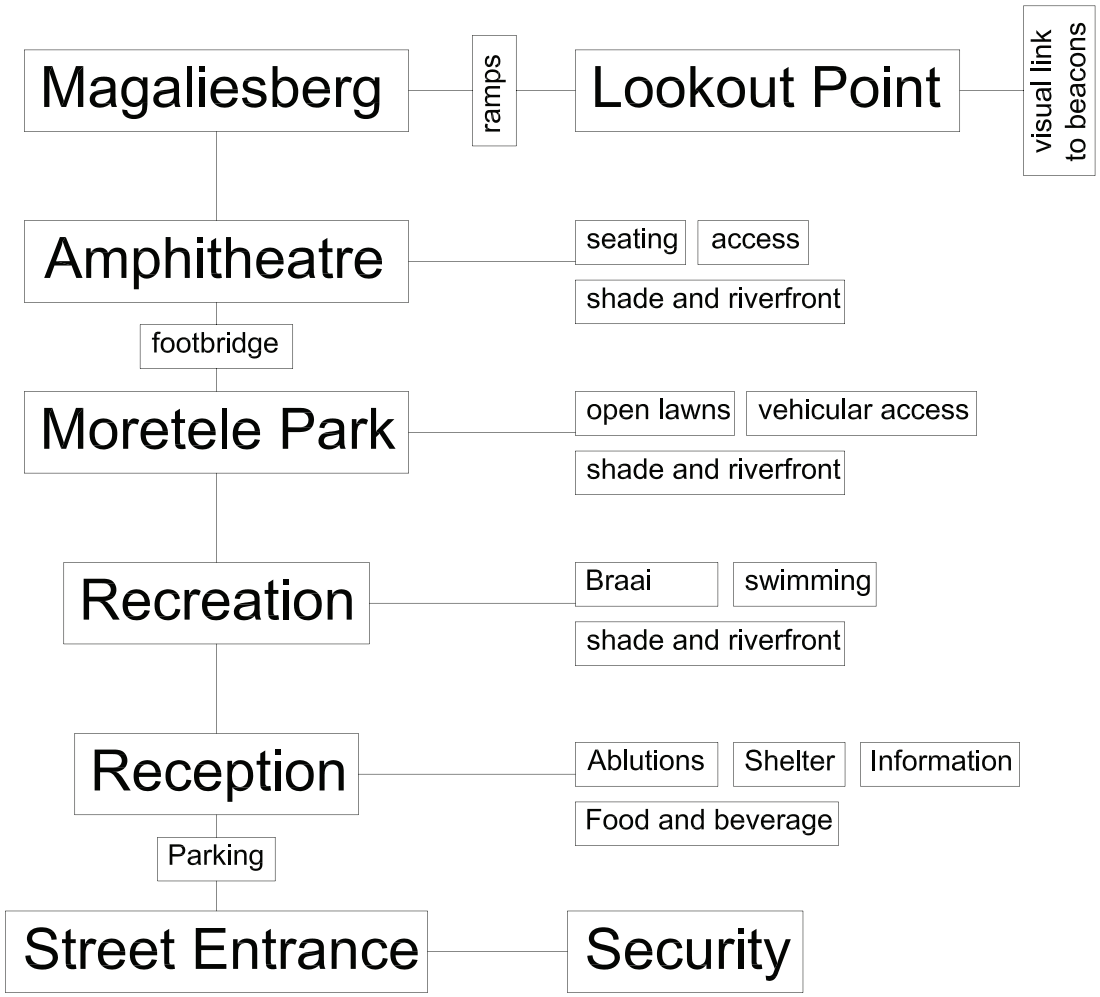


Fig38: Diagrammatic representation of the required program



Fig39: Aerial Photograph of the park





Context



Fig40: Park boundary and surrounding urban features



Fig41: Density of use

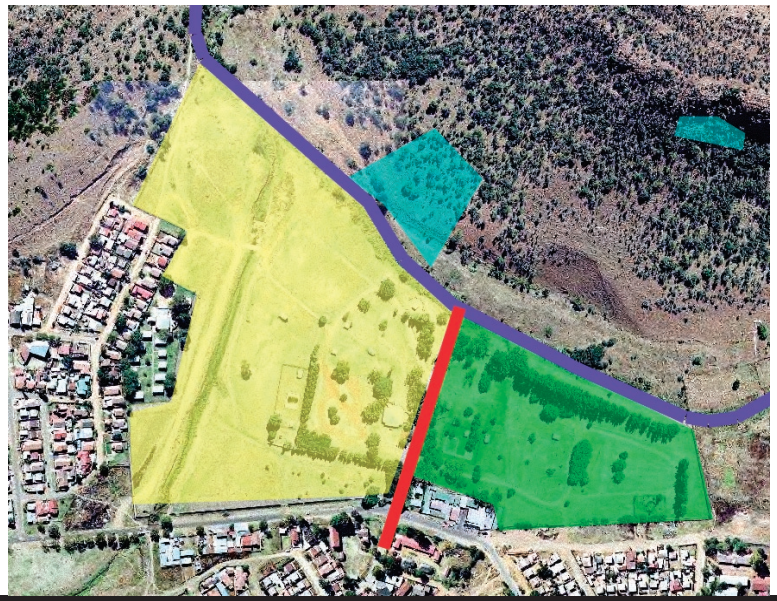


Fig42: Current layout of park and main activity axis



Fig43: Expected increase in activity concentration if access is provided across river



Context

Fig44: Panoramic view of surrounding mountains





Panorama of surrounding mountains















Fig51: Trees around the swimming pools

Local photos

Fig45: Existing community hall

Fig46: The water slide

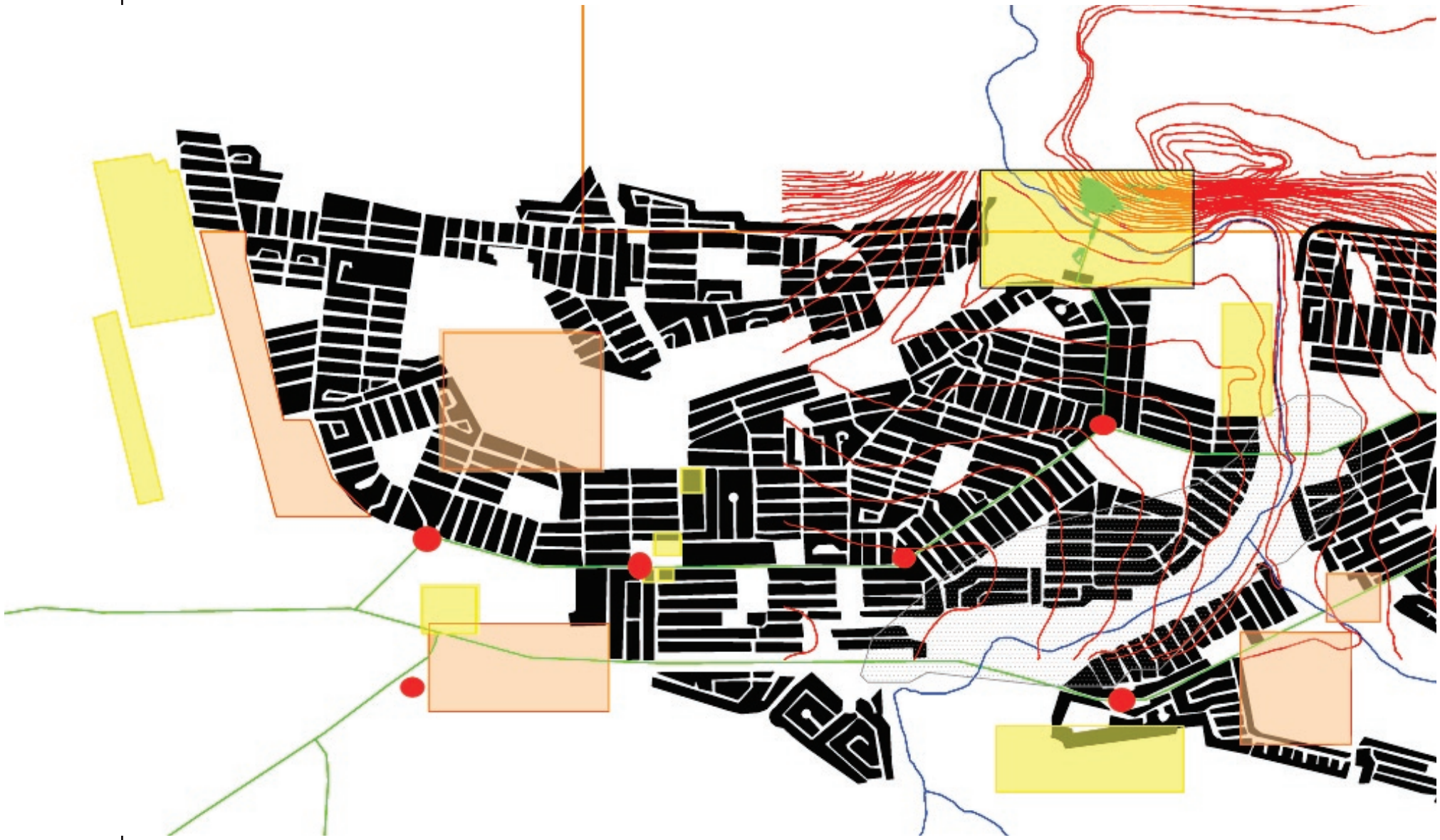
Fig47: Deep shade along the rivers edge

Fig48: Swimming facilities

Fig49: Platform for water slide

Fig50: View from platform







Urban Context

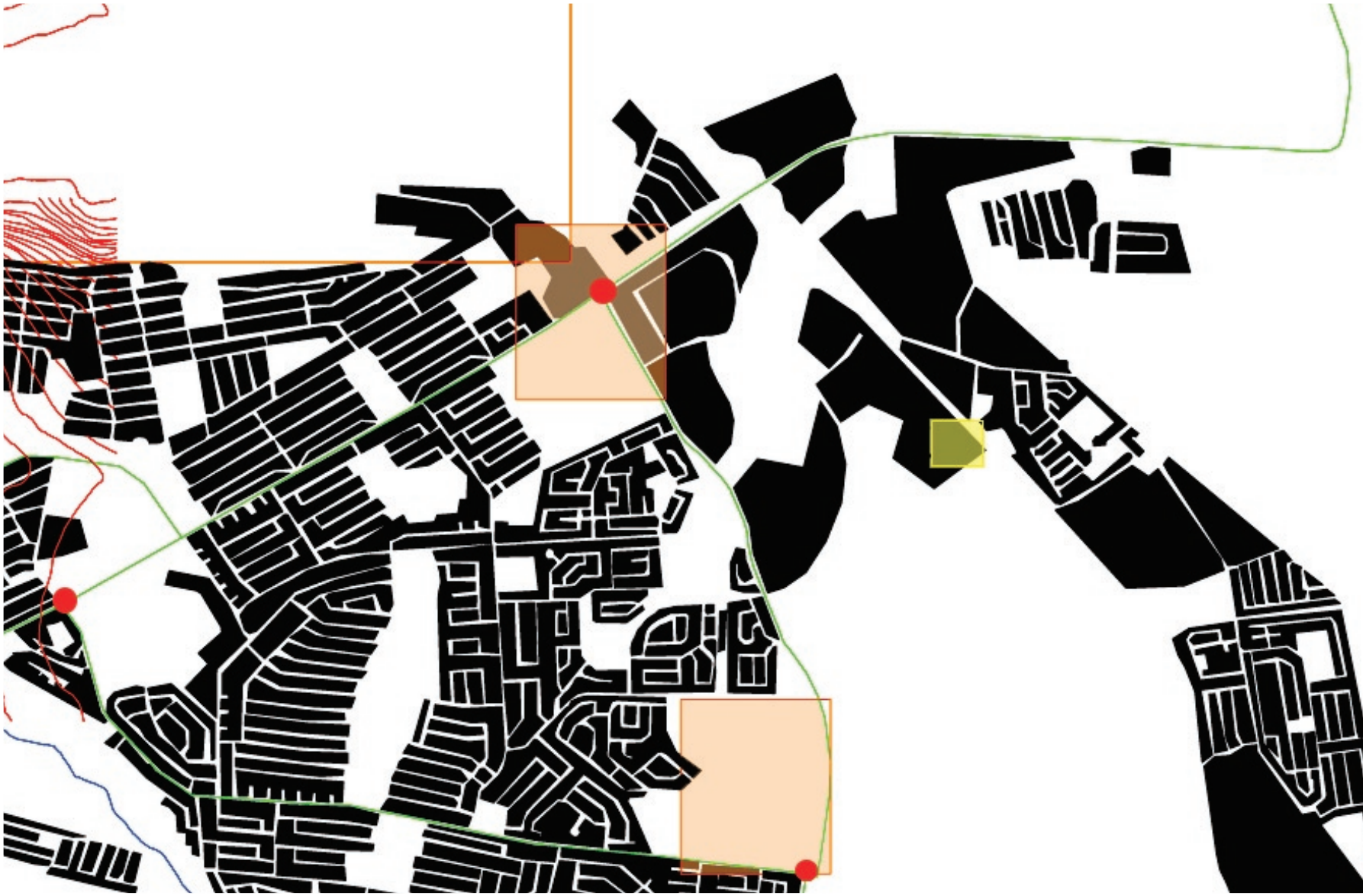


Fig51a: Yellow represents Heritage Sites; orange urban nodes of places of interest; red points the position of beacons

The yellow square, top, centre indicates the position of the park



Precedent Studies:
Red Rock Amphitheatre

Being carved out of solid rock in a natural amphitheatre, this facility is a dramatic setting for any performance. Its stage is simply a concrete platform on which the necessary props are erected. This makes for a very flexible performance space where a wide variety of different shows can all be hosted. It is situated in a nature reserve.

The flexibility the design of the amphitheatre permits is perfectly suited to the situation in Moretele Park. The entire seating area is open air, circulation is restricted to side aisles and there is a platform provided about 10m from the stage to accommodate the sound control booth. For most of the year, the amphitheatre is no more than a little intrusive landscape feature, but when large shows are staged, the area can easily and successfully be converted to accommodate hundreds of spectators.



Fig52: Red Rock Ridge Amphitheater



Fig53: Seating detail

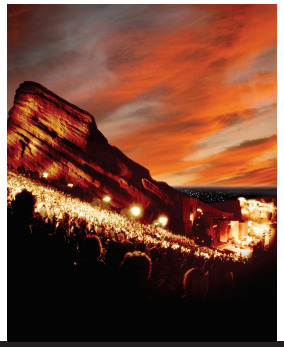


Fig54: A capacity crowd at a concert

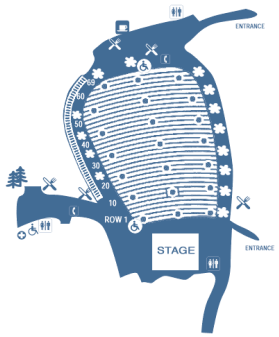


Fig55: Layout of the Amphitheatre

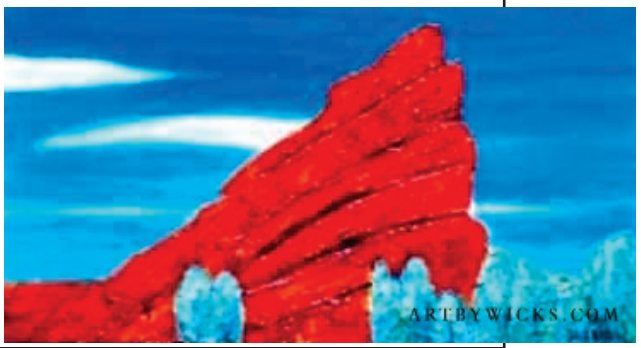


Fig56: Promotional image for the facility



Precendent Studies: Red Rock Ridge

Fig57: Union buildings terraced formal gardens



Fig58: Mixed stairs and landscaping



Fig59: Colonial memorabilia

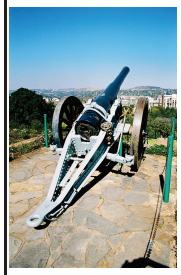


Fig60: View of the buildings from the gardens





Union Buildings

Herbert Baker's most celebrated building is a major tourist destination, the office of the president and the location of many public gatherings. This building is an applicable precedent because it is an example of how the southern slopes of the local mountains (similar to the Magaliesberg in geology) can be dealt with as an integral part of a public building.

"The terraces and retainer walls in the grounds are built predominantly of mountain stone quarried on site." This exercise can easily be repeated in Moretele Park and stone quarried on site can be used elsewhere throughout the park as landscaping. Shale quarried on site will be used to build retainer walls to stabilise the slope. These will be provided with gravel drains behind as illustrated in the details in the final drawings.

Fig61: Movement through the gardens allows the experience of vrious methods of dealing with slope stability



Union Buildings

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Andersses House by Norman Eaton

Eaton's house in Pretoria demonstrates how local materials can be combined with contemporary technologies to create an architecture that seems to belong. Its linear arrangement also responds elegantly to the requirements passive design and programme. The East West orientation allows all services to be neatly grouped along the southern façade, an elegant solution which allows maximum opening of the other three sides.

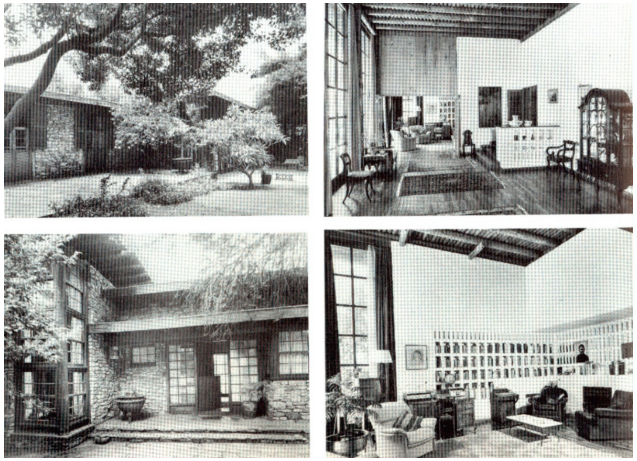


Fig62: Various views of the house

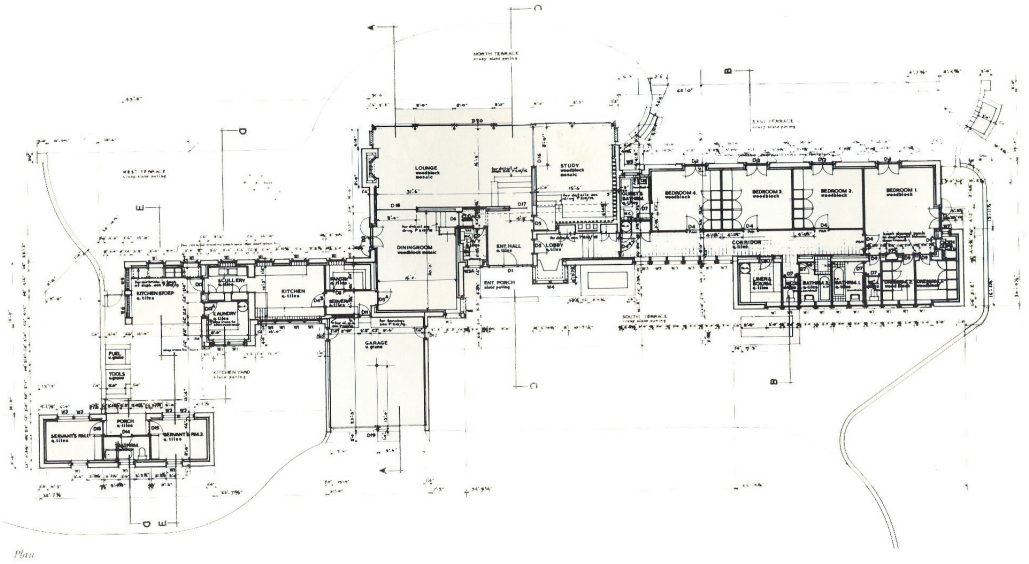
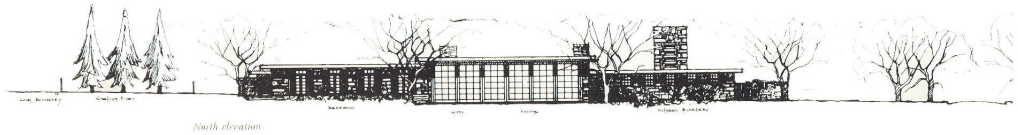


Fig63: House plans clearly demonstrate the east west liear arrangement, allowing a building that opens to the north and is fully seviced from the south



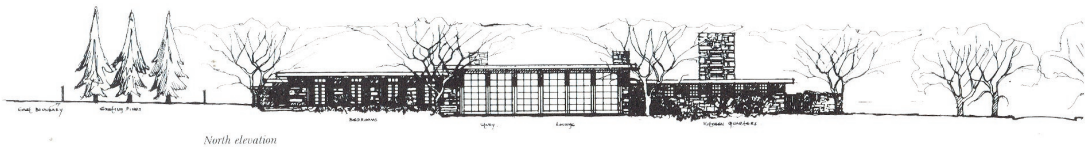




Fig64: Elevations illustrate the simple geometry of the building



Anderssen House in Pretoria

Fig65: Aerial view over Freedom Park



Fig66: The Freedom Park project under construction

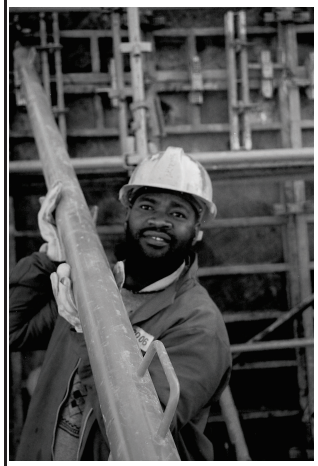


Fig67: Monumental scale casting of concrete





Freedom Park

Nelson Mandela made a speech on Freedom Day in 1999 in which he is quoted as having said: “it is therefore a weakness on our part that we have yet to create a monument to remember them and all South Africans who sacrificed so that we should be free. With a recent cabinet decision on this matter, the day should not be far off, when we shall have a people’s shrine, a Freedom Park, where we shall honour with all the dignity they deserve, those who endured pain so we should experience the joy of freedom.”

Freedom Park is a monumental undertaking by the presidency currently under construction on a 52 Ha site on Salvokop which will become a symbol of the Freedom of all South Africans.

It is a complex and highly ambitious project whose aim is to celebrate freedom as a right deemed necessary for all South Africans. The main feature of the project is a massive wall upon which the names of fallen heroes will be placed. These heroes will be categorized according to 8 time periods on various portions of the wall.

All the materials used have been selected because of their beauty and durability, all the stone cladding being sourced in Mpumalanga. Construction is largely done in concrete which is than clad with a minimum of 75mm natural stone. Stone cladding is fixed to the structural walls by means of regularly spaced galvanised

steel plate strips built into the structure. Some structure is clay brick which has been clad in Mpumalanga stone. The design juxtaposes slick modern finishes such as aluminium and glass against raw stone and natural landscaping.
As far as possible, plants have been retained on site and all new plants are indigenous. The project is largely an exercise in low impact landscaping, and although unarguably effective, one mush question the logic of using materials from another province and some of the construction techniques employed. Other facilities will ultimately include:

A hospitality suite
A memorial
Sculptures

A museum
The Pan African Archives part of which is an interactive debate forum
A body of water
An administration block

Commercial facilities
Miscellaneous infrastructure



Fig68: CLadding is held onto the masonary wall with galvanised steel ties

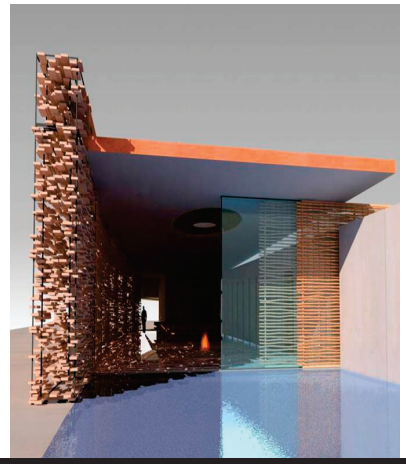




Fig69: Promotional image for Freedom Park

Fig70: Concrete structure yet to be treated aesthetically with stone cladding



Freedom Park

Theoretical Interpretation:

Townships in South Africa pose very interesting problems. They generally lie outside of the central business district (CBD) of city centres and are often situated on more than one side (Pretoria is surrounded by Shoshanguve, Mabopane, Atteridgeville, Ga-Rankua, Hammanskraal, Temba, Mamelodi, Eersterus, and Diepsloot.) They are among the most densely populated areas of our cities, they house the bulk of the city's people who were previously disadvantaged.(Stats SA; 2004) Although they are the least affluent of urban areas in the city, they are often characterized by a strong sense of community and are arguably among the safest areas to live. Children enliven the streets, trade takes place throughout (nullifying the concept of a CBD), poverty is often widespread and this leads to highly industrious initiatives by locals to generate their own economic solutions. It can of course be argued that this communal sense is disappearing, but the author would propose that this is a result of a shift in mindset away from communal Africa to a new capitalist society where it is each to their own. We have developed a false sense of separation and have begun to believe that we can exist alone.

On the other hand, there seems to be a stigma attached to life in the townships, with many residents aspiring to a more westernized form of lifestyle. Traditional construction techniques are often considered inferior and primitive, even if the alternative is an unliveable tin shack.



Fig71: An advert for Channel O; marketing directly appealing to status, image over quality



Theoretical Exploration

Suburbia is perceived as the greener grass on the other side.

Taking a cue from Europe, where problems of polarized wealth distribution and sharp differences between classes have long been a reality, some observations can be made:

“Many cities in Western Europe are confronted with poor economic performance (relative to the rest of the country or the metropolitan region), concentration of unemployment (especially of the long-term unemployed), traffic congestion and accessibility bottlenecks, environmental degradation (pollution of air, ground, and water), a deteriorating housing stock, crime and safety concerns, and concentrations of marginalized groups. These problems are often concentrated in specific parts of a city, notably those neighbourhoods that are the least attractive in terms of housing and other physical characteristics (such as: poor public spaces, proximity to polluting industries, large distance from important services).” (Andersen and van Kempen; 2003) A parallel can be seen here with South African townships and degenerated European suburbs.

“As a consequence, most cities have passed through a frenetic phase of functional transformation, particularly of their core and inner-city areas. Changes have however also affected suburban areas, especially large-scale post-WWII housing estates (as in France).” (Andersen and van Kempen; 2003) The urban



Fig72: Places for public gatherings often take the form of tents



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policies of Pretoria and Johannesburg aim to achieve similar effects, however, very little influence in exerted by these programmes in the townships. It is as if the new government has classified the townships as areas where they can have little or no impact. This only leads to further polarisation.

Policies with spatial objectives are arguably generated and guided by short term and misdirected objectives. Spatial quality in urban areas is envisaged when generating development frameworks, often without addressing the myriad causes for urban degeneration in the first place. This may be an effective strategy historically, but as stated by Andersen et al: “the functionalist approach to urban planning and housing development was… …popular in the 1960s and early 1970s, although that approach had been developed back in the 1930s. Functional planning can be seen as a kind of activity in which the goals and objectives are taken as given (as opposed to normative planning, where these goals and objectives are themselves the object of rational choice.)” (Andersen and van Kempen; 2003) The normative planning approach thus has the quality of life of the people as objective and special solutions come second to this.

“…functionalist planning belongs to the past, although many people still have to live in the physical results of this concept. In many, though not in all areas that have been built under this regime, the inhabitants suffer from such infrastructural problems as physical decay,



Fig73: Stone wall construction is highly decorative and innovative in some houses



rapid attrition, dereliction, low demand and abandonment of dwellings, in addition to anti-social behaviour, social and racial tensions and deteriorating housing services." (Andersen and van Kempen; 2003)

If a rift always remains between the rich and poor, little progress can be made toward improving the life of all South Africans. While the encouragement of inner-city urban regeneration by governing institutions has unquestionable benefits for the city, integrated planning rather than a regional approach could yield larger and more effective results that will be carried over into future generations. "This means that institutional economics is concerned with collective behaviour of people so that their decisions and actions could be modified collectively. As institutions are conceived as the rules, which facilitate and/or constrain human behaviour in the market process, institutionalism deals with institutional changes and individual behaviour in a broader social, political and economic context." (Omar and Yusof; 2002) This implies that policies that are to be used as development guidelines must be carefully formulated to address a broad range of issues that will ultimately have a positive impact on the man in the street. The city of Tshwane has an integrated development plan (IDP) which sets out guidelines for various governmental departments to follow with the aim of ensuring an integrated and holistic approach to urban planning (Tshwane IDP; 2006)



Fig74: Livestock is still put to pasture on the slopes of the mountains behind Mamelodi



The aim of this project in this context is to provide a public facility in Mamelodi, in line with the IDP which will enrich the immediate surrounds while challenging conventional norms of perception.


Fig75


Fig76


Fig77


Fig78


Fig79



Fig80



Fig81


Fig82

Selected scenes from around the township



Theoretical Exploration



Fig 83: A sprawling informal settlement can spring up in a matter of days



Social impact and waterfront development:

"One of the leading policy strategies of growing cities is to increase the density of the urban structure in order to advance sustainable development by minimizing investments in infrastructure, energy consumption and emissions from private car traffic. These urban densification processes have intensified the planning and building of waterfront areas near the city centres. Thus, the compaction strategies have provided environmental arguments to redevelop these sensitive areas, which were traditionally difficult and contradictory questions for policy makers." (Sairinen and Kumpulainen; 2006) Similar policies have been adopted by South African metropolitan municipalities as is the case in Johannesburg and Pretoria where tax exemption incentives are used to encourage private sector investment in selected urban areas. Development in townships, however, is not subject to any such initiatives and although there is a definite trend of development in these regions, this is largely fuelled by the private sector (with some exceptions.)

"Urban waterfront redevelopment as we know it today embodies the historic alteration of land and water uses along the edges of thousands of cities, large and small, throughout the world. Complex and multifaceted, current waterfront redevelopment trend is attributable to a number of factors, notably: (1) Technological changes post World War II, which led to

abandonment and/or deterioration of thousands of acres of industrial land across waterfronts, (2) The historic preservation movement, (3) Heightened environmental awareness and water cleanup, (4) Consistent pressure to redevelop central city areas, (5) Public (state, federal and municipal) urban renewal and related assistance." (Sairinen and Kumpulainen; 2006) The proposed waterfront development will have both a recreational and entertainment function and as a public park, should be as accessible as possible. Also, it should be noted than water is the one universal symbol associated with various religious practices throughout South Africa and as such has an intrinsic quality that appeals to almost all people. Water has long been a symbol of life and purity. Although European waterfront development is often commercial and the result of trade requirements this particular case is concerned with the recreational potential of a waters edge facility.



Fig 84: Panoramis view over the park, the avenue of trees can clearly be seen





Fig 85: Hand painted "mkukus" or shacks like this salon create a colourful street



Approach to Urban Space and urban theory:

Various definitions to space and spatial theory give sometimes conflicting interpretations about what space is and how it is to be understood although it must be acknowledged that space has never been more than a human idea and is bound in the west to the interpretation of space-time. (Madanipour; 6-7) Many African cultures have interpreted time as an abstract concept that cannot exist without intervention from man; time is made, it does not just happen. Contemporary quantum theory seems to support this concept. (Capra; 94) Tshumi reminisces that there are two approaches "in defining space: the first is to "make space distinct"… …and the second is "to state the precise nature of space."" (Madanipour; 6-7)

The construction of any building or architectural entity "functions in the creation of two kinds of spaces: its internal space, completely defined by the building itself; and its external or urban space." (Madanipour; 8)

An argument has been taking place since the first days of architecture over what space is and how it is to be defined: does architecture mean the definition of internal space or does it mean the resultant spatial experience as the result of fulfilling a desired programme? (Madanipour; 10) It is the dichotomy between form and function, the result of whose conflict gives rise to architecture. This exercise will explore

Theoretical Exploration

the relationships between these two concepts (or some form of them) and the resultant experiences which are possible. Public space is necessarily inclusive and thus not usually defined as enclosure. How can spaces be both public and intimate? A systemic approach results in architecture. It is not enough to say that space can be interpreted as an environmental function, nor a social phenomenon. Rather than depart from a notion of what architecture should be, architecture manifests as a series of processes which overlap and are then interpreted in relation to one another. The interpretation allows art to live, while the rational overlaying of feedback systems informs the interpretation.

As Frank Lloyd Wright said "…architecture which is really architecture proceeds from the ground and somehow the terrain, the native industrial conditions, the nature of materials and the purpose of the building, must inevitably determine the form and character of any good building." (Wright; 86)



Fig 86: Children are always to be found in the streets of Mamelodi. This entrance to an informal compound funnels quickly into legibly private space





Fig 87: Early housing developments clealy show a grid logic, something that organically disappeared in Mamelodi's development



Social Impact assessment:

Resources and identity

According to Sairinen and Kumpulainen the social dimensions of urban planning can be investigated in the following format:

– Main characteristics and strengths of the area:

The area lies approximately 20 km east of the city centre, it has an estimated population of 1.3 million (Stats SA; 2004). Mamelodi has a history of freedom struggle, education and music. Physically, it is a very picturesque area, bisected into east and west by the Pienaars River and further fragmented by various perennial streams (the largest being the Moretele Spruit.

– Opinions of the environmental, cultural or historic values:

The Magaliesberg Mountains behind Mamelodi have long been the home of indigenous people, but today there is more than one group with a vested interest in the mountains. Informal settlers have begun to build their homes ever closer to the top of the mountains, while groups of initiates use the mountains once a year for their initiation school. Historically the mountains house no significant archaeological sites; all that remains of Chief Mogale's legacy is the name that the mountain range bears.

– Significance to the visual, social, and cultural identity (city image, community identity)

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The Magaliesberg Mountain range is the most prominent geological feature of the Pretoria area, having bounded the development of the city to the North from early days. The site for the Transvaal Republic's capital was selected because of its defensibility from the many "koppies" which surround it. Mamelodi lies below one mountain and this feature dominates the setting. During ritual initiation, fires can be seen burning on the highest ridge.

The mountain was also the site of many a skirmish during some of the wars which took place in the region.

Mamelodi's current residents are an eclectic mix of cultures with a strong history of freedom struggle and a traditionally strong community identity. Locals say that it is easy to tell if someone is from "Mams" because they have a distinctive dialect which is easily recognizable.

The river lies somewhat off the beaten path, out of the way at the base of the mountain and is used largely by urban farmers and informal settlers. In the park, the river divides the mountain and the park lawns and allows "tsotsis" to make the slopes their home.

The proposed intervention seeks to bridge this river. An interview with a long time resident, Andrew Saskdjf, revealed that Mamelodi has a history of gangsterism and that thugs traditionally met at a cluster of trees, "Fyfboom" until residents took it upon themselves to drive



Fig 88: Mamelodi housed a British military graveyard during the Anglo-Boer wars



Theoretical Exploration

them out of the area. It is hoped that the effect of a bridge over the river will result in similar result for the mountainside.

Social status

– For whom (social, age or ethnic groups) are the housing and service areas planned and built?

The park will cater for the residents of Mamelodi, children, students, adults and the elderly. Recreation facilities already in place allow for swimming, braais and sport. New facilities will include shelter, food and a tourism and heritage component. The provision of a cafeteria and restaurant will further allow for gatherings and meetings.

– Segregation and/or gentrification processes

Being a recreational area, the park will be fully accessible and provide a base for the expansion of tourism in the immediate area. There will, of course, be no criteria to allow certain users and deny others access.

Access and activities

– Are the waterfront areas accessible to the public?

The waterfront area will be differentiated into various functions, mainly recreational and for reflection. Public access will be possible through the park where a security control will ensure the safety of visitors. This facility is already in place and will continue as it currently functions.



Fig89: he youth are the most likely users of the new park facilities



– What kinds of activities are possible?

The nature of the river does not allow for many functions other than recreation. Swimming will be restricted to formal facilities. Pollution of the river is a serious concern which will have to be dealt with in conjunction with the community. Livestock which currently uses some parts of the park will not be discouraged, but conditions such as permissible times will need to be revised.

Water dependency

– Easy or difficult approach to waterfront?

The waterfront is easily accessible on foot from the gate of the park and will remain so. Beacons placed throughout the township will facilitate navigation at street level from a vehicle or on foot.

– Traffic and parking questions; waterfront routes

Since the stretch of waterfront under investigation lies within the boundary of a restricted access area, traffic issues are not applicable. Parking facilities will be sized according to the projected number of visitors for formal functions. The majority of visitors are expected to be local residents who arrive by public transport or on foot.

Waterfront experience

– Presence of water (sea, lake, river, etc.)

The river has long been enjoyed by people



Fig 90: The river gets quite stagnant and polluted during the dry months. The pollution problem can only be addressed at a social level and by encouraging lifestyle changes



as either a source of fresh water, irrigation or for various recreational uses. Although some parts of the river bank will need to be stabilised for structural purposes, it is proposed that rehabilitation of as much of the bank within the park as possible takes place and that a clean up be staged to rid the river of pollution.

- Restorative experiences, importance of visual messages, physical touch, tastes, voices, moving in the space, sense of transition as identification

With extensive intervention, the riverfront could become a popular and beautiful area for relaxation, reflection and even rejuvenation.



Fig 91: Festivals draw large lively crowds who congest every available corner of the park



Theoretical Exploration

Mamelodi Heritage Route:

The city of Tshwane has proposed a number of heritage routes through the city as a part of its branding exercise. These routes are categorised into a number of themes, being Conservation city; Garden city; Knowledge and industry; Park Route and finally, the category applicable to Mamelodi: Struggle and Freedom. (Tourism Brochure; 2006)

The greater proposed route begins and ends in the city centre; however, Mamelodi has its own small circuit. This route begins at the entrance to Mamelodi, the intersection between Soutpansberg Road and Waltloo Street, the position of Solomon Mahlangu Square and a community amphitheatre, a fenced in concrete structure. Solomon Mahlangu was an ANC cadre who was hanged by the state for the part he played in the freedom struggle. A statue by Angus Young commemorates his memory in Solomon Mahlangu Square.

From here, the route leads North West to the cemetery, final resting place for numerous struggle heroes including Solomon Mahlangu. Further north, the Magaliesberg Mountains were “the site of many skirmishes between cadres and the South African Police (SAP)”. (Tourism Brochure; 2006) Moretele Park lies at the base of these mountains and there is a picturesque gorge cutting through the hills cut by the Pienaars River. This gorge is easily accessible from the street and houses a bridge


Fig92


Fig93


Fig94


Fig95


Fig96


Fig97


Fig98


Fig99



Fig100

Fig 92: Walled houses along the street

Fig 93: The house of Dr Nico Smit, the roof is a geodesic dome

Fig 94: A temporary structure in the park

Fig 95: School children walk along main roads at lunch time and after school

Fig 96: Former hostels now occupied by illegal squatters

Fig 97: A typical spaza shop

Fig 98: The original shopping complex in Mamelodi

Fig 99: The house of Dr Fabien Ribiero

Fig 100: Most major intersections have become commercial nodes



Heritage Route

Fig 101: The structure of the existing amphitheatre can be seen in the background

Fig 102: Solomon Mahlangu

Fig 103: Tsamaya Station; the public transport hub

Fig 104: Trade around Mamelodi

Fig 105: Entrance to the hostels

Fig 106: Containers used as an extension to a house

Fig 107: More affluent citizens built typical suburban homes

Fig 108: The existing community hall sees little or no activity through the year

Fig 109: The water slide behind the playground





















over the river. There are cliffs, caves and many a secluded spot down the gorge. It is suggested that access by footpaths to the gorge from the park be made. Potential activities in the gorge include swimming, rock climbing and picnicking to name but a few.

H.M. Pitje Stadium served as the venue for many events during the struggle era and also housed “various mass meetings called by the Mamelodi Civic Association during the struggle era. It is currently being upgraded to the tune of R10m and there are reports (Sunday Times; Soccer Life; 07/10/2006) that business tycoon and mining magnate, Mamelodi Sundowns’ owner, Patrice Motsepe has ambitions to build a bigger state of the art stadium here for his team. The stadium will be used as a training facility for visiting international teams in the upcoming soccer World Cup.

East from here lies the Community Hall, Balebogeng Centre and the Old Beer Hall (the first structure in Mamelodi to have electricity).

Further along the route, the houses of two prominent white citizens of Mamelodi can be found: those of Dr. Fabian Ribiero, :”the peoples doctor” and that of Dr. Nico Smit a minister of the Dutch Reformed Church.

Moretele Park lies just north of this point. Further away, in Mandela Village, the Johannes Maisha Stanza Bopape Memorial can be found. Stanza

disappeared one night and his body was never recovered. He was reportedly murdered by apartheid police and his body allegedly dumped in the Komati River. (Tourism Brochure; 2006)

Mamelodi Tourism Proposal:

A government committee has been reviewing the state of Mamelodi and commissioned an independent tourism company to propose a tourism plan for the township. The plan centres around the concept of empowerment of local stakeholders: tavern owners, guest houses and shebeens among them.

Conceptually modelled on the Soweto tourism model, the tourism plan seeks to make certain fundamental changes. Mamelodi is to be regarded as a destination, rather than as a stop off as part of a larger tour. This approach seeks to ensure direct economic results in the township. The case in Soweto has been largely criticised because tourists both begin and end tours in Sandton meaning little of no economic effect in the township. The Soweto tours are experienced through bus or car windows and very little is actually bought. Some shebeens and recreation facilities are connected with these tours, giving them clear advantage over competitors. In terms of provision of tourism facilities, restoration has been proposed for some sites, such as the Mamelodi Rondavels, while upgrades of existing infrastructure has ben proposed elsewhere.



Fig 110: Rondavels on the farm from early years



Tourism Proposal

Fig 111: The logo for the Earth Summit





The process is ongoing. As a guideline for this project, the concept of Mamelodi as a destination has played a central role in programme development and informing design decisions. (Mamelodi Tourism Development Project; 2006)

Applicable legislation:

Based on information from the Gauteng Tourism: Responsible-Tourism Manual
Since the 1992 Rio Earth Summit, South African economic policy has embraced the “essential tenet of the ‘triple bottom line’”, guidelines for sustainable practice based on social, economic and environmental criteria. Where previous practice focussed on environmental issues, the contemporary approach has “shifted to place more emphasis on poverty alleviation and other important socio-economic aspects of sustainable development.” (Gauteng Tourism: Responsible-Tourism Manual; p4) The guiding principles of this are articulated in South Africa’s *White Paper on the Development and Promotion of Tourism (1996)*(Gauteng Tourism: Responsible-Tourism Manual; p4) Statistics show that this trend of basing development on the “triple bottom line” is appreciated by tourism patrons. As many as 95% of tourists feel that resorts that show respect to the way of living of locals is the most important criteria for them when booking a holiday. (Gauteng Tourism: Responsible-Tourism Manual; p4)

Legislation

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The guidelines of the Gauteng Tourism: Responsible-Tourism Manual prioritises:

- Protection of the environment
- Respect for local culture
- Provision of measurable benefits to local communities
- Conservation of natural resources
- Minimising pollution

These principles have been considered in concepualising an appropriate intervention for Moretele Park.

Institutional Framework

The Municipal Systems Act, 2000 determines that a municipality must adopt a framework for integrated development in its area in the form of an Integrated Development Plan (IDP) (Section 27).

A Spatial Development Framework, which guides and informs all development, forms part of the IDP (Section 35 (2)).

The Gauteng Planning and Development Act, 2003 determines that municipalities must formulate spatial development frameworks for their areas (Section 31 and 32).

An overview of the SDF is been shown on the following pages. The development of the park as an entertainment and recreation area within a nature reserve falls in line with existing requirements

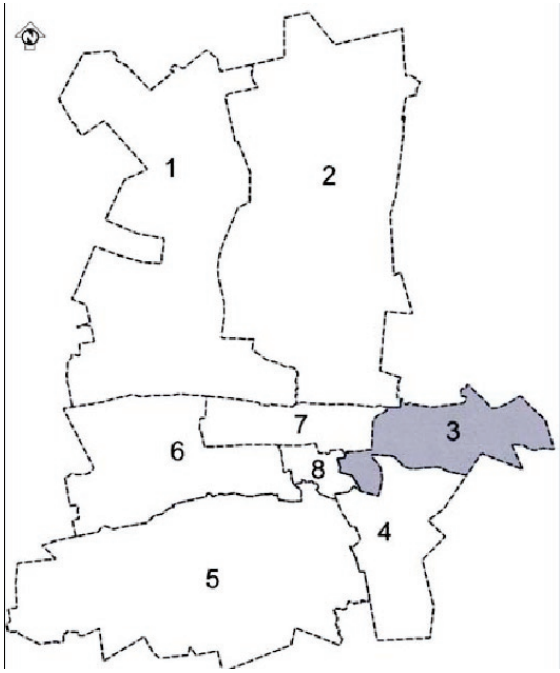
Fig 112: CTMM logo

CITY OF TSHWANE
"we are the same"



Institutional Framework

Fig 113: Administrative regions of Tshwane





In order to understand the context of the area and gain some insight as to what is envisioned here by the government, it is useful to examine the nature and content of the Spatial Development Framework (SDF).

An SDF must:

Indicate where public and private development infrastructure investment should take place.

Indicate desired development and land use patterns for different areas.

Indicate where development of particular land uses should be discouraged or restricted.

Provide broad indication of the areas where priority spending should take place.

Shall provide guidelines for development and land use decision making by the municipality

Mamelodi falls into Region 3 which is situated east of the Tshwane CBD with portions on both sides of the N1 Highway. Most significantly the eastern part which comprises the largest section of the region includes the lower income areas of Mamelodi and Eersterus, as well as the industrial areas of Silverton and Waltloo. The smaller western part of the region includes Hatfield and other higher income areas. It is regionally accessible via:

The N1 freeway which runs north south along its western boundary of
the northern part and links the City of Tshwane with the Limpopo Province in the north and Johannesburg, Bloemfontein and Cape Town towards the south;

Institutional Framework

The N4 freeway, which links the region with the Mpumalanga Province to the east, which forms part of the Maputu/ Walvis Bay Corridor.

The region is therefore accessible from a regional point of view as it is served by both north-south and east-west first order roads linking it to the rest of Gauteng and the broader region.

2.3 Metropolitan Characteristics

The main regional characteristics of Region 3 are:

It consists of two distinct urban areas namely:

A large northeastern section (Mamelodi, Eersterus, Nellmapius, Silverton, Eastlynne, Murrayfield, La Montagne, Meyerspark etc.) .

A smaller southwestern section (Hatfield, Hillcrest, Colbyn, Lynnwood and Menlopark).

The northeastern section of the region accommodates mostly low-income communities and industrial land uses.

The southwestern section of the region accommodates medium to high income areas with large institutional uses.

The region includes a number of strategically located undeveloped areas in terms of accessibility and infrastructure which offer significant development potential.

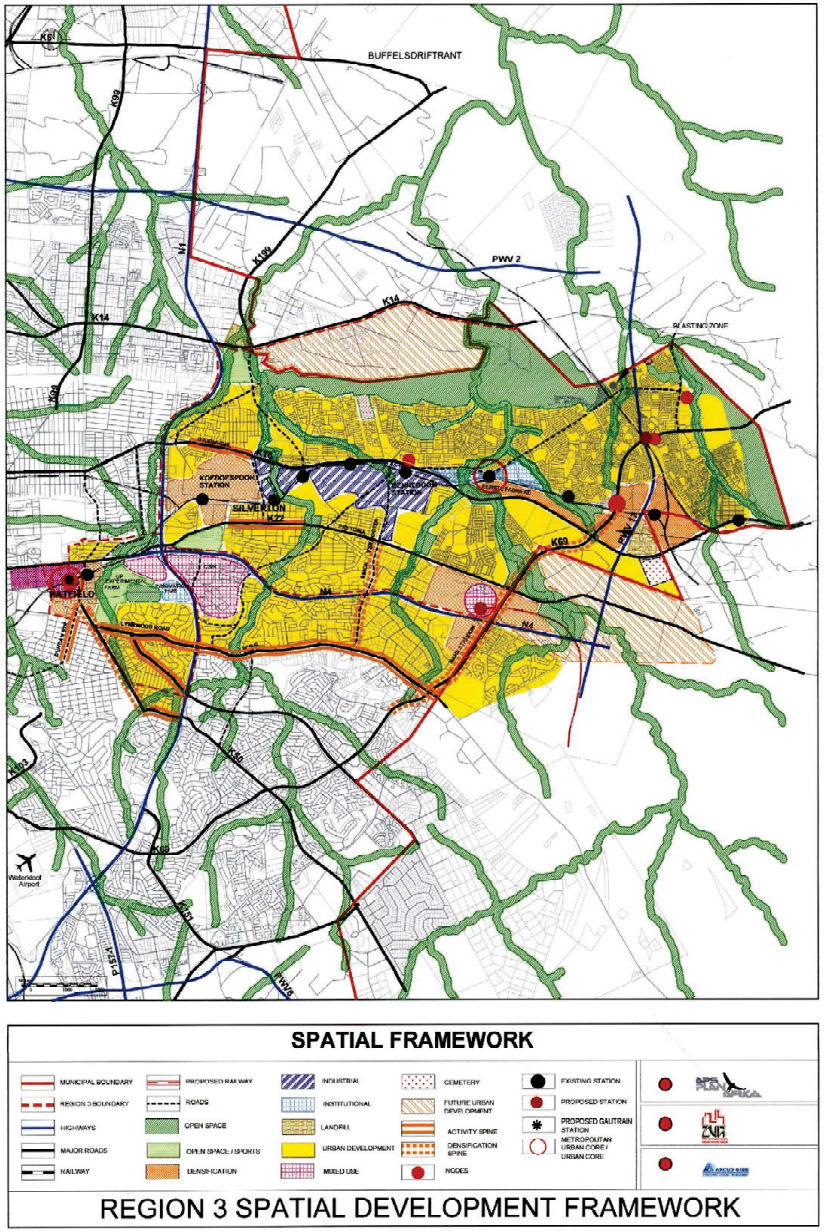
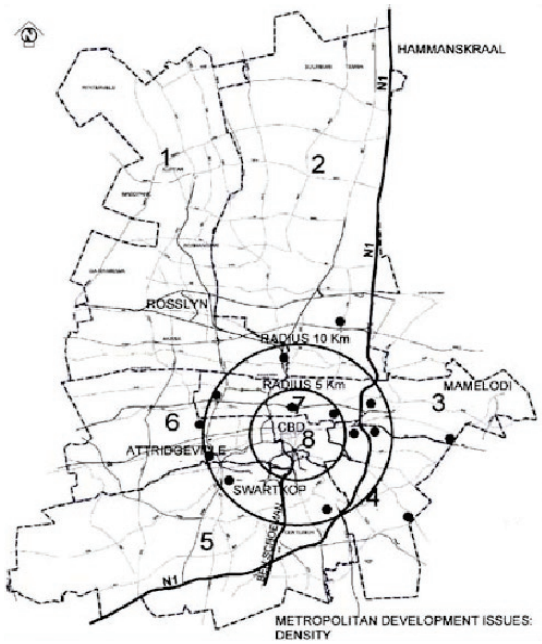


Fig 114: Spatial Development Framework for Region 3 in Tshwane



Area Characteristics

Fig 115: Concentraion of economic activities in the CBD mean much commuting





Interested parties:

Local stakeholders include business owners, craftsmen and entrepreneurs. Anyone, in fact, hoping to generate an income in Mamelodi without having to commute to traditional work areas should be considered a stakeholder in the tourism plan.

Long Term Vision:

The long term vision for Mamelodi is being formulated around the concepts of the brand of Mamelodi as the home of South African jazz and a major site of the Freedom Struggle against apartheid, a sustainable and viable economic plan and a plan for economic monitoring to ensure future growth. The main challenges in Mamelodi are similar to those in many other townships around the country: escalating crime levels, a move away from community coherence, lack of employment, poor standards of and difficult access to education and lack of public transport (compounded by the fact that South Africa has generous stretches of land between formal activities.)

The vision for Mamelodi is that is becomes an independant area of the city with a powerful economy based on tourism, industry and craft. A place where a sense of community and inclusivity can be rekindled. When people look after one another, rather than themselves, dysfunction is rarely tolerated.

Vision

Rationale:

If Mamelodi is to succeed as a tourist destination, something must be done about its poor legibility. Tourists, already intimidated by the reputation of South Africa as a crime hotspot, will surely be dissuaded from going into a township if there is a distinct possibility of getting lost.

Moretele Park:

The music festivals in Moretele Park are often chaotic affairs with at least 100 000 people attending twice a year. For the rest of the year, however, the park caters mainly for a small number of recreational users and is very spacious.

The two streams running through the park flood annually, making keeping the river tidy very difficult and also making building below the flood line irresponsible if not carefully handled.

By creating an amphitheatre which is shaped by the existing topography, the event can gain a certain level of formalisation without dramatic impact on the environment. Access to amphitheatre would necessitate a bridge over the river and would thus give access to the slopes of the mountain to park users.



Fig 116: Large crowds can easily fill the expansive lawns of the park



Rationale



Fig 117: Indigenous trees on the mountain



Fig 118: A wide variety of grass species can be found on the mountain slopes



By taking advantage of the elevation that is gained by climbing the mountain, it is possible to view almost the entire township. As illustrated earlier, various heritage sites throughout the township are being investigated as stops on a potential heritage route. The street layout and a lack of distinguishable hierarchy, however, make the streets quite illegible and thus daunting for the tourist to explore. Beacons which replace street lights outside the various heritage sites provide a possible solution to the legibility as well as provide landmarks that can be viewed from the lookout platform.

“The Eye of Mogale” is envisaged as a lookout point at the base of the cliffs, high up on the mountain, visible from most places in the township, however, there is a legal act that prevents development on the slopes. A lookout point can be provided at the top of the seating area of the amphitheatre which provides good elevation. this platform can double as a position for recording performances. Beacons replacing street lights at heritage sites will be proposed for a dual purpose: that of navigation form site to site at street level and for viewing from the “eye”.

Rationale

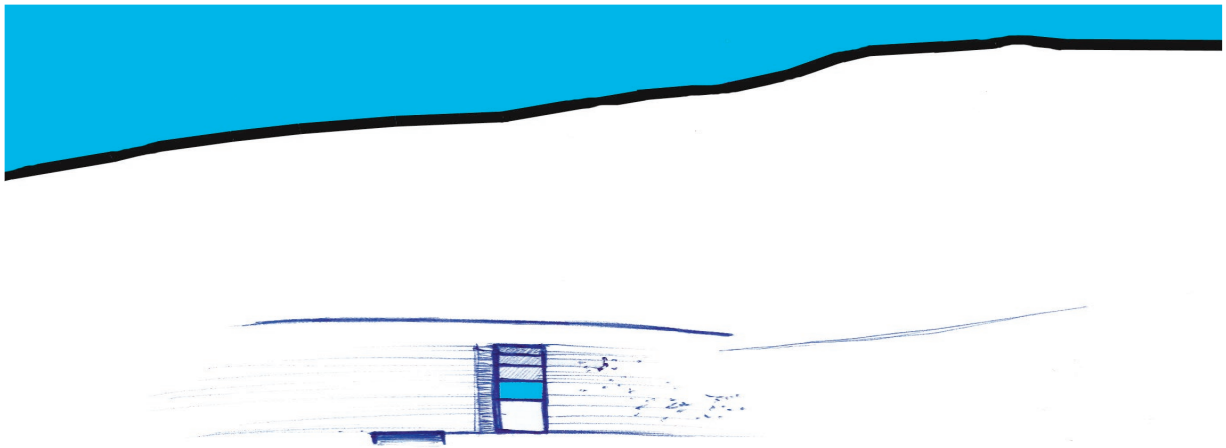


Fig 119: Conceptual form of intervention against mountainside

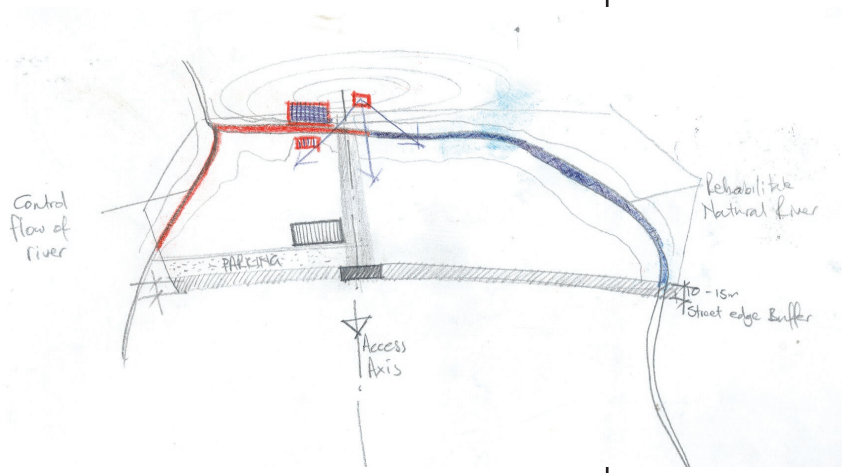


Fig 120: Conceptual spatial arrangement of functions within park

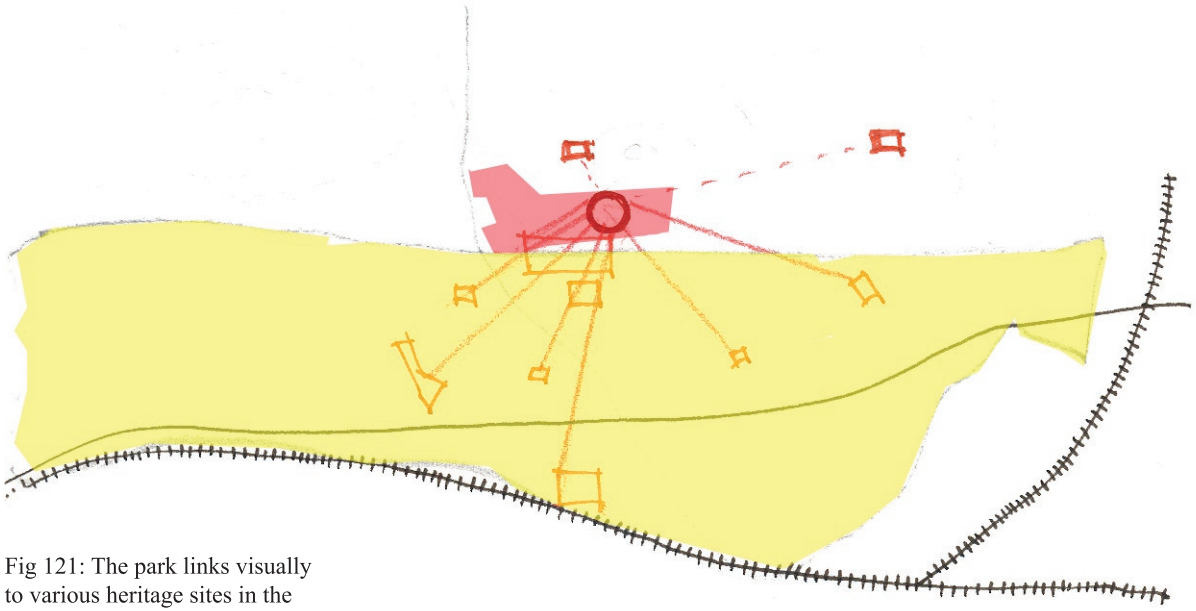


Fig 121: The park links visually to various heritage sites in the township

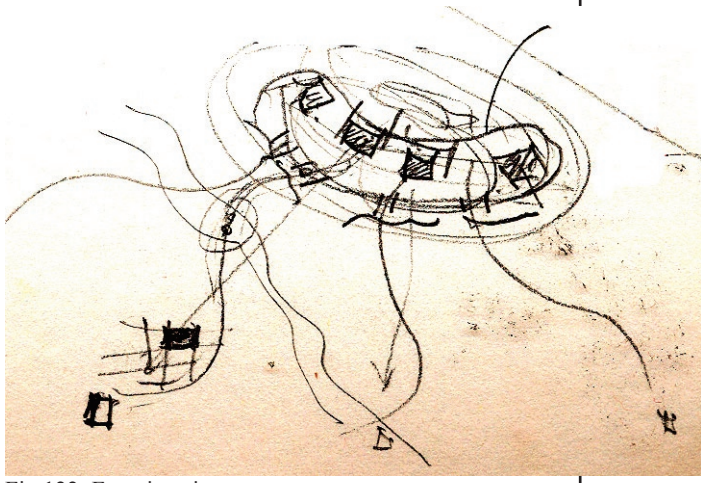


Fig 122: Functions in the park relate to the slope of the mountain



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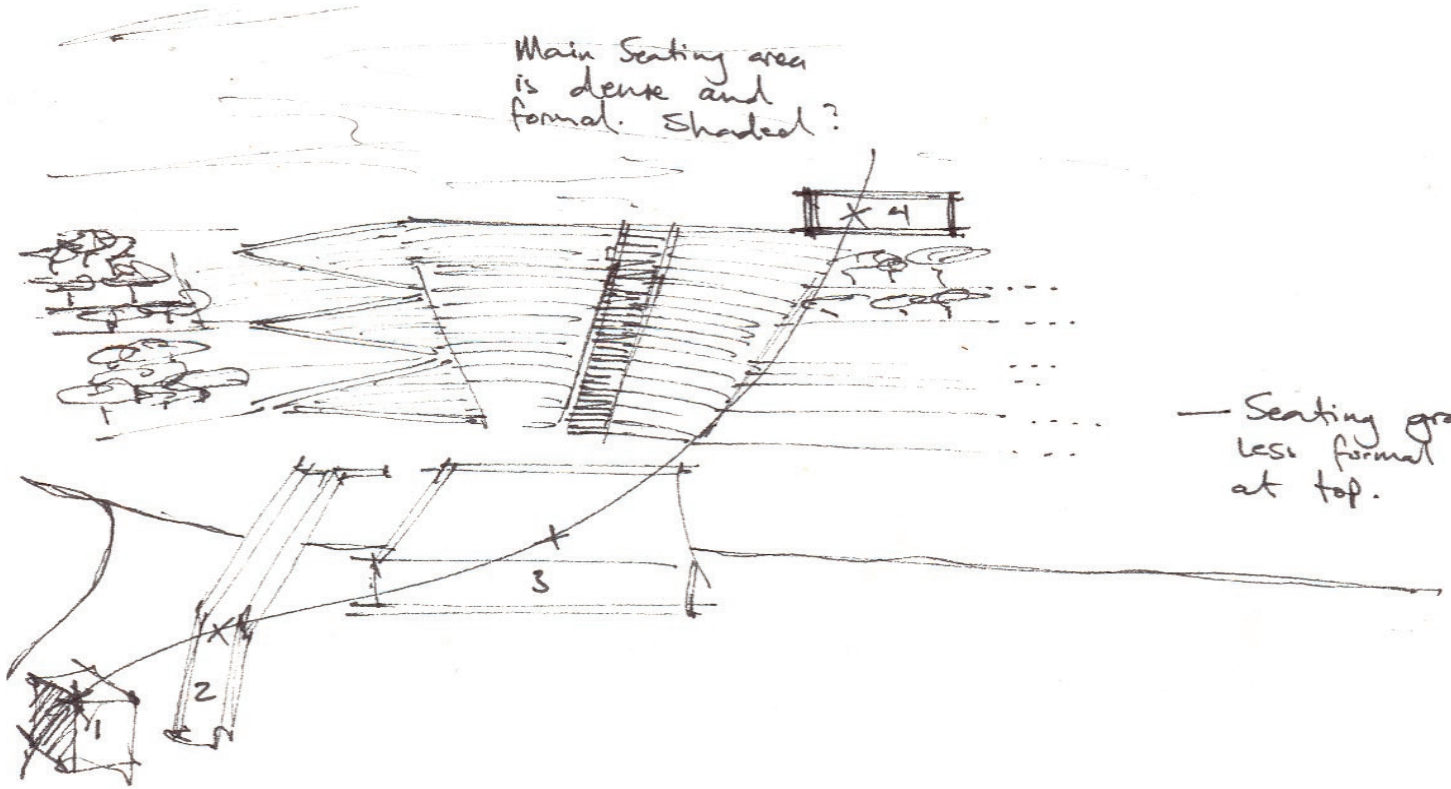


Fig 123: Four basic elements comprise the intervention:
1: Reception and shelter building
2: Bridge over the Pienaars River
3: Stage and amphi-theatre
4: Lookout platform

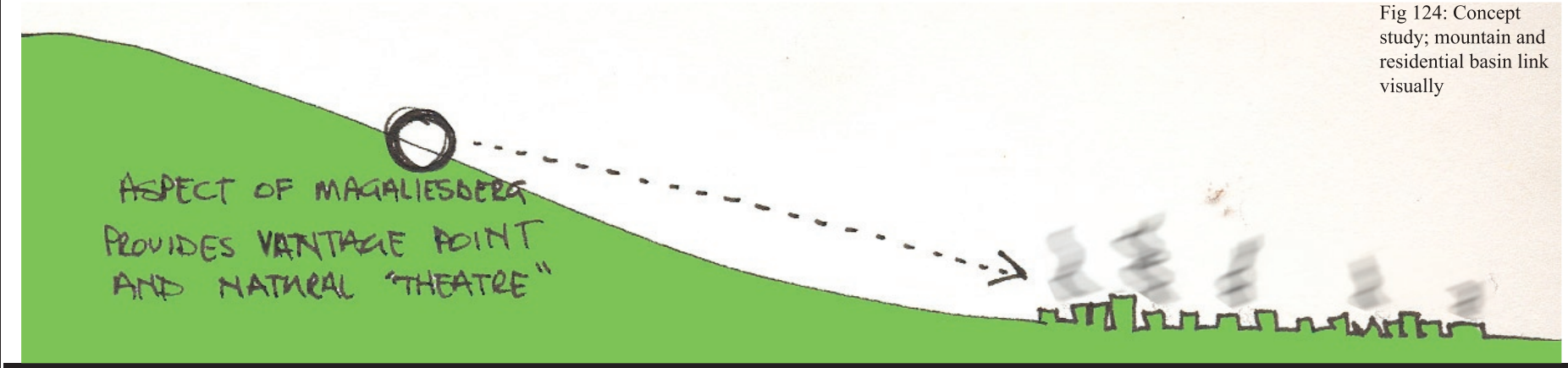


Fig 124: Concept study; mountain and residential basin link visually



Fig 125: Activities are concentrated between the entrance and the amphitheatre

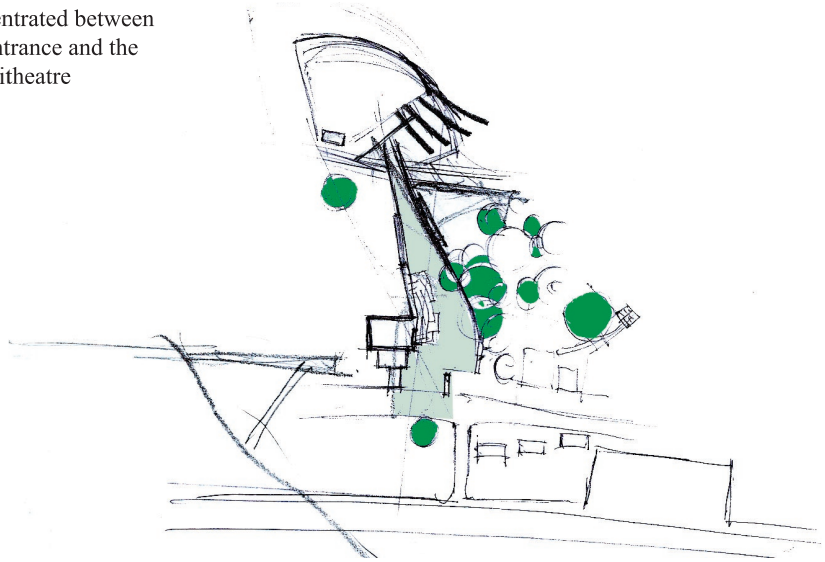


Fig 126: The shelter area open up into the lawned areas to the west and the sunset behind the mountain

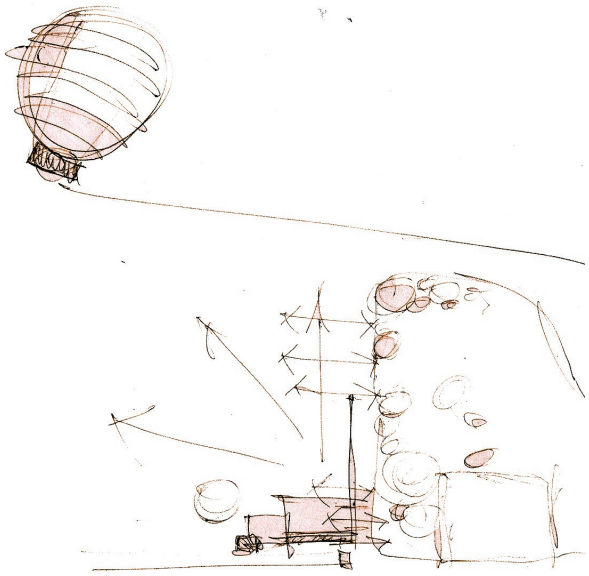
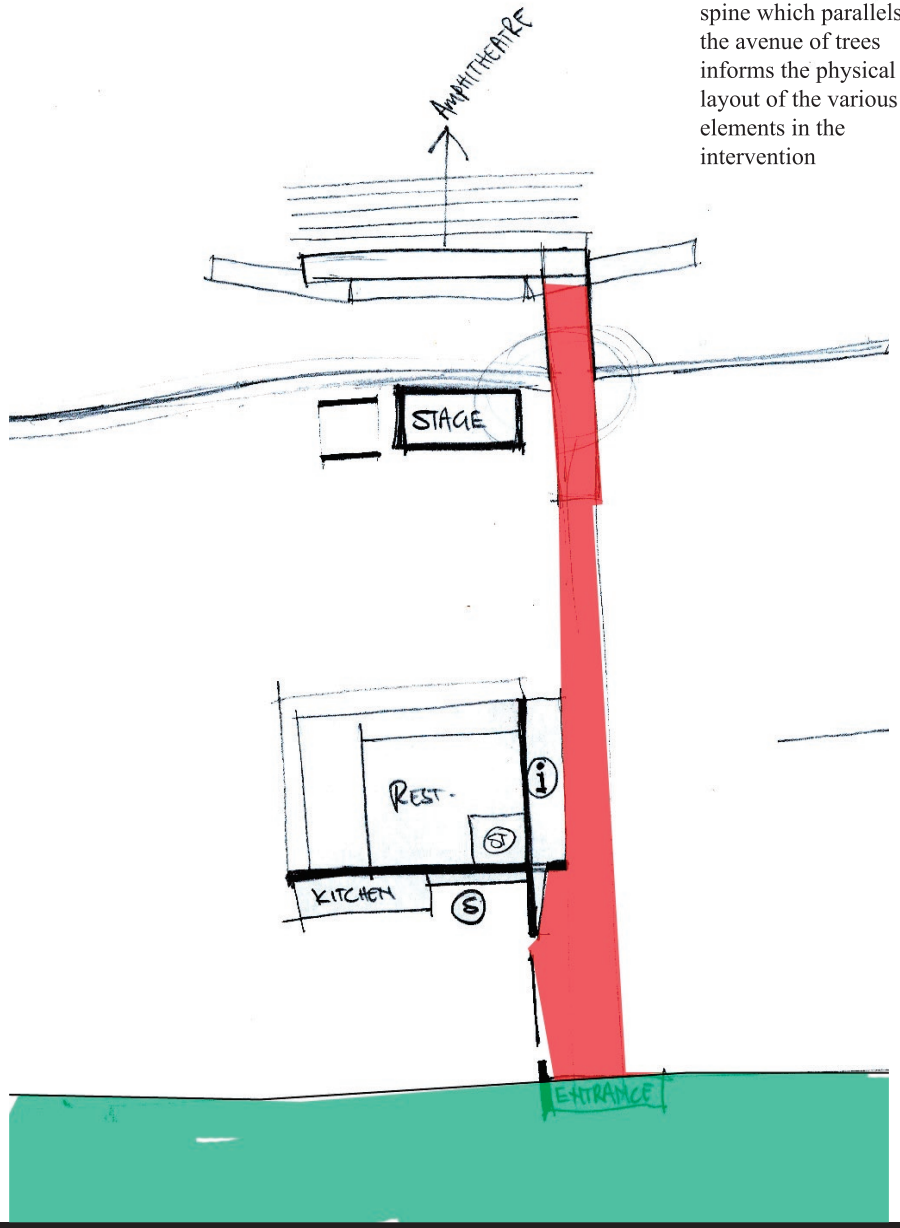


Fig 126: An activity spine which parallels the avenue of trees informs the physical layout of the various elements in the intervention





Design Process

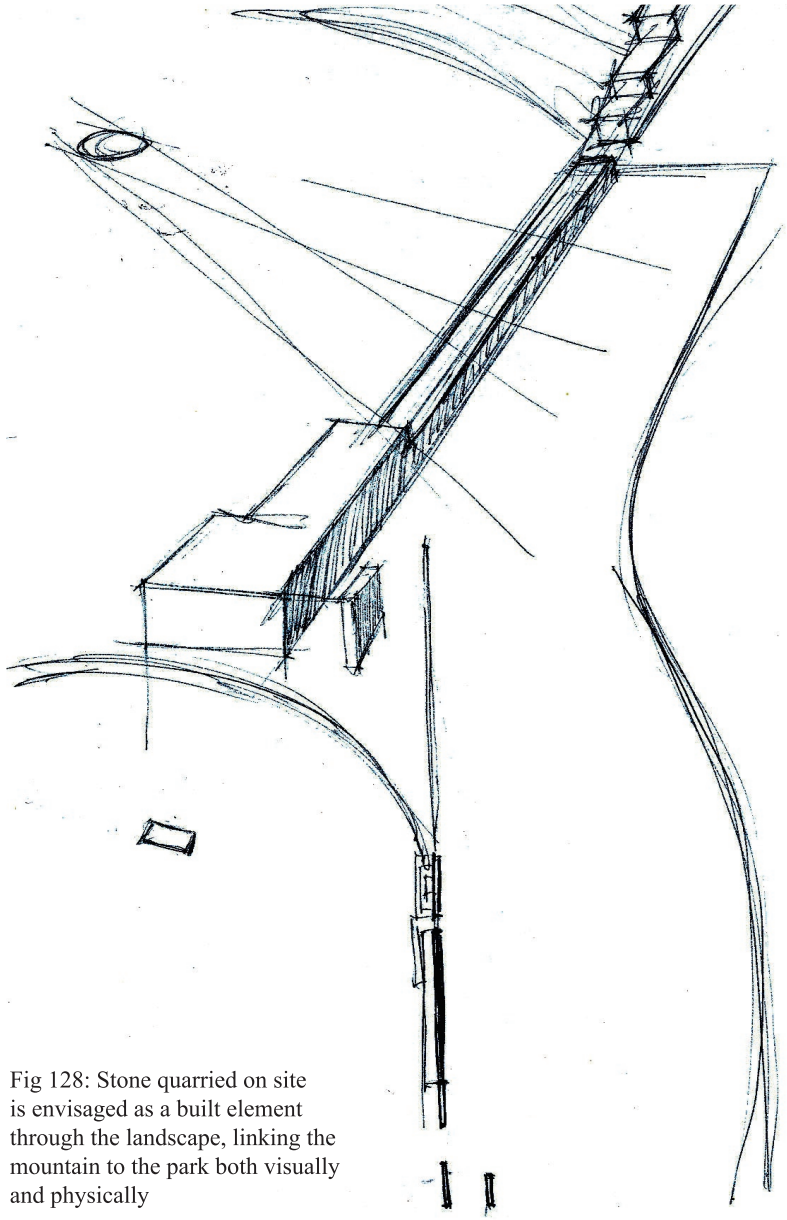


Fig 128: Stone quarried on site is envisaged as a built element through the landscape, linking the mountain to the park both visually and physically

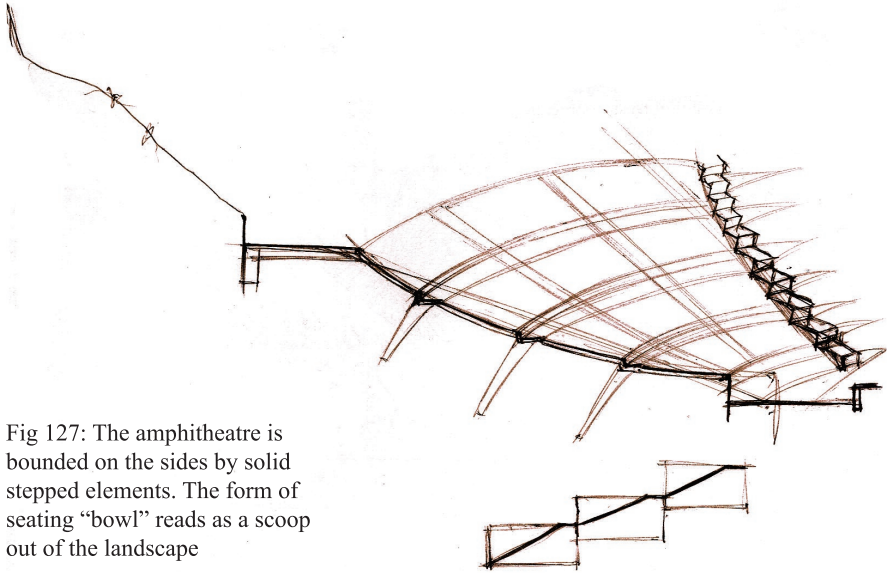


Fig 127: The amphitheatre is bounded on the sides by solid stepped elements. The form of seating "bowl" reads as a scoop out of the landscape

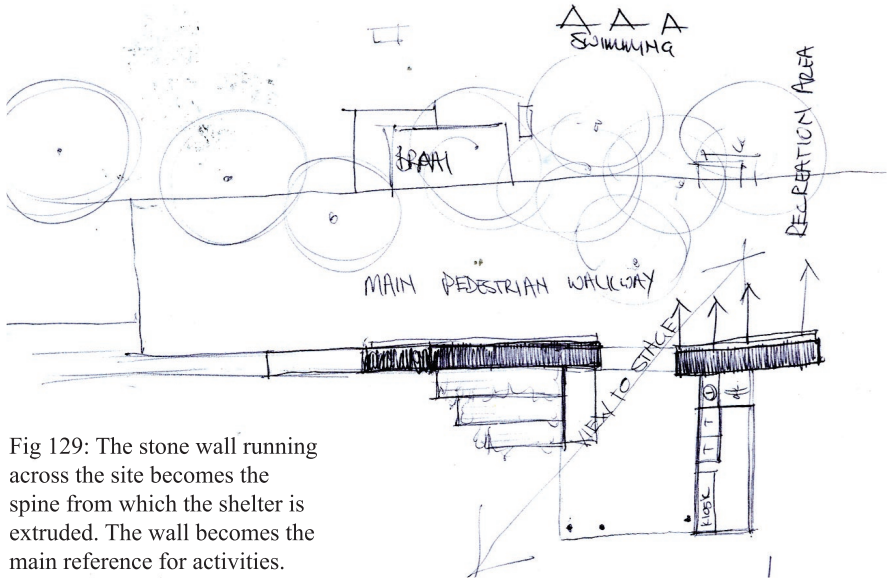


Fig 129: The stone wall running across the site becomes the spine from which the shelter is extruded. The wall becomes the main reference for activities.



Design Process

Fig 130: The wall through the site facilitates a variety of functions, signage, framed views, seating and circulation

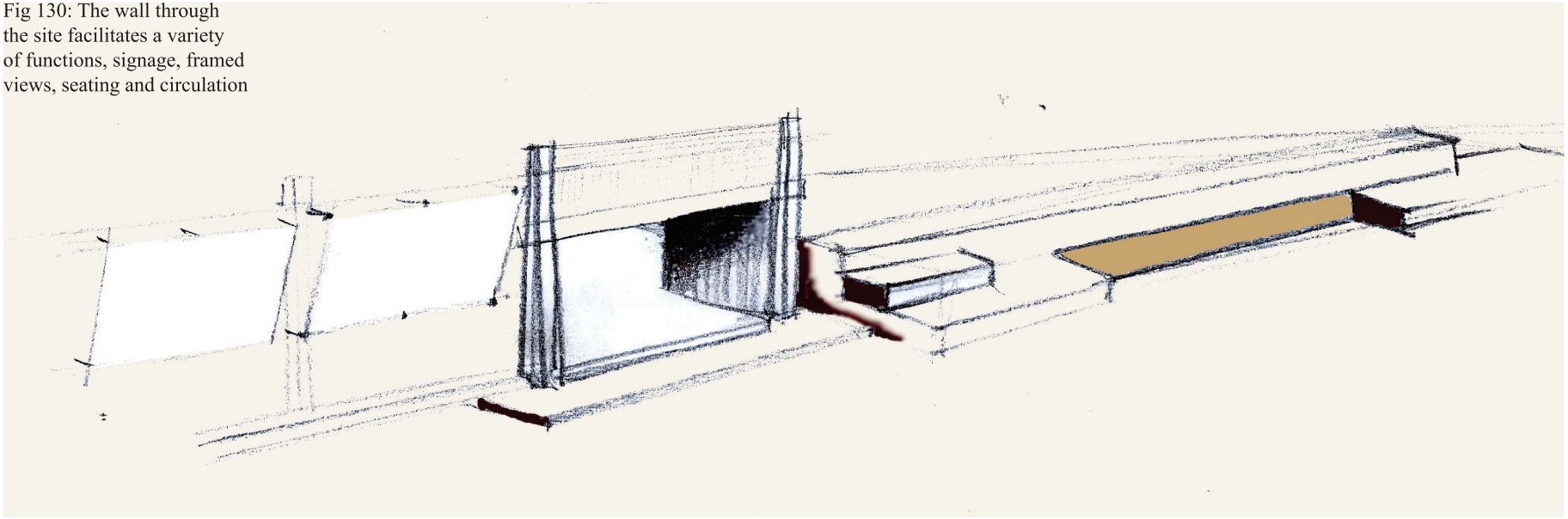
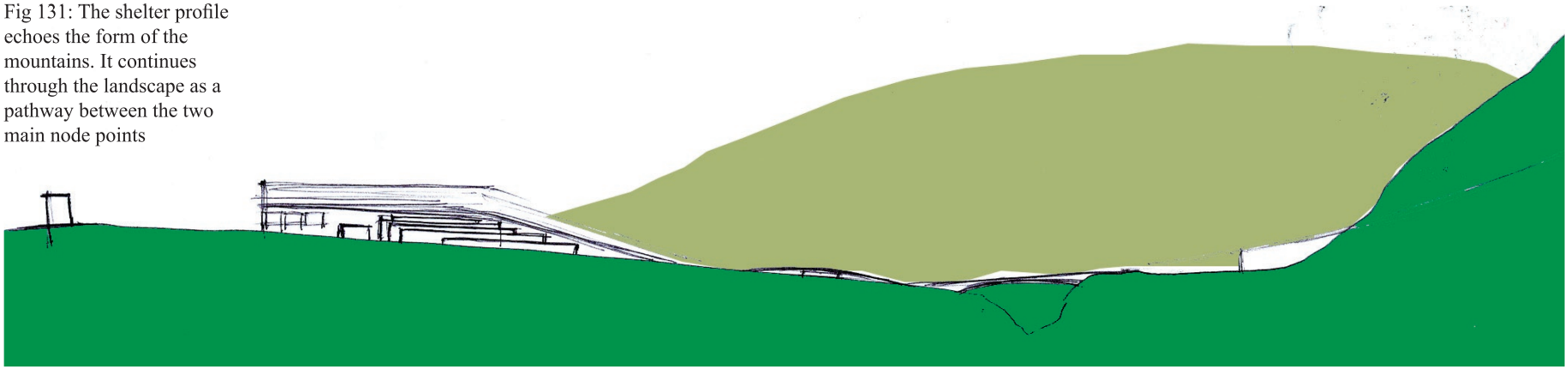


Fig 131: The shelter profile echoes the form of the mountains. It continues through the landscape as a pathway between the two main node points





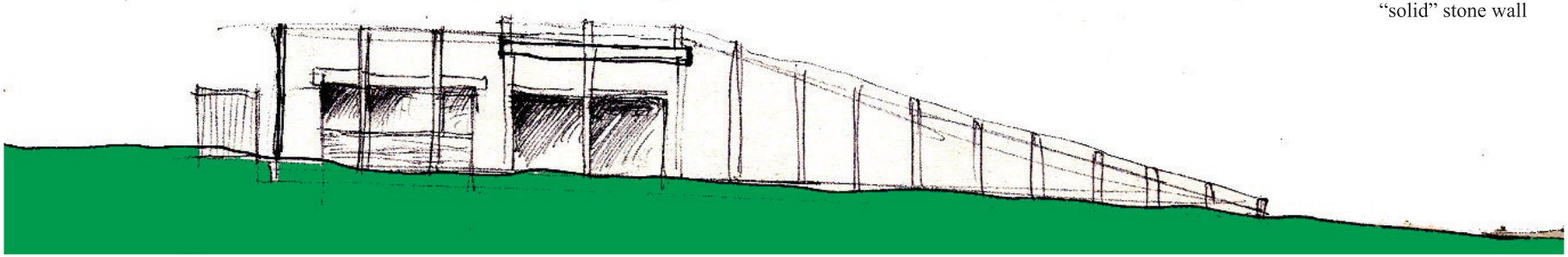


Fig 132: Functions in the shelter are framed as punched holes in "solid" stone wall

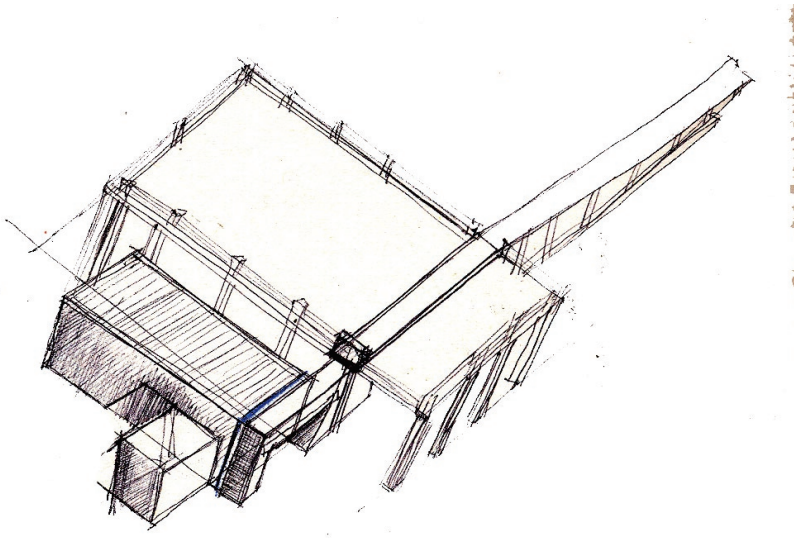


Fig 133: The shelter begins to take form, roofs cantilever into the path-way drawing the users' eye toward the dramatic scenery where the gorge cuts through the mountain

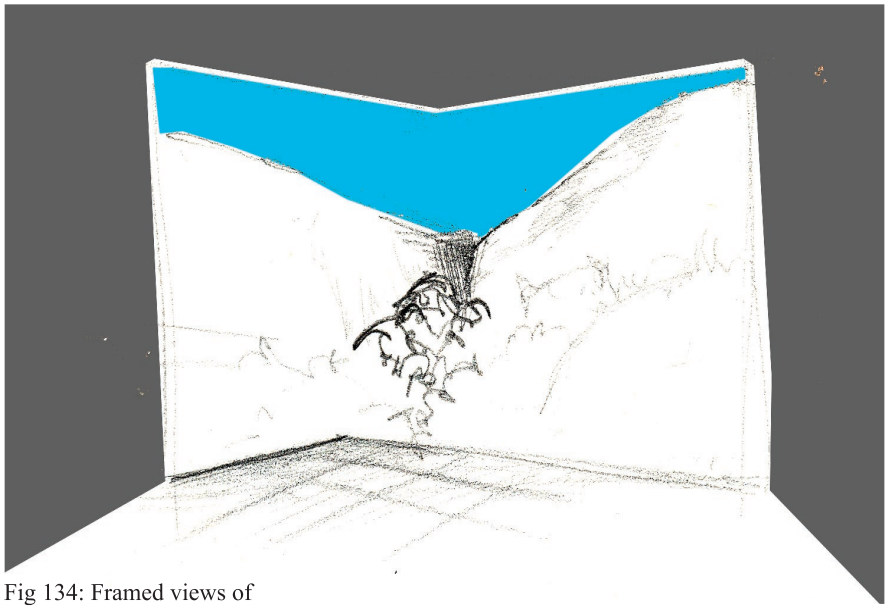


Fig 134: Framed views of the landscape are glimpsed as the user moves along the path



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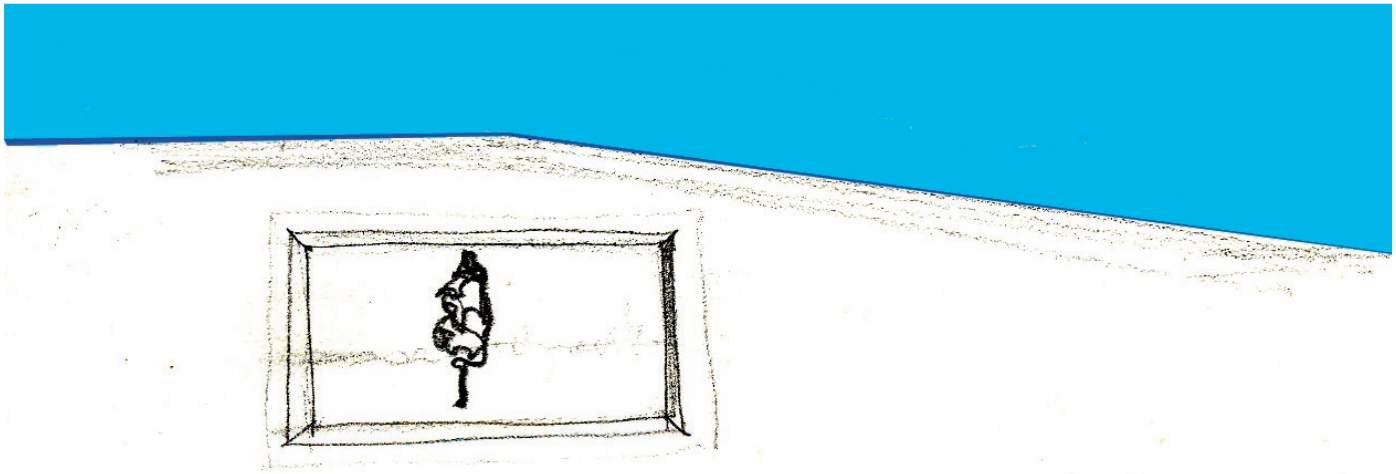

Fig 135: The access ramp to the roof can be moved over or through

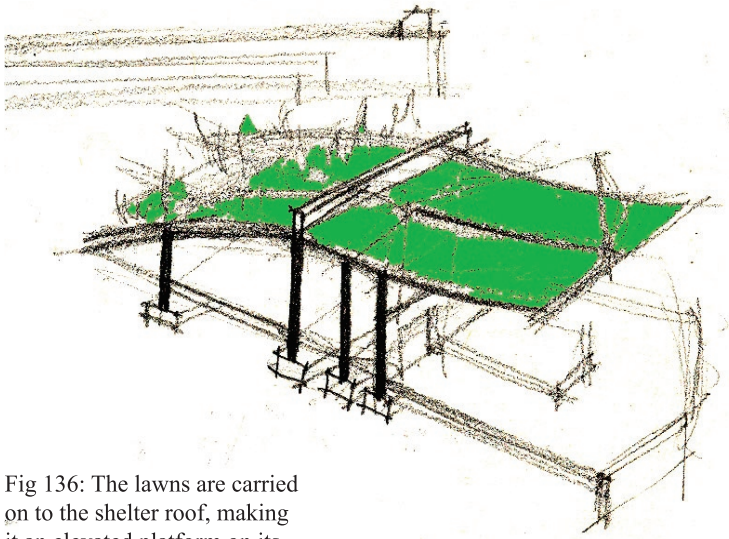

Fig 136: The lawns are carried on to the shelter roof, making it an elevated platform on its own

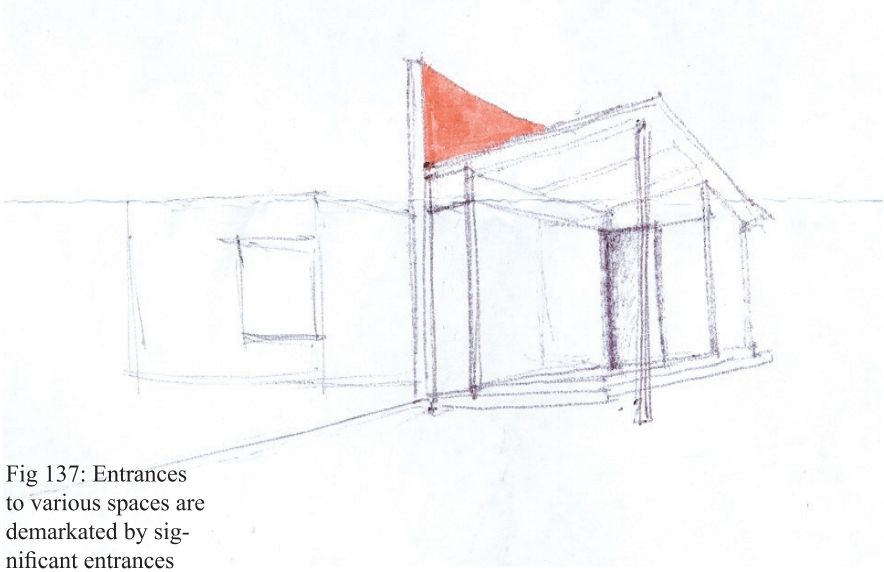

Fig 137: Entrances to various spaces are demarkated by significant entrances



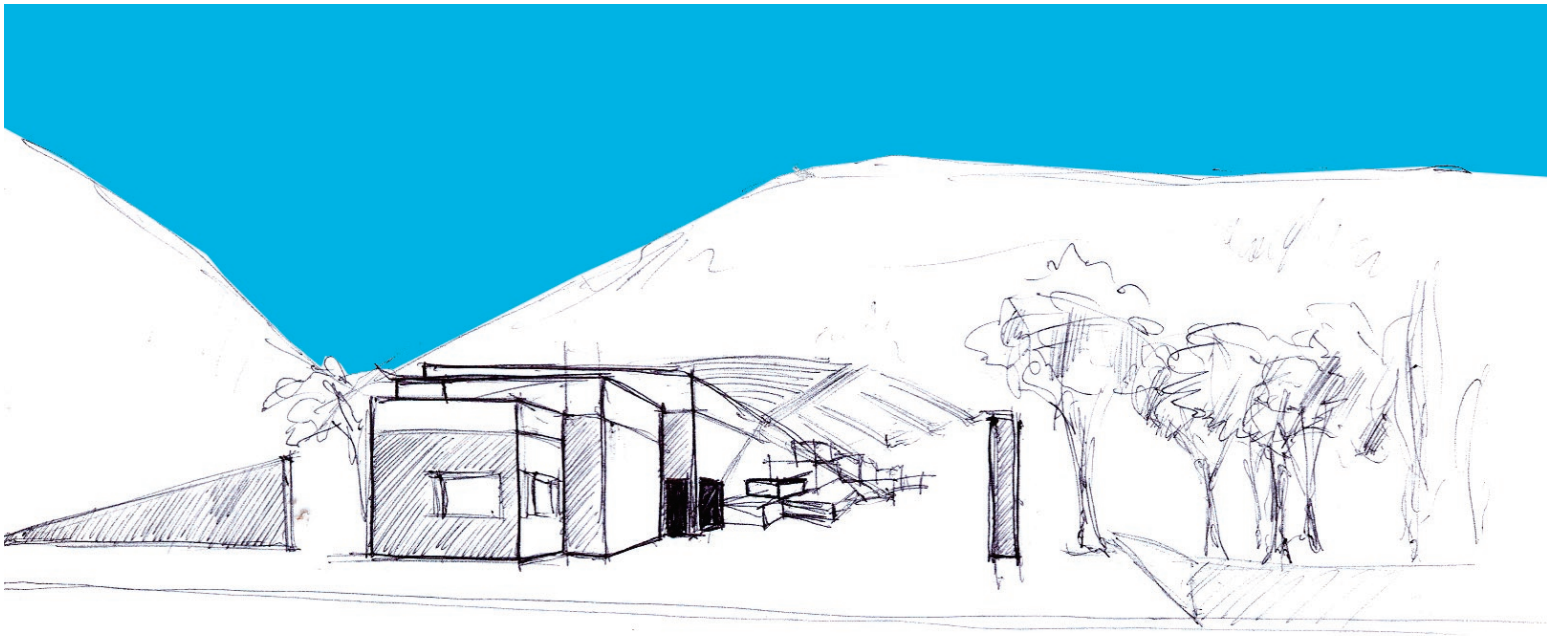

Fig 138: Perspective study of the mass and form of the shelter. A view from the entrance



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Fig 139: Functions to serve the shelter area are all to the south

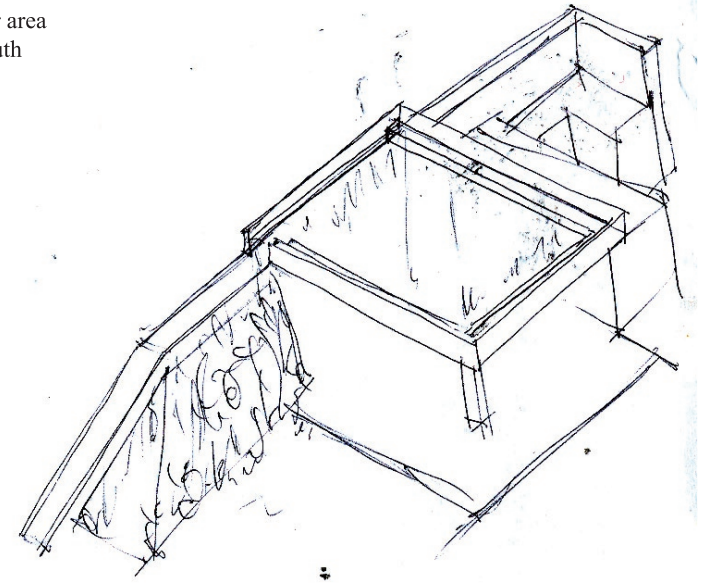
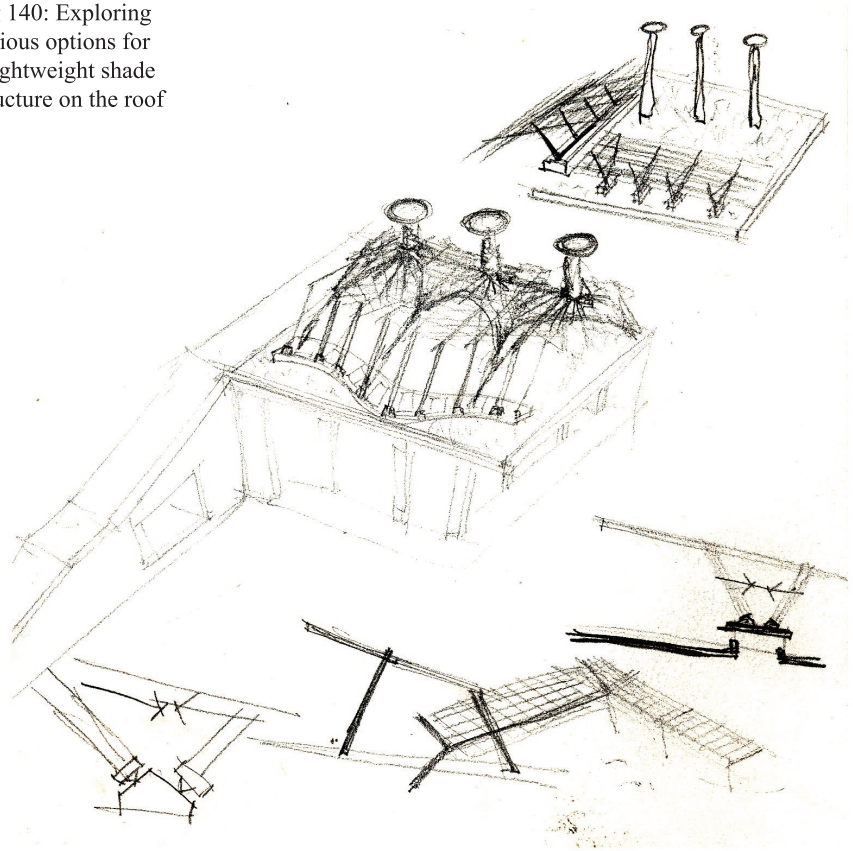


Fig 140: Exploring various options for a lightweight shade structure on the roof



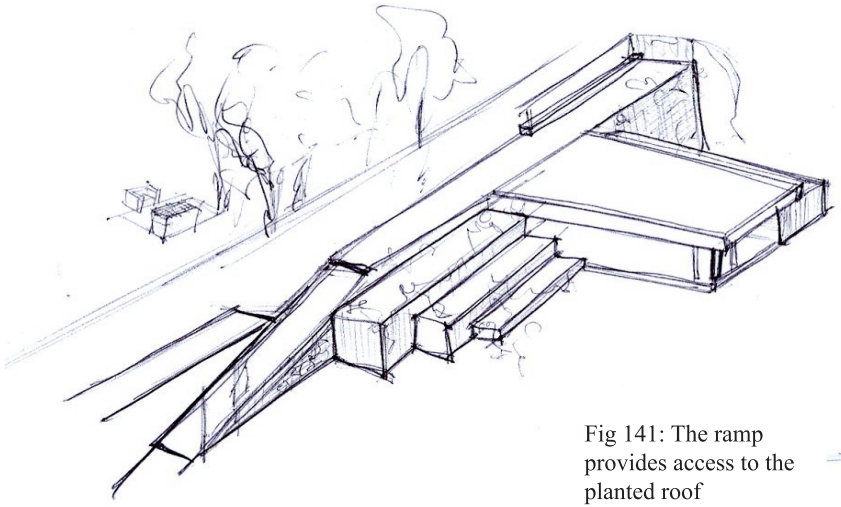


Fig 141: The ramp provides access to the planted roof

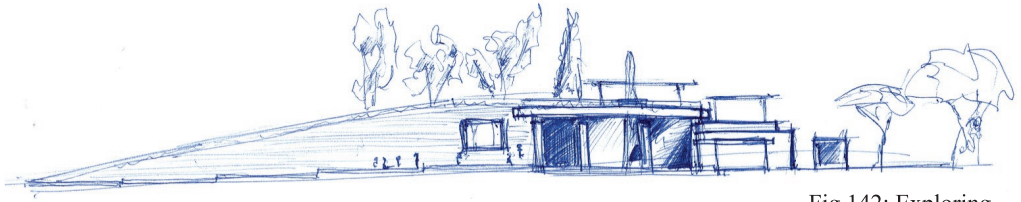


Fig 142: Exploring the western facade



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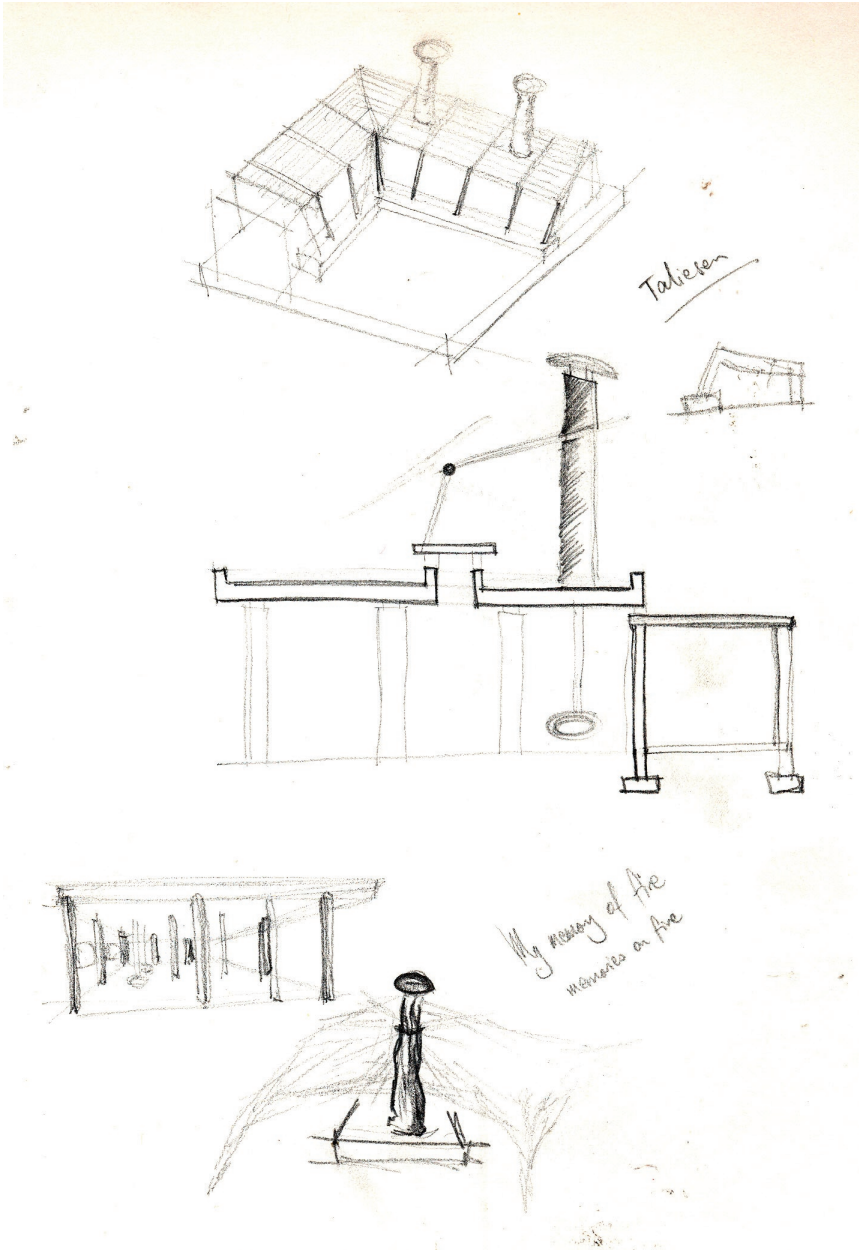
Fig 142: Sketches exploring the shelter structure and various qualities of space



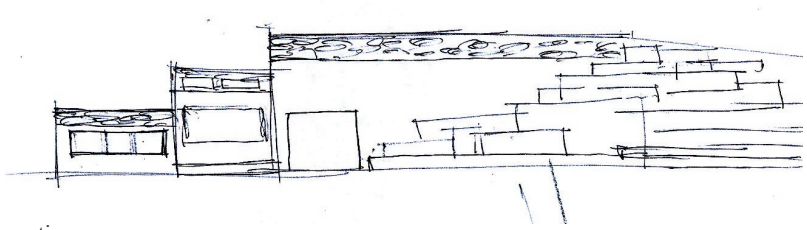


Fig 143: Fragmenting the shelter structure into the surroundings

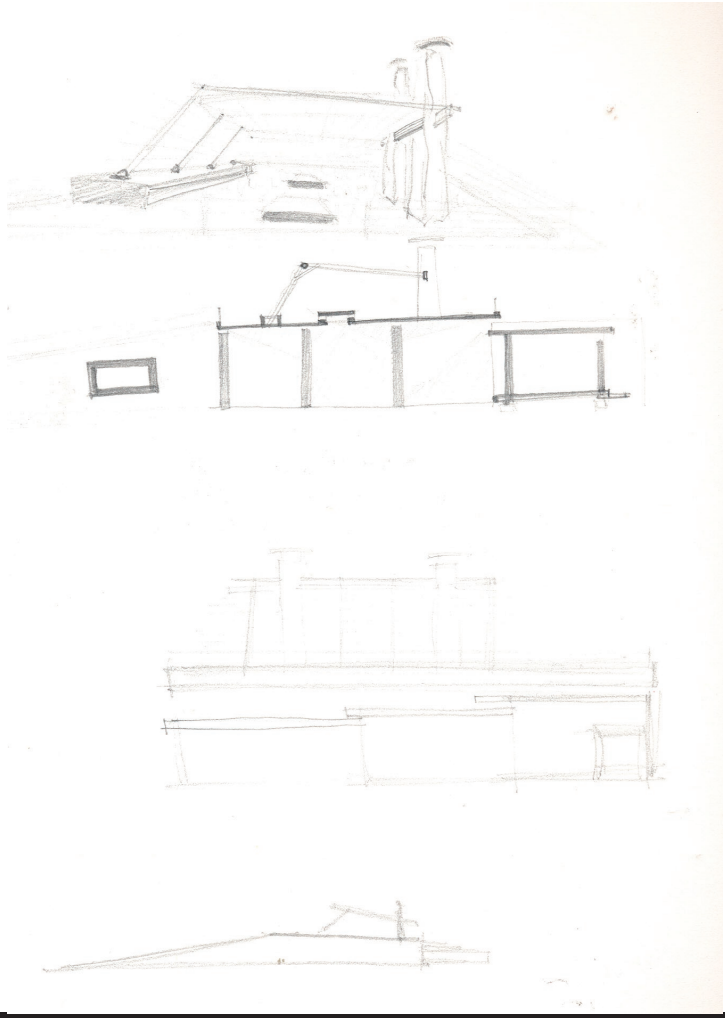


Fig 144: Lightweight shading on the accessible roof



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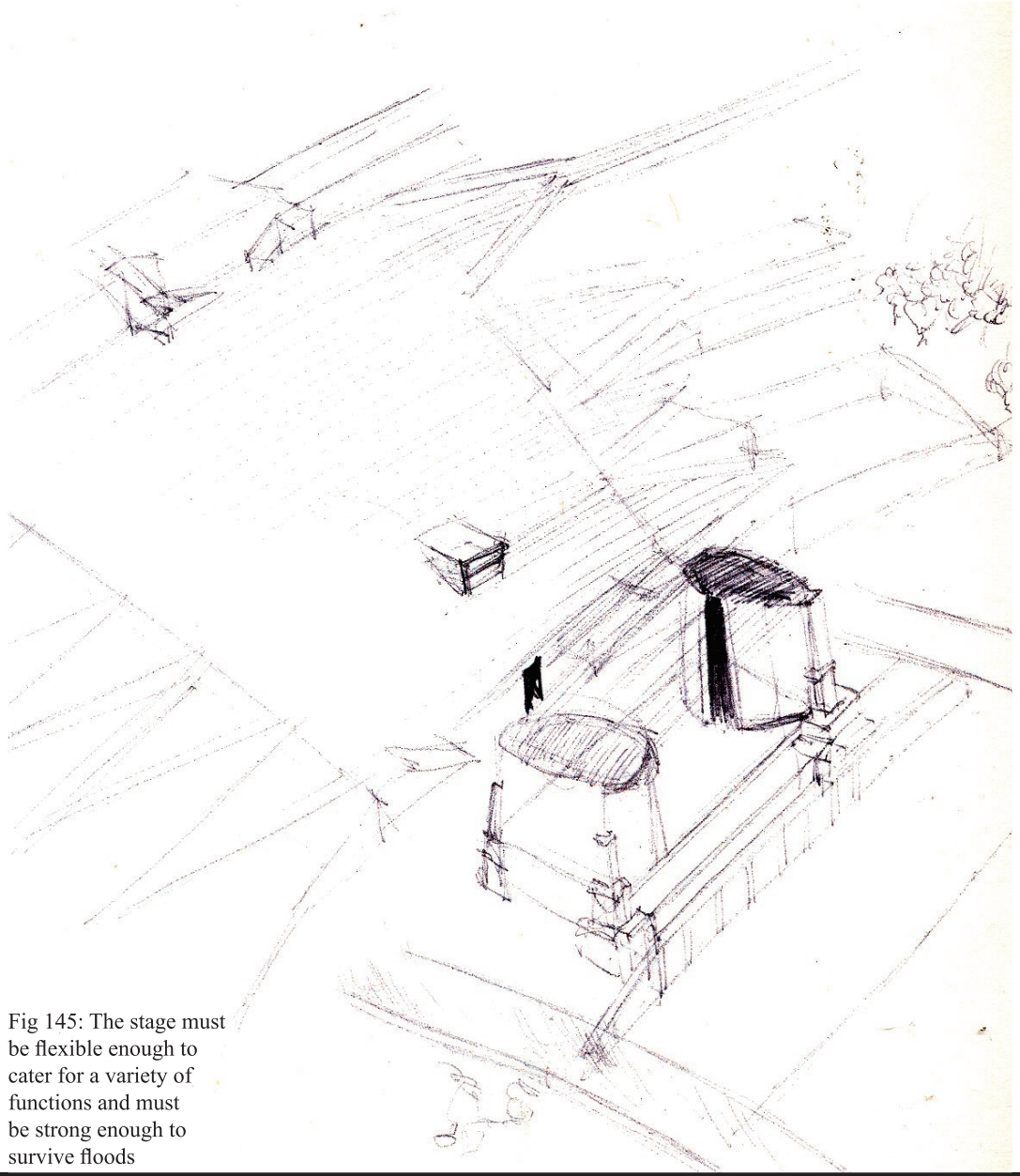


Fig 145: The stage must be flexible enough to cater for a variety of functions and must be strong enough to survive floods

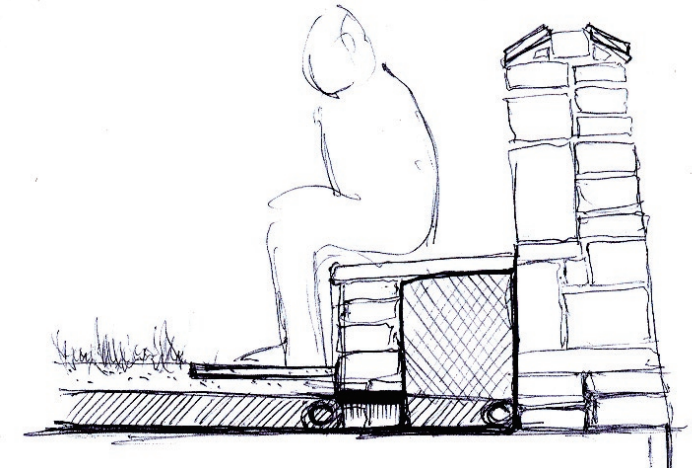


Fig 146: Seating is to be provided along wall edges wherever possible

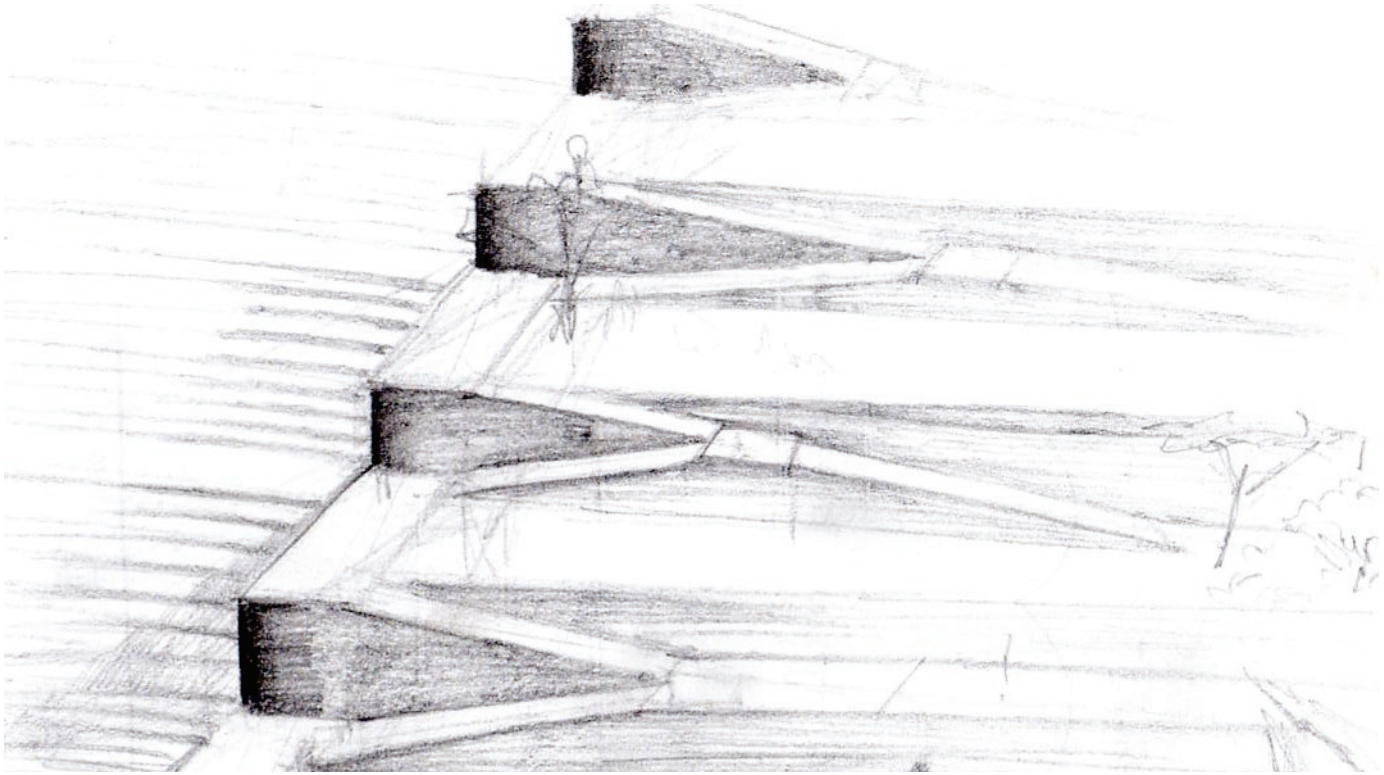


Fig 146: The ramp system up the slope is to double as a shaded terraced area



Design Process

Fig 147: The ramp system provides the edge for the seating bowl and allows a soft transition into the landscape





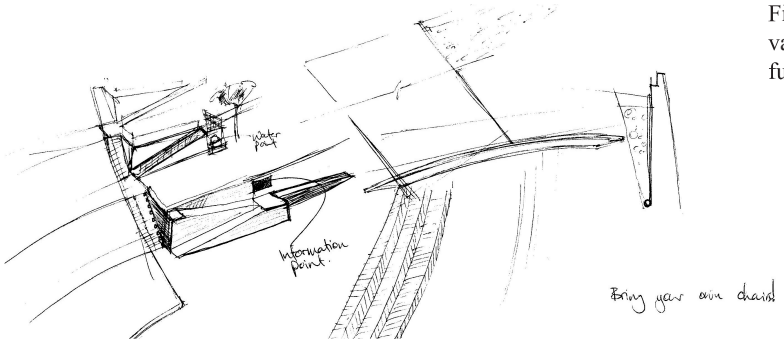
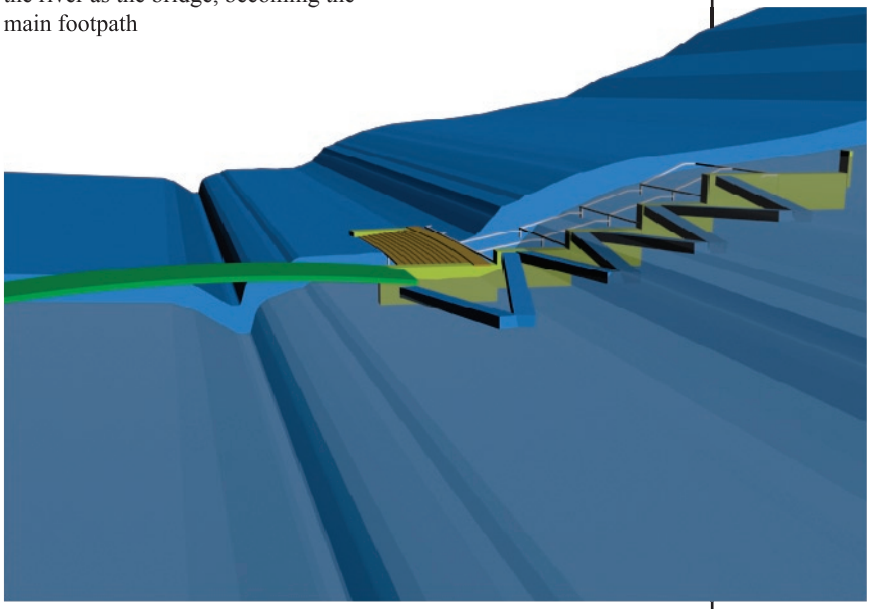


Fig 148: The ramp system must be varied and provided with secondary functions at key points

Fig 149: The seating area lies across the river from the main area of the park, the edge of the seating is extended across the river as the bridge, becoming the main footpath



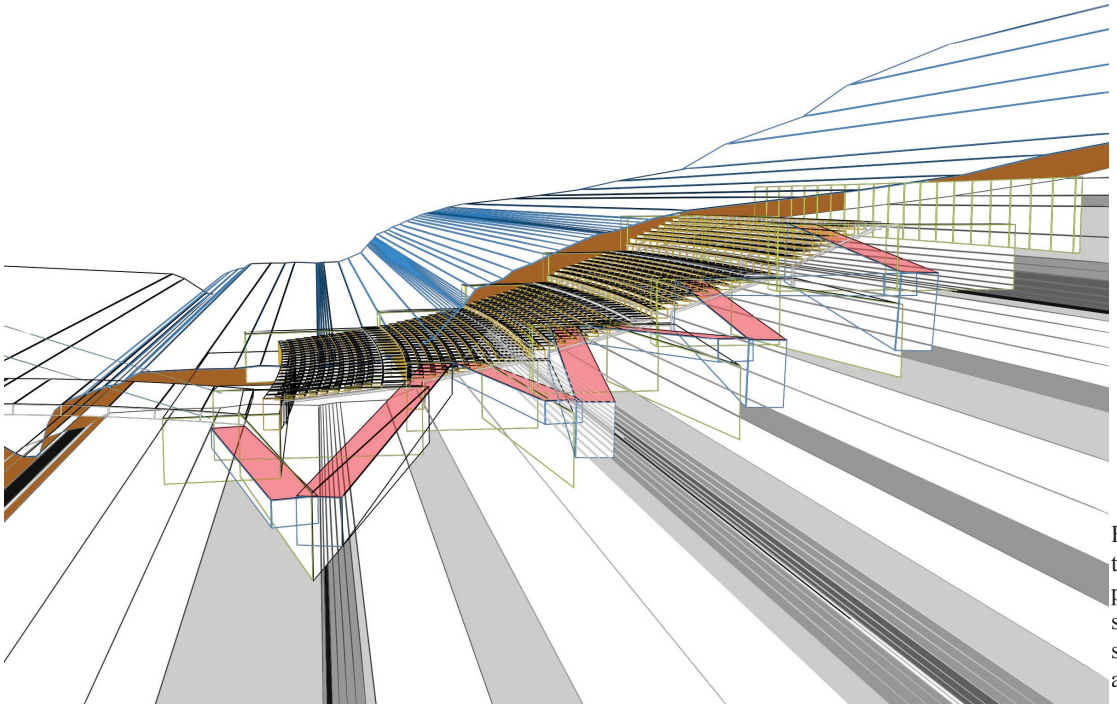


Fig 150: The slope of the mountain provides the perfect shape for the seating with little cut and fill

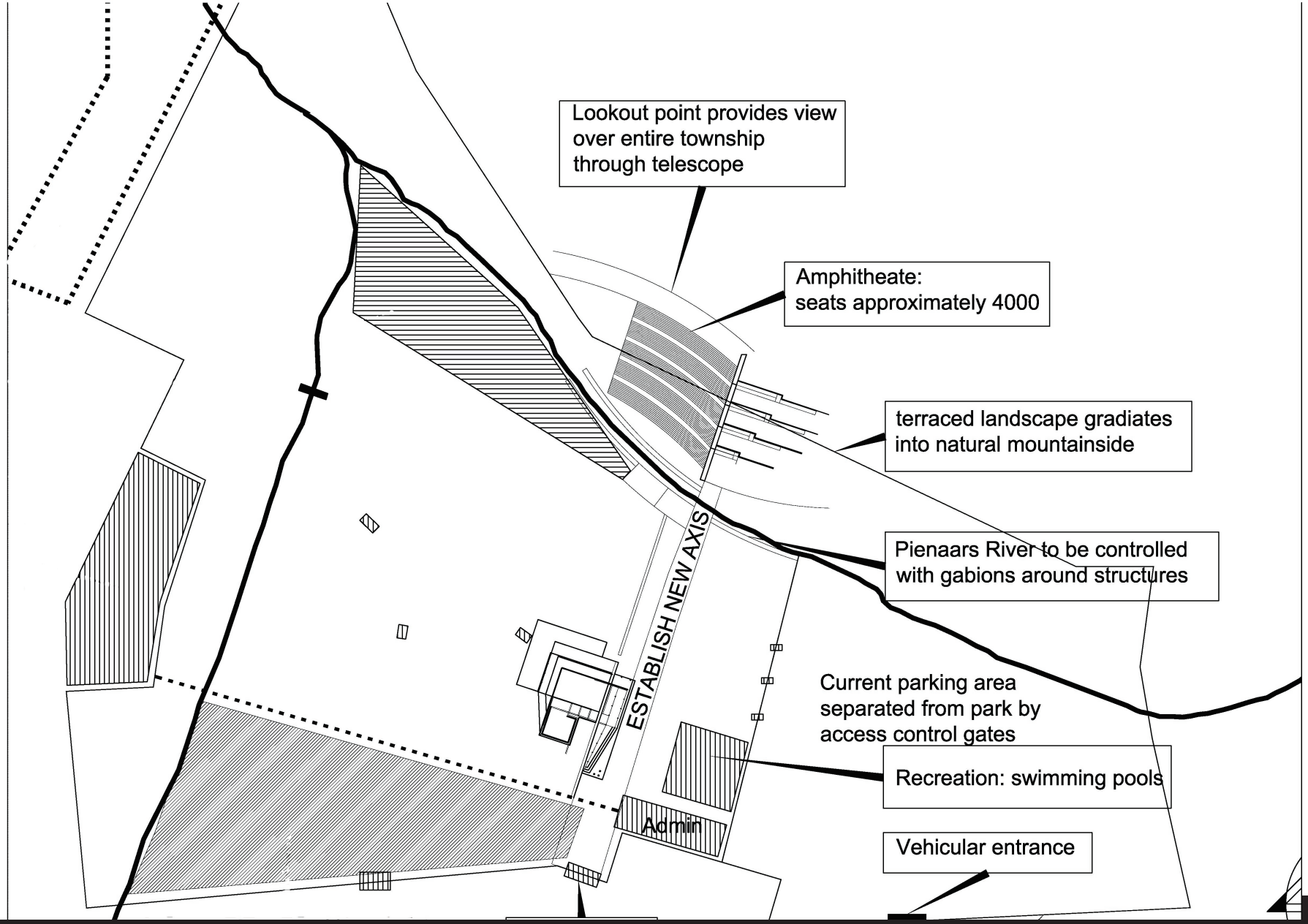


Design Process





Design Process



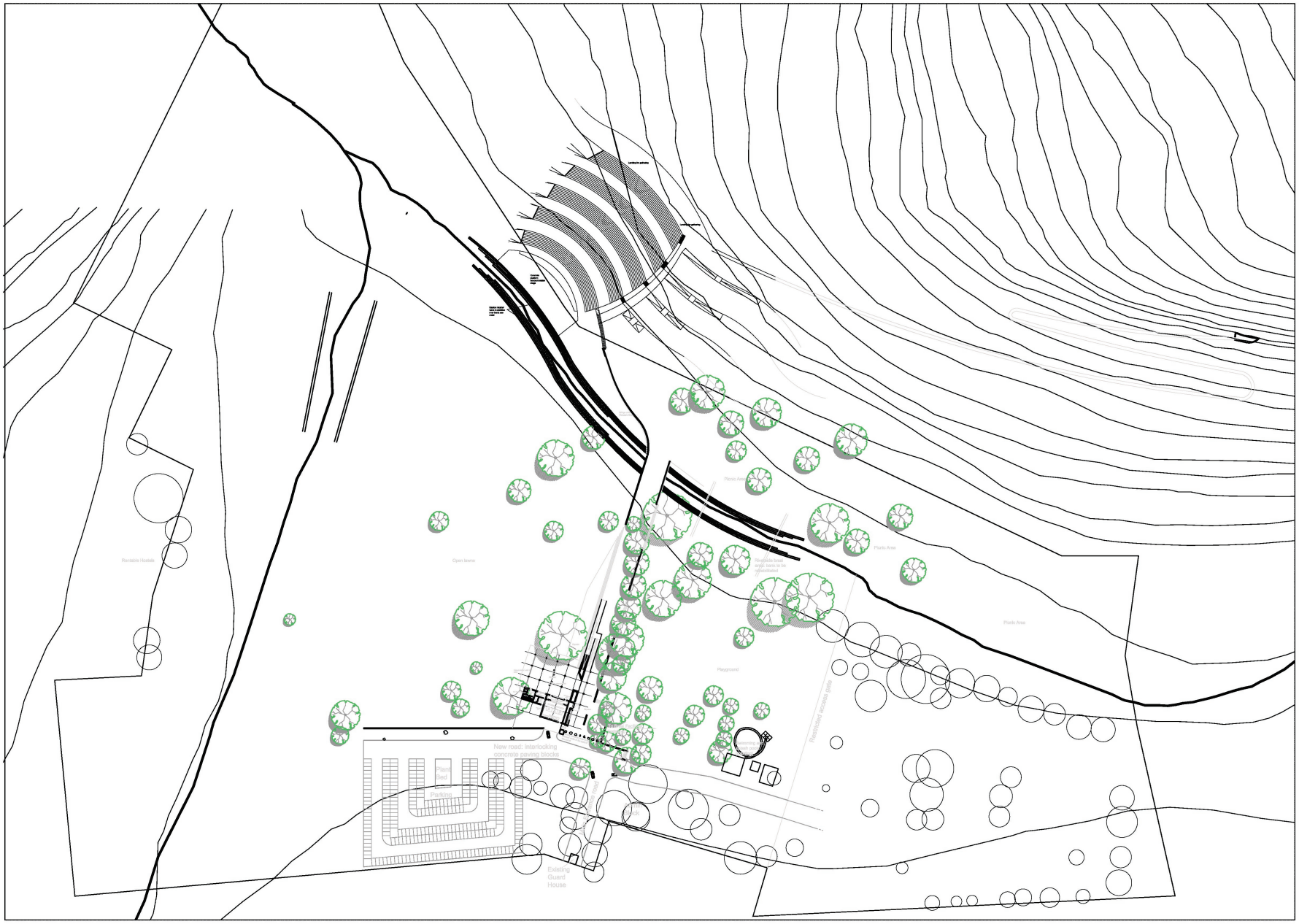
Design Process





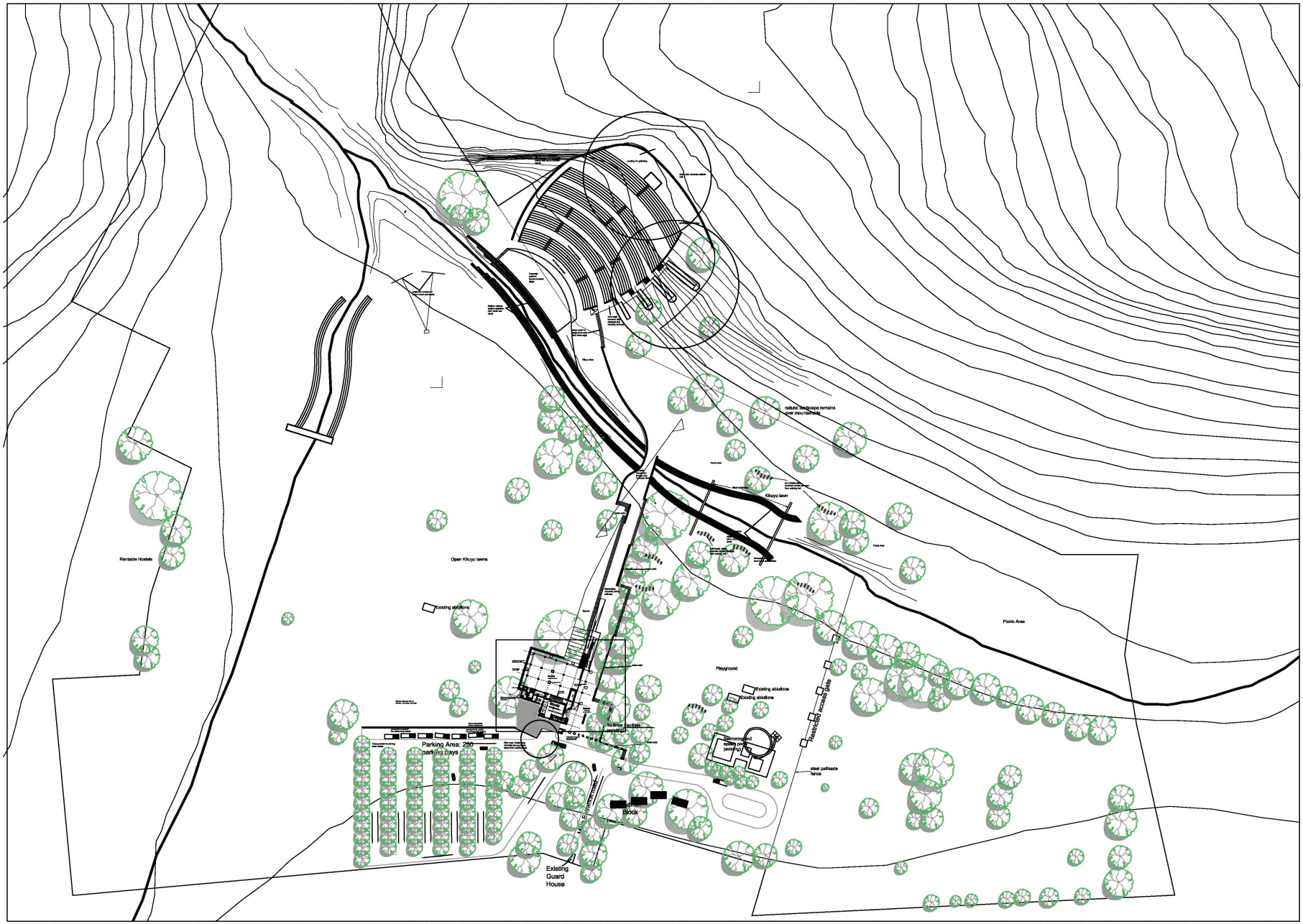


Design Process



Design Process







Design Process

Technical Investigation:

Climatic data and Biophysical Information:

Pretoria 22’44” South; 23’11”East

Pretoria has hot summers and moderately cold winters with moderate humidity levels. (Holm; p36) It is a summer rainfall area. The most suitable structures for such a climate feature high thermal mass, small openings and are often surrounded by a porch or “stoep.” (Konya; p22)

Rainfall charts of the Pretoria area collected over the last 60 years indicate an average annual rainfall of around 600mm with surges of just over 100mm per month in January and December and virtually no rain during winter months. (SAWeather.com) This means that there will be 140mm² of gutter for every 1m² of roof area to cater for the times of largest concentration of rainfall. (Wegelin; p43) Also, if rainwater is to be harvested for use throughout the year, approximately 40% of 600mm per square meter of roof should be catered for: 240mm per square meter of roof.

Pretoria Climatic Data: see adjacent chart

The optimum temperature for a building is around 22ºC. (Konya; p16) This is the outside temperature optimum for the body to regulate its own temperature. The temperatures in Pretoria average between 20º and 30º between winter and summer (SAWeather.com), so it is clear that, in this region, more needs to be done to ensure that

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Temp	High	Ave Max	Ave Min	Low	Ave mm	Days>1m	24h Max
January	36	29	18	8	136	14	160
February	36	28	17	11	75	11	95
March	35	27	16	6	82	10	84
April	33	24	12	3	51	7	72
May	29	22	8	-1	13	3	40
June	25	19	5	-6	7	1	32
July	26	20	5	-4	3	1	18
Auguat	31	22	8	-1	6	2	15
September	34	26	12	2	22	3	43
October	36	27	14	4	71	9	108
November	36	27	16	7	98	12	67
December	35	28	17	7	110	15	50

Fig151: Climatic data of Tshwane



Fig152: Composite view standing at base of mountain across the river



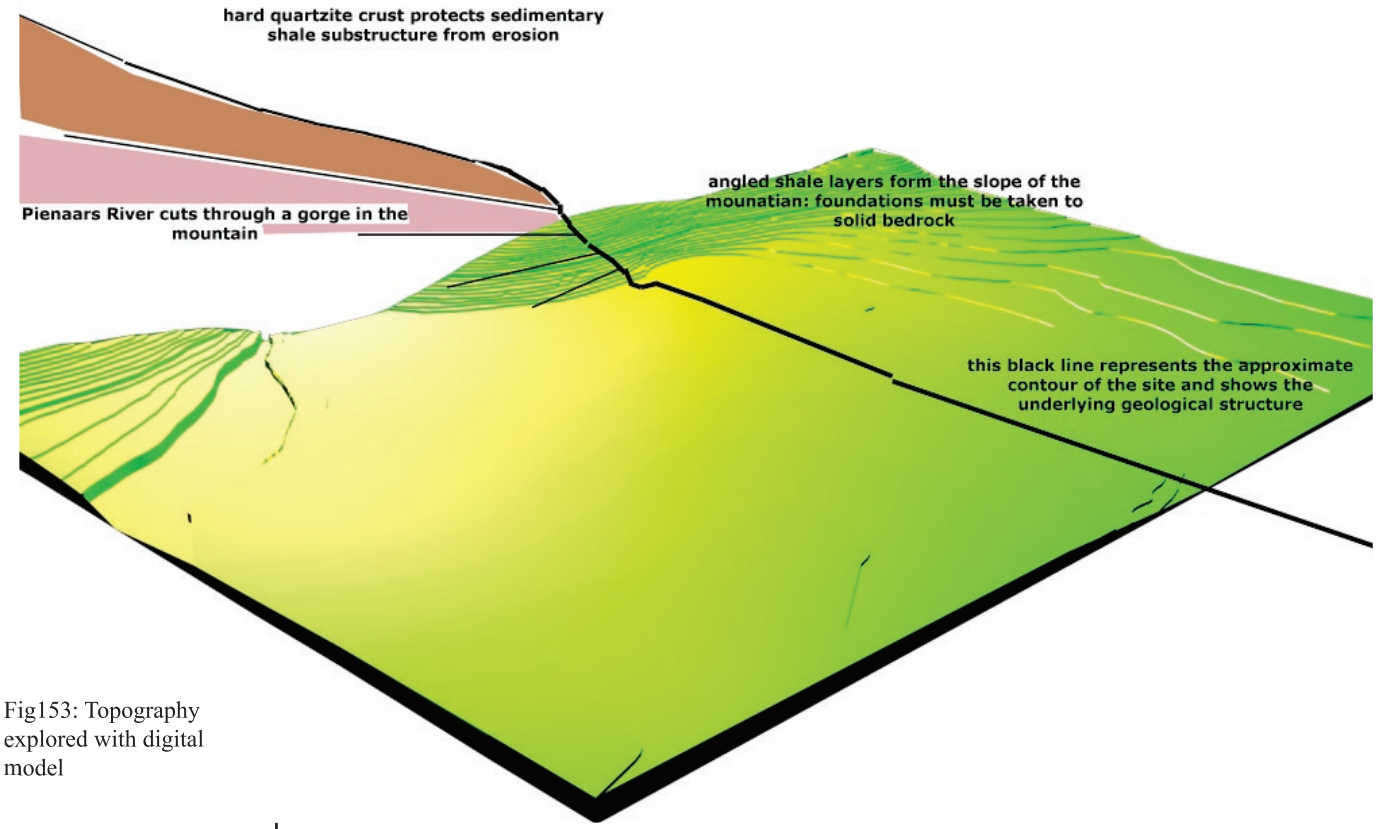

Fig153: Topography explored with digital model

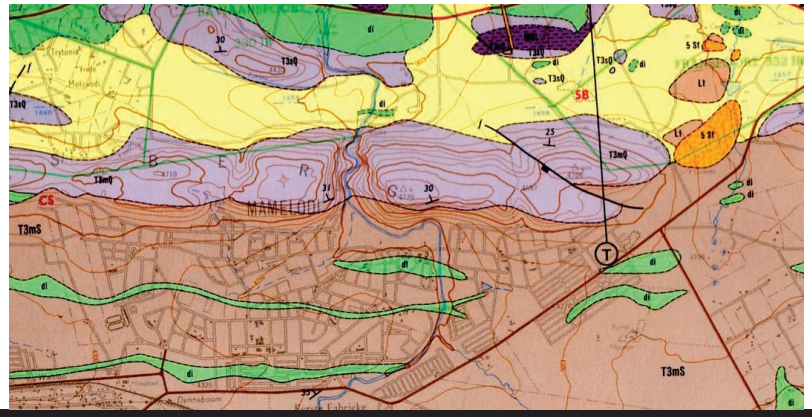

Fig154: Geological map of the region courtest of the Council for Geoscience



buildings stay cool during summer months. Roofs or ceilings must be insulated properly against direct solar gain and proper ventilation through structure is essential. Materials with high thermal mass draw heat out of the air through convection. Sun movement patterns show that the maximum solar altitude varies between 88º in mid-summer and 46º in mid-winter. A design angle of 64º is usually used, where the shadow line from the roof falls at the lowest point of openings from this projected angle. Since this building's North façade has no glazed openings, this design principle has merely been referred to since it must be clear that the desired effect is deep solar penetration into the shelter in winter but deep summer shadow. Shade is ensured through the use of 700mm roof overhang and the height of the roof permits sun just under 6m into the building at midday in winter. Deciduous trees which surround the reception building and are common throughout the park, also contribute to a seasonal temperature control inside the building between summer and winter, providing summer shade and allowing winter sun.

Predominant wind direction:

Summer: east-north-east to east-south-east with 41% days breezy

Winter: south-west with occasional north-east with 60% days breezy

From personal experience over 25 years in Pretoria it is clear that lush and deep summer shade is desirable. Winter can be dealt with by allowing direct sun and providing fire.

Amphitheatre

Amphitheatre:

Geology and topography of the area:

The Magaliesberg Mountain Range consists of a pediment, a layer of quartzite which effectively acts as a cover over layers of alternating shale and quartzitic sandstone. (Council for Geoscience (CFG); 1990) There may be hard igneous intrusions of diabase (hardened magma from deep in the earth) found throughout the range and a bed of loose angular rocks suspended in a soil matrix is present at lower parts of the slope, the tallus.

"The most common methodology for investigating slope stability is a combination of aerial photographic analysis backed up by field checks." (Hechner. S.R. p149) Although this technique does not guarantee reliable results or comprehensive data, it has had to be used in this case as a full geotechnical report simply is not feasible for this project. Shale, the main geological feature of the slope where the amphitheatre is proposed, is a stable sedimentary rock which can be used as a construction material and can easily and support concrete foundations. The physical characteristics of shale can be defined as having "close parallel discontinuities formed in mudstones during diagenesis and resulting in fissility". (Hechner. S.R. p148) Footings and structure on the slope will thus have to respond according to exact conditions at the position of construction as proper grounding can only happen properly directly on the bedrock. Herbert Baker insisted that all the foundations for the Union Buildings be taken all the way down to

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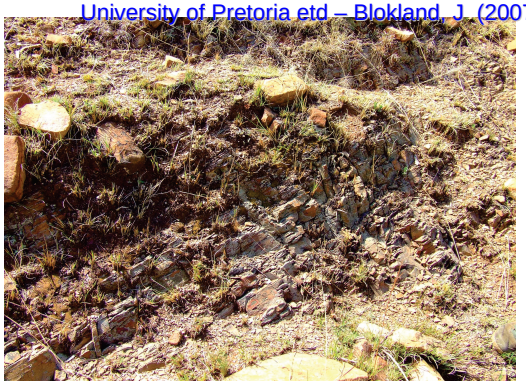

Fig155: Exposed shale substrata against the slope



Fig156: Angular quartze rocks in a loose soil matrix provides an abundance of building material where excavation must take place

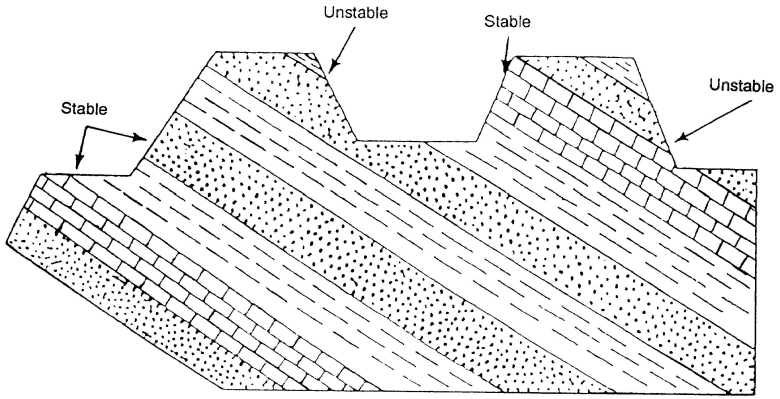

Figure 10-1. Slope of bedding planes.

Fig157: Slope stability as it related to sedimenary geological structure





Fig158: Very steep slopes are often stabilised with a combination of textiles and planting

Fig159: Naturally occurring plants are most suitable for this purpose



Amphitheatre

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Fig160: Great Zimbabwe is a great example of the tradition of stone construction in Africa

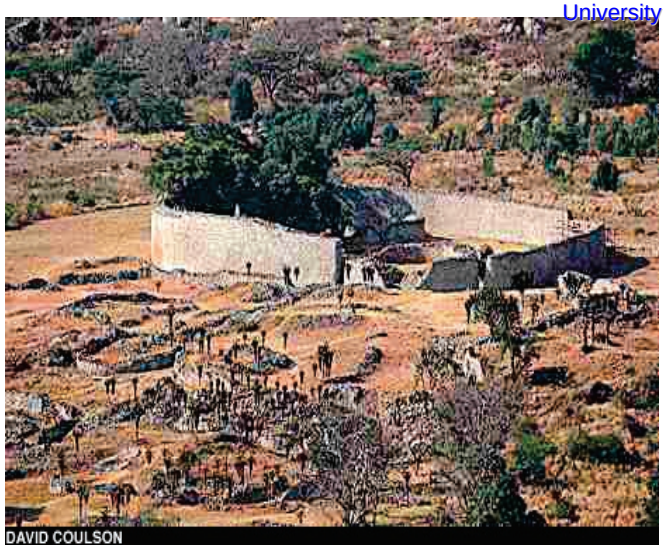

Fig161: The southern slopes Meintjieskop where the Union Buildings are sited are stabilised with local shale

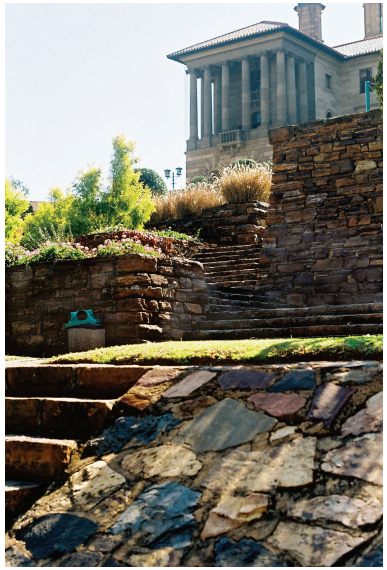

Fig162: Gabion walls are used to prevent erosion in rivers





the bedrock. (The Union Buildings; 2006) This also the recommendation for the amphitheatre and all stabilising retainer walls on the mountain slope. Foundations will mostly be piles, but some key walls will be continuous as illustrated in the final drawings.

Slope stability is critical for a safe and durable structure. For the sake of ease of construction and the fact that suitable material is abundant on site, retainer walls not taller than 2.5m will be built of locally sourced quartzite. Reinforced concrete with gravel drains and weep holes which are then clad in stone will be used for any walls taller than 2.5m.

The angle that the underlying geological formations follow is conducive to a naturally stable slope as illustrated in figure 157. In harsh conditions, various options are available for slope stabilization including geotextile reinforcing, rock reinforcement and steel mesh (as is the case along Chapman's Peak Road in Cape Town). The two decisive factors in slope stability are slope gradient and ground water. The main objective in slope stabilization in to ensure that failure of land mass does not occur which could threaten the safety of people. A terrace system will be employed for the access ramp area. In the seating area, a concrete surface will ensure minimal hydraulic permeation into the soil. Water will be carried away over the surface.

The horizontal finished surface of the amphitheatre will be concrete cast in situ with surface drainage

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to the two outer edges of the seating bowl. Vertical surfaces can be left bare or built up as exposed shale.

The angle of the slope and the required position for the stage will play a large role in determining the shape and position of the amphitheatre seating. See figures 176 and 177.

Stone wall construction:

A slenderness ratio of 1:12 is generally used for stone construction if the rock type is stable enough. (Smit; 3-5) The rock naturally found in Moretele Park is quartzitic sandstone or metamorphic quartz. The highest height for a wall in the project is around 6m. Walls less than 2.5m tall will be built of stone. Taller walls will be built of concrete left with an off-shutter finish.

Gabions are free draining walls composed of loosely packed aggregate caged in steel “baskets” which can be used for anything from structural walls to retainer walls and embankment reinforcement. Gabions also allow plant growth. In landscape application, gabion construction will be employed, in some scenarios, for its low visual impact, ease of construction and its ability to support plants. Welded galvanised steel mesh gabion baskets are recommended with indigenous fill.





Fig163 - Fig 169: The process of building dry packed stone retainer walls requires specialised skills








Fig170: Freedom Park features stone cladding which appears dry packed, but is fixed with steel ties to masonary structures



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Fig171: At Red Rock Ridge, natural topography has been used to house an amphi-theatre

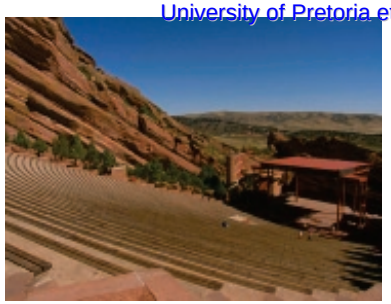

Fig172: The finished seating area has little impact on the natural surroundings



Fig173: Ancient ruins on the English west coast demonstrate a variety of possible spaces on a slope





Fig174; 175: Advances in digital sound technology make it possible to simulate the effect of theatre sound almost anywhere



Acoustics:

Since this is an open-air theatre, acoustics can only be regulated up to a point. Invasive noise from traffic or machinery being operated in the township can not be avoided, but noise sources are all situated far from the seating area. Large performances will rely on the use of sound equipment brought along when stages are erected as is currently the case. The simplicity of the amphitheatre ensures that many usually detrimental factors such as creaky seats or noisy doors are eliminated. Audience approach is limited to the sides of the seating bowl and separated from seated patrons by the stairs. Sound level requirements are usually around 40dB (average: various genres of performance each consider different levels to be optimum), marginally less than the average conversation level voice from a few meters. (Burris-Meyer and Cole; p42)

Vertical surfaces on seating should be left exposed to encourage some reverberation within the seating bowl, but this will be largely negated by people when seated who will themselves absorb a large portion of the sound. Since the theatre space is open air, there is very little that can be done structurally to enhance the acoustic properties of the space. Reverberation and sound control will have to be done electronically. A sound control platform will be provided at the top of the seating bowl from which the technical aspects of performance can be controlled.

Amphitheatre

Line of sight:

View of the stage is fundamental to a staging any variety of performance. Elevation of the seating is determined by the potential lines of vision as. “Occupants of all seats are visually related to the performance when their seats are oriented toward the stage.” (Burris-Meyer and Cole; p33) This necessitates the curving of the arrangement of the seating on plan. Were seating to be individually furnished, their distribution horizontally would be staggered, since “no patron should sit directly in front of another one unless more than one row distant.” (Burris-Meyer and Cole; p33) In this amphitheatre, seating organisation will be left up to the patron. Vertical elevation of seating is determined by “providing every second row full sight elevation (12cm)”, a mathematical projection of which, combined with the distance between rows, provides the parabolic shape that informs the placement of seating. (Neufert; p479) The front row is positioned 10m from the front of the stage and from here, the seating arrangement is projected up the slope.

Horizontal seating position is determined by the projection of an arc from the centre stage outward, maximising the required view. This is done to visually connect the audience to the stage, and also to create a sense of “better mutual perception.” (Neufert; p479)

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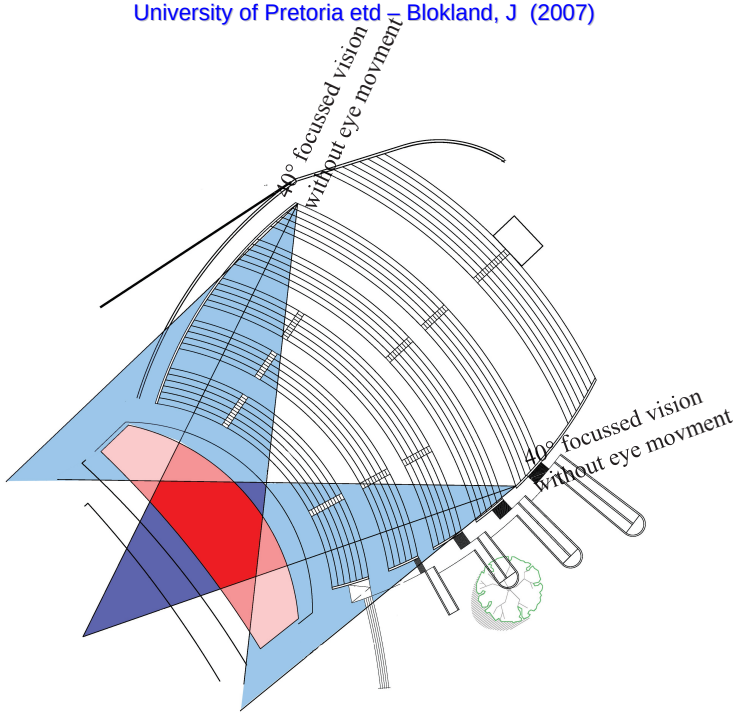

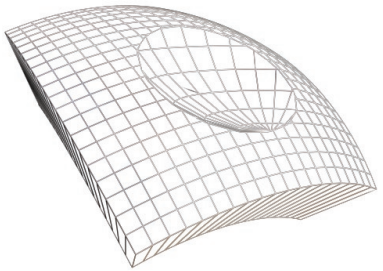

Fig176: The shape of the amphitheatre is concetually an indentation in the earth, a scoop out of the mountainside

Fig177: Plan view of seating arrangement; curve of seating projected from focal point

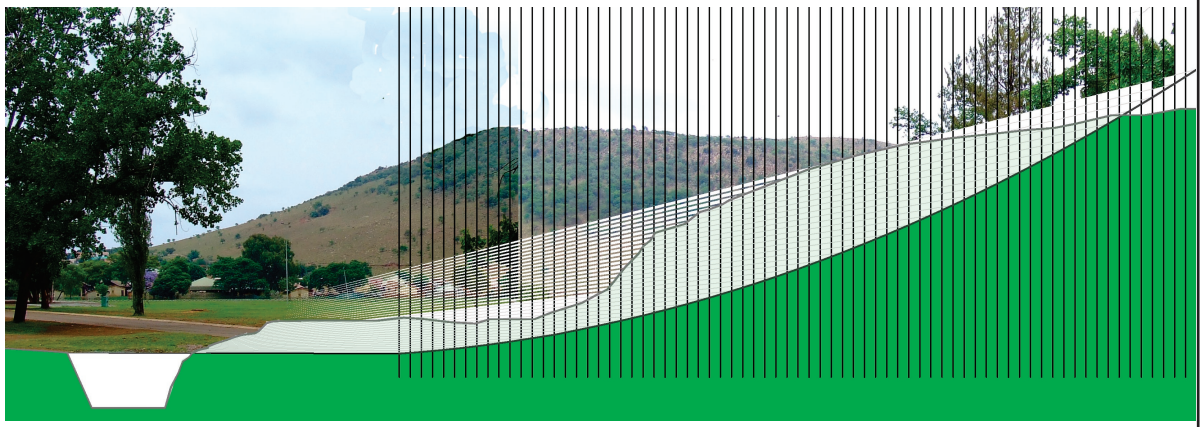

Fig178: The parabolic line that is used to organise the seating area is calculated by projecting full sight elevation (12cm) to every second row to ensure that all spectators have an unobstructed view of the stage.



Amphitheatre

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Fig179: Matte House in Zapallar, Chile, built of locally sourced stone, blends into its surroundings

Fig180: Elisa House in Chile shows a smooth transition into a sloping landscape

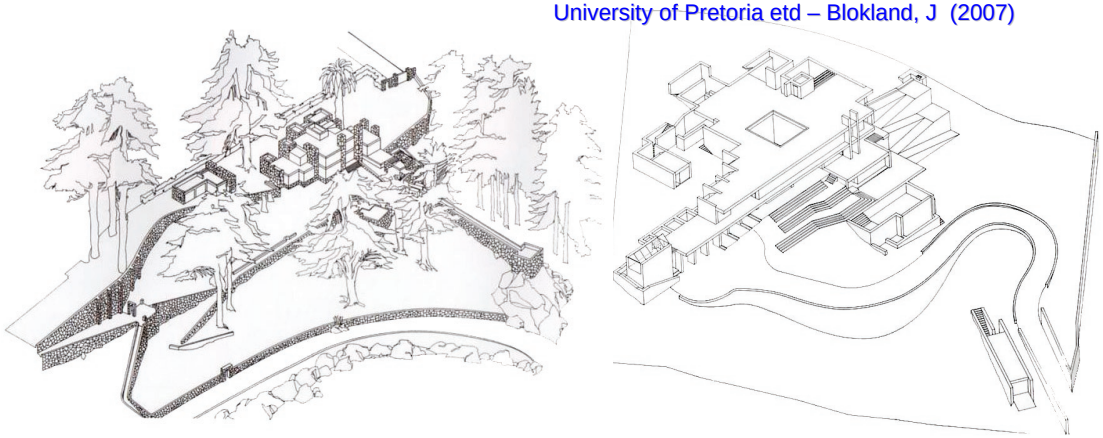

Fig181: 50 year floodline



Fig182: Access is imperative for an inclusive public space





Other commonly considered factors such as ceiling shape, side wall design and proportions of the theatre are obviously not applicable in this instance.

Access:

All areas of the park are to be accessible by all. The provision of ramps allows for this. Stairs furthermore permit movement around some landscaped areas and provide alternative options for easy movement. Legs are the ultimate all terrain vehicle.

Footbridges allow movement across the Pienaars River, but must be designed by an engineer and must take the 50 year flood line of the river into account (as shown in the adjacent diagram). The conceptual design of the main bridge, in this case, forms a continuation of the main footpath and spans flat across the river. It spans between 7 and 8 meters and is proposed as a concrete structure.

Ramps can have a maximum inclination of 1: 12 or 5 degrees to the horizontal (**as per SABS and NBR requirements**) and decrease in width the further up the slope they are found, so as to accommodate reducing numbers of users.

Drainage:

Although there is a natural system of surface drainage already existing, the built structure of the

amphitheatre requires special consideration for its own drainage especially where retainer walls are needed as part of the landscaping. All retainer walls are to be provided with gravel drains and water outlets to the outside. Surface flow will be directed to channels which drain into the Pienaars River at designated points. The amphitheatre related functions are to be drained as shown in the final drawings.

Reception Building:

Rammed Earth:

Africa, particularly the north, has a rich rammed earth tradition and many local peoples such as the SeSotho tribe and the Ndebeles from the northern parts of South Africa employed this technique for wall construction centuries before the arrival of any colonists. Rammed earth is renowned for its properties of thermal inertia, its resilience to weathering and its aesthetic qualities which vary depending on the technique used in construction. “Nearly every industrialised country has tried to update this building method” (Doat et al; p41) The aesthetic finish in this project will be similar to a section through sedimentary geology.

A soil with 15 - 18% clay content is the most suitable material for use in rammed earth structures. This soil is mixed to a content of approximately 6% cement which stabilises the mixture (McHenry; p98). Soil tests are performed to determine whether the mix is consistent and suitably moist.

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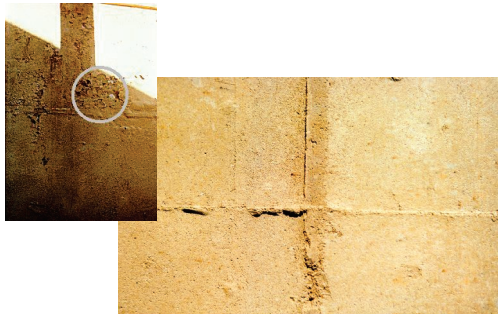



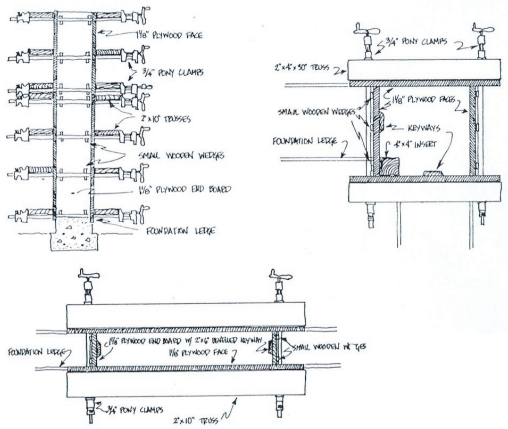

FIGURE 6.20. Typical wall section.

Fig183: Adobe construction has been used in Central and South America for hundreds of years. iIt remains popular

Fig184: Rammed earth is at risk of erosion if not treated where exposed.

Fig185: Rammed earth wall joint

Fig186: Modern rammed earth structures are elegant and durable

Fig187: A typical shuttering system used for rammed earth construction

Fig188: Wall ties used to attach frames are built into the wall during construction

Fig189: All openings are supported with a lintol, generally of wood or precast concrete

Fig190: A typical section through a rammed earth wall



Fig191a: Earthworks

Fig191b: Foundations

Fig191c: Formwork

Fig191d: Compaction

Fig191e: Wall going up

Fig191f: Bond beam

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Ideal soil composition is:

0 - 15% gravel
40 – 50% sand
20 – 35% silt
15 – 25% clay

All organic matter should be removed from the soil as well as any stones “larger than a walnut.” Rammed earth walls are generally built with a slenderness ration of around 1:10 implying that a wall 500mm thick can be built up to about 7m. No walls should ever be less than 400mm wide, for practical purposes during compaction.

Walls are built in place inside form work. Compaction of the soil mix is done by hand. Foundations are of cast concrete, wall footings are to be built from local rock to a level of at least 300mm above the natural ground line, providing a weather proof base for the rammed earth walls to stand on.

All wall openings must be supported by a pre-stressed concrete lintol and built into the wall to a depth of at least 300mm.

Details of a typical wall section, basic formwork, lintols, bond beams and openings are illustrated in figures 186 - 189.

Because of the stresses placed on formwork during compaction, formwork should be of 4-5cm thick planks or reinforced if no suck planks are available.

Kitchen:

Kitchen function diagrams have been used to determine the functional arrangement of this kitchen based on the various requirements in a typical commercial kitchen. These have been adapted to the needs of a kitchen which will function primarily as a cafeteria, but have the capacity to adapt efficiently when catering for formal functions. The size of the whole kitchen is sized so as to cater for a multiple course meal for an average of 200 people at events in the “shelter”. However, school outings see the park hosting around 500 children at a time and the festivals larger numbers still, when the kitchen will operate as a cafeteria. The kitchen must therefore be able to produce meals of a ranging type and variety.

The electrical requirements of a kitchen of this size necessitate the installation of 3-phase power for some industrial equipment like stove plates, ovens, power hose cleaners, dish washers and plate warming ovens (salamanders).

The area designated as the waiter station on the final plans is to have a dual function: it will be used as a condimant and cutlery shelf for the cafeteria and also as the servery for waiters at catered functions. Waiter stations will be provided at either end of the passage and the passage is designed around a one way movement system for waiters, where clientelle will more through a controlled queing aisle when using the cafeteria.

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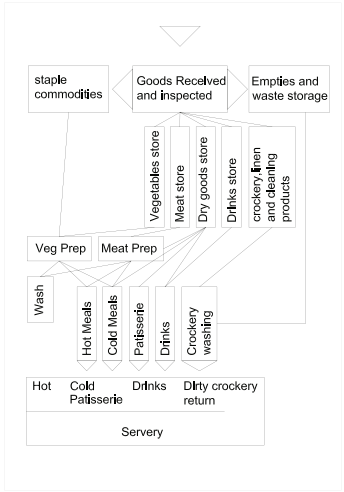

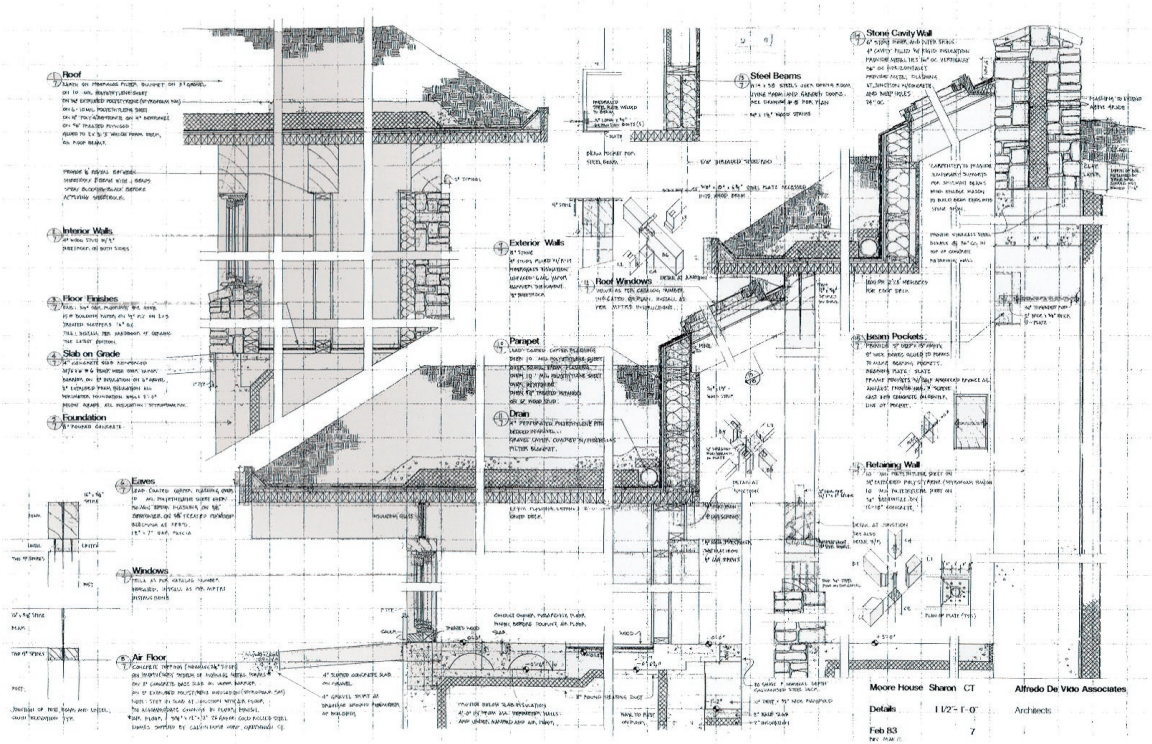

Fig191: Kitchen function diagramme after Neufert

Fig192: Kitchen organisation diagramme after Neufert

Fig193: Details of a planted roof at Moore House in Sharon, Connecticut



Fig194: Roof edge detail showing outlet spout and planting layers

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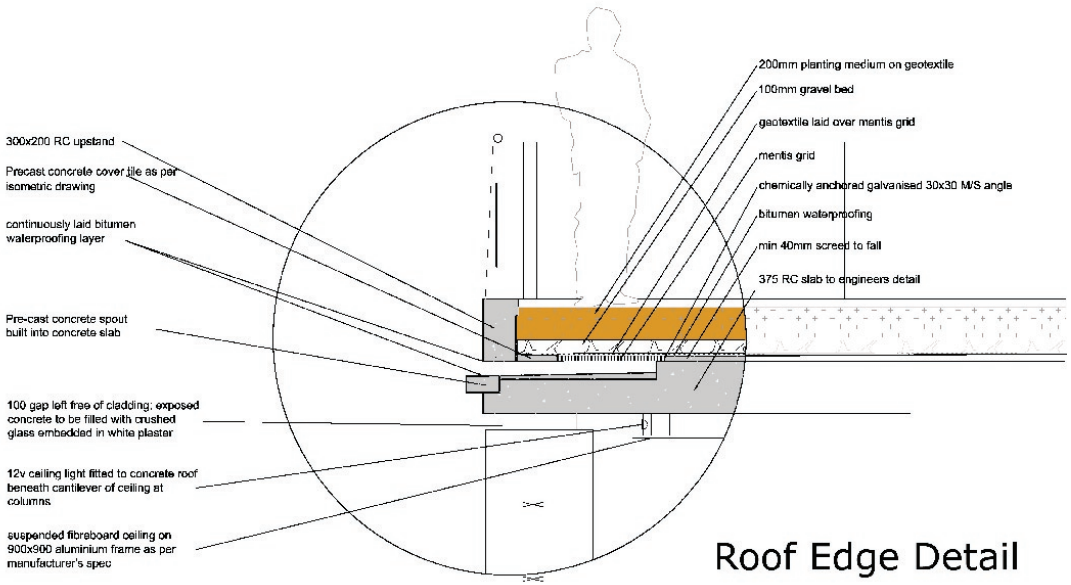
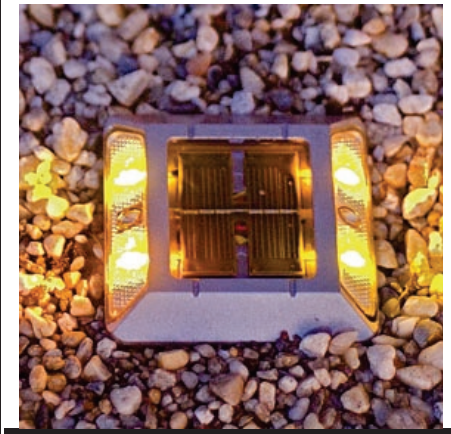


Fig195 and Figure 196: Examples of solar lighting paving blocks







Planted roof:

Planted roofs have long been used in flat roof buildings. They provide an aesthetic quality not possible with steel sheeting or tiles and also serve to insulate roofs against excessive gain from solar radiation. Planted roofs can also be made accessible to building users.

Waterproofing is essential. A gravel bed below the soil layer facilitates drainage and must be separated from the soil by a geotextile. The proposed planting, kikuyu lawn grass, has water needs similar to the lawns found in the park and as such can be maintained by processes already in place. This composite structure is detailed in the final drawings and a precedent of application can be seen in figure 192, House Moore.

Calculations for drainage are based on the area of the roof. A minimum of 140mm² per m² of roof area is required for gutters which in turn are to be laid at a minimum pitch of 1:200 to the outlets. (Wegelin; p10.28) Outlets will have no downpipes, but spouts (large weep holes) will direct water into sunken collection basins lined with river stones in the concrete skirt surrounding the building.

Details of the drainage and water outlets are shown adjacent.

Lookout platform:

Lighting:

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Solar powered lights set inside paving blocks permit lighting along pathways without the installation of cables or a power supply. This makes lighting pathways in remote or conserved areas feasible and simple. Examples are shows in Figures 195 and 196 Maintenance will simply mean replacement.

The mountain is notorious for being a haven for criminals and vagrants and ever encroaching informal settlers are beginning to threaten the future of the mountain as a nature reserve. Lighting against the slope will eliminate some potential danger by illuminating the area after dark. Furthermore, lights will be visible throughout the year from within Mamelodi and thus serve as a constant reminder of the heritage that its occupants share.

Lookout Points:

There is currently a project underway to establish hiking trails on the mountain. The lookout platform, the “Eye of Mogale” has been proposed at the base of the cliff high up the mountain, but this facility will only be accessible by foot. it is to be no more than a small (2m by 3m) platform where a robust naval-type telescope will be mounted to look over the township. The primary platform will be positioned at the top of the seating area of the amphitheatre.



Fig 201: Example of a public use telescope

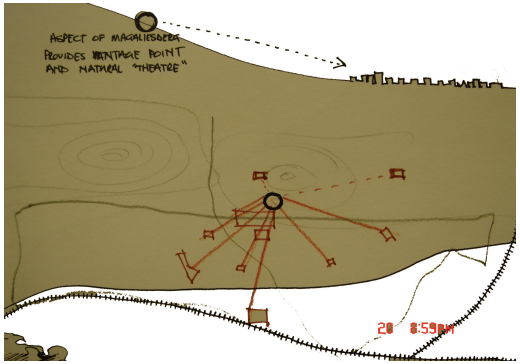

Fig197:

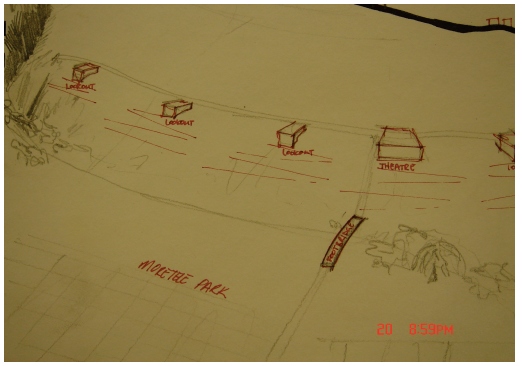

Fig198:



Fig 202: Example of a public use telescope

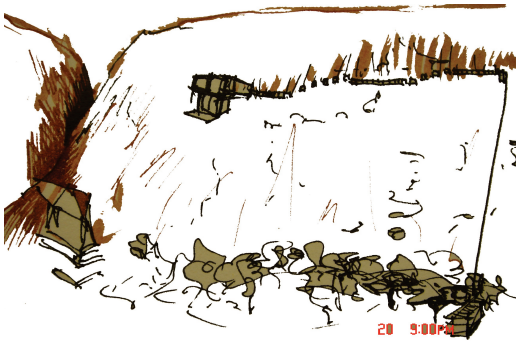

Fig199:



Lookout

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