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RE/CLAIMING THE RIVER'S EDGE

W.O. Mothowamodimo

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Full dissertation title: **RE/CLAIMING THE RIVER'S EDGE:** *The role of landscape architecture in creating meaningful places for a shared sense of community in Mamelodi*

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Degree: Master of Landscape Architecture (Professional)

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University: University of Pretoria

Project summary

Programme: Community Park
Site description: Pienaar's River – Mthunzini Park -Mamelodi Technical High and Vlakfontein Secondary School
Client: Open Space Planning Section, City of Tshwane
Users: Members of the community

Site Location: Erf 329 JR
Address: Mthunzini Park, Mamelodi, South Africa
GPS Coordinates: 25°42'22.10"S, 28°22'02.68"E

Architectural Theoretical Premise: Community Design
Architectural Approach: Creating a new community linking and connecting space between Mamelodi West and East
Research filed: Urbanism and human settlements

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

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

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

Willie Ofentse Mothowamodimo

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dedicated to the memory of my sister Evelyn Abueng Mothowamodimo who passed away in my 1st year, 2006.

Abstract

Rivers once had meaning to societies. This meaning was associated with agricultural practices, spiritual connection with nature, social interaction and the combination of all these different activities and functions which were enjoyed by the whole community. Today these rivers have little (if any) meaning to society. Meaning has been lost due to neglect, pollution and crime. The spirit of community once associated with these rivers is now under threat.

The purpose of this study was to explore the potential of a river system in creating meaningful places for a shared sense of community. It therefore presents an attempt at re/claiming this meaning, through the application of community design theory, with a river's edge intervention that connects people with others, and communities with the river.

The design process started with a site analysis to highlight the challenges and opportunities of the study area, local framework area, masterplan area and focus site. Existing frameworks and precedent studies assisted in compiling guidelines and design principles for the project. The study found that by dealing away with the current negative image of the river and re-introducing activities that the community values, these spaces can be re/claimed as meaningful people spaces. Community design, informed by the concept of place-making, is an appropriate theory for revitalising the river systems which cut through urban landscapes and disconnect communities.

This study suggest that a landscape design based on community ethics, aspirations and cultural values i.e. social aspects of landscape architecture, is most likely to succeed in the long run as it creates a sense of belonging and ownership.

KEYWORDS

Agriculture, community design, Mamelodi, meaningful, Pienaar's river, sense of community, value

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CHAPTER

1

INTRODUCTION

1.1. SIGNIFICANCE OR RIVERS IN AFRICAN COMMUNITIES

Some African communities believe in the concept of botho or humanity of which the essence is well developed by Denbow and Phenyo (2006: 38) who argue that, "the well-being of an individual is not a personal affair but is a function of his or her relationship with other people, ancestral spirits, and even nature. In addition, the health and survival of the community can also, in consequence, be affected by the social behaviour of a single individual." This relationship between people as well as between people and their environment forms a strong sense of place associated with natural features like rivers and hills. The sense of place can be defined as the feeling that people have for a special place (Farina, 2010: 150). This feeling in turn gives the landscape meaning and purpose in peoples' lives.

In traditional rural settlements, rivers were (in some cases, still are) meaningful places connecting and inspiring communities. Rivers not only formed boundaries but were also the social veins activating life in the form of farming opportunities and a healthy environment for social interaction. These linear environments were important public spaces for expression of a shared common culture and socialisation between community members. The river was also considered to be a spiritual place where one can come closer to and communicate with the spiritual world. The river water was considered holy and used by some churches for cleansing as well as baptism. In Tswana culture, the river is also sometimes a place for rainmaking ceremonies. For people staying along the river, it became the extension of the lapa being used to host family functions like weddings usually with an open invitation to the community. This open space allows children to play freely under a watchful eye of elders while also providing ample space for parking and erection of shade structures. On a typical day one can hear and see birds and livestock coming down to drink water and find shade under larger trees while herd boys play soccer on the green veld grass. In many African traditional communities, fetching water from the river was done by women helped by young girls (Figure 1). The river was a place where they can be free and share their secrets away from men, while sometimes it was a place where new love was found as men went to water their livestock. In this sense it allowed individuals to perform certain duties like rituals and religious activities which contributed to the formation of their individual identity, which is based on their place in the society, while forming a shared identity for the community.

In time, settlements often grew and extended over these rivers. In some areas, the in-between spaces along rivers were later neglected, then polluted, while new developments faced away from them. Currently these spaces are characterised by pollution (land, water and air), overgrown vegetation and crime among other negative features. It is therefore evident that there is need for research and experimentation in appropriate planning, design and management of these spaces to improve the current situation. It is submitted that any landscape design of such spaces should start and end with an understanding of the significance that the environment holds for the people, as well as the potential for a sustainable relationship that ensures a deeper meaning in ecological and cultural systems that contribute to a sense of place and community in the future.

Figure 1: People using Pienaar's River as a source of water and a place to relax, Mamelodi (Author, 2011)

1.2. STUDY AREA

The study calls for a green open space that has the potential to become a place for a shared sense of community in Tshwane. The area of study, Mamelodi (Figure 2), is a township within the greater City of Tshwane Metropolitan Municipality (CoTMM). Because of its rural quality, it still has large green open spaces along the Pienaar's River. Unfortunately these are neglected and do not contribute to the image or the spirit of this otherwise vibrant township.

1.3. PROBLEM IDENTIFICATION

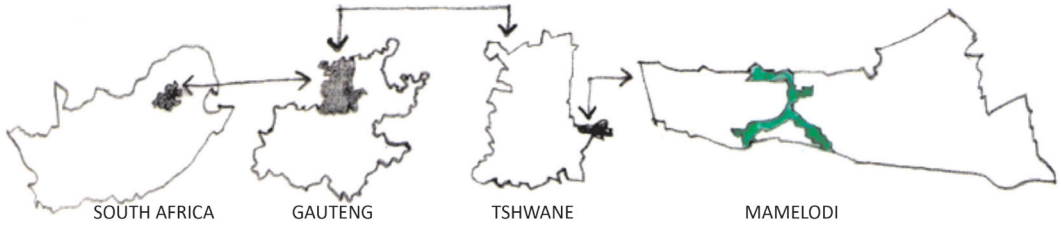


Figure 2: South Africa: location of study area, Mamelodi (Author, 2011)

1.3.1. Real-world problem

Today the landscape along rivers in Mamelodi fragment communities and have become culturally insignificant, lost spaces. This contributes to the disintegration of the community as people refrain from crossing these spaces and do not interact with people from the other side of the river, or use the abandoned spaces. These spaces have become hazardous in terms of safety and health as well as becoming hosts to undesirable behaviour in the community (Figure 3).

Figure 3: Children playing in rubbish dumped adjacent to Pienaar's River,Mamelodi (Author, 2011)

1.3.2. Problem statement

The current state of the Pienaar's River (also known as Moretele River in Mamelodi) is not contributing to a safer, cleaner and productive environment for the community of Mamelodi. The question is; how can a landscape intervention bring meaning to these spaces and ignite a spirit of community that would become a catalyst for community development and socialisation?

1.3.3. Specific problem for the thesis

Do green public open spaces along rivers in Tshwane hold any significance to the communities residing along the river?

1.3.4. Research question

This study attempts to answer the question:

- How can river landscapes be designed to attract, connect, activate people's lives and improve a sense of community in Mamelodi?

Sub-questions

- Why are designed green public open spaces important to form and integrate a sense of community?
- How can designed green public open spaces facilitate and act as catalysts for community socialisation and development?
- How can green public open spaces benefit from river ecology and contribute to a harmonious relationship between nature and the township inhabitants?
- What is the potential role of urban rivers in Tshwane townships, with reference to Mamelodi?

1.4. HYPOTHESIS

When a landscape intervention respects the spirit of a place, reflects people's identity, values and allows for the expression of their cultural practices, it can add to a shared sense of community. This river still has the potential to be a meaningful community space. The reclaiming of the river's edge in Mamelodi as a functional urban space, can inspire a healthy and productive human environment.

1.5. AIMS OF THE STUDY

To design an appropriate landscape proposal that can improve a sense of community and the relationship between people and the environment, the project aims to:

- Explore the Greenways concept and its significance applied at a regional scale;
- Investigate sustainable strategies for the rehabilitation of the river system;
- Explore sustainable strategies for the economical development of the community;
- Investigate connectivity to surrounding areas and significant places in the township through a designed circulation network;
- Present the river system as a meaningful place for recreation, interaction, socialisation and contemplation by designing and activating social spaces that can cater for cultural events and everyday life interactions that can bring people together.

1.6. CLIENT

The City of Tshwane (CoT) is the owner of the study area and the Open Space Planning Section under the Agricultural and Environmental Management Division is identified as the client.

1.7. LIMITATIONS AND ASSUMPTIONS

The project will limit itself to the study of the environment along Pienaar's River in Mamelodi and the immediate adjoining community in terms of the design problem definition and objectives. The study assumes that:

- Interventions along the Pienaar's River will be approved by CoT.
- The increased population will lead to urbanisation of the area as shown in Mamelodi / Nellmapius Masterplan, Tsososloso. Programme, by GAPP Architects and Urban Designers (2010) and the landscape intervention will contribute to the image and value of the area.

1.8. RESEARCH METHODOLOGY

The study will respond to quantitative available information (e.g. statistics) and follow a qualitative research strategy in introducing and discussing the project site in Mamelodi.

The author will consider four key components suggested by Groat (Groat & Wang, 2002:176-7):

1. An emphasis on natural setting which entails the observation and interaction with objects of inquiry at the area of study, (The author gets information through interviewing community members living along the river about their opinions and taking photographs of the current conditions of the site)
2. A focus on interpretation and meaning to make sense of the available information and initiate the process of analysis (The author then produces analytic diagrams to communicate the conditions and characteristics of the site.)
3. A focus on how the respondents make sense of their own circumstances (Patterns and activities existing on site are also mapped while paying attention to how people use the spaces.)
4. The use of multiple tactics including photographs, sketches and a physical inventory of the site (Finally the author combines and integrates the above mentioned methods to understand the site and inform design.)

To propose a site specific intervention, the author will first introduce the site in context and the regional planning frameworks that will inform the design. Frameworks are developed and informed by both contextual analysis and the theoretical research to respond to the identified design problem in the study area. The proposed regional and local frameworks assist in developing design guidelines to steer the design process. The author uses the precedents and case studies to compile a list of design principles to be followed in the sketch plan design. The sketch plan area attempts to prove the hypothesis of a meaningful, healthy and productive human environment. The technical detailing of this area ends with a brief study of the materials selected and sustainability rating of the project.

CHAPTER

2

CONTEXT

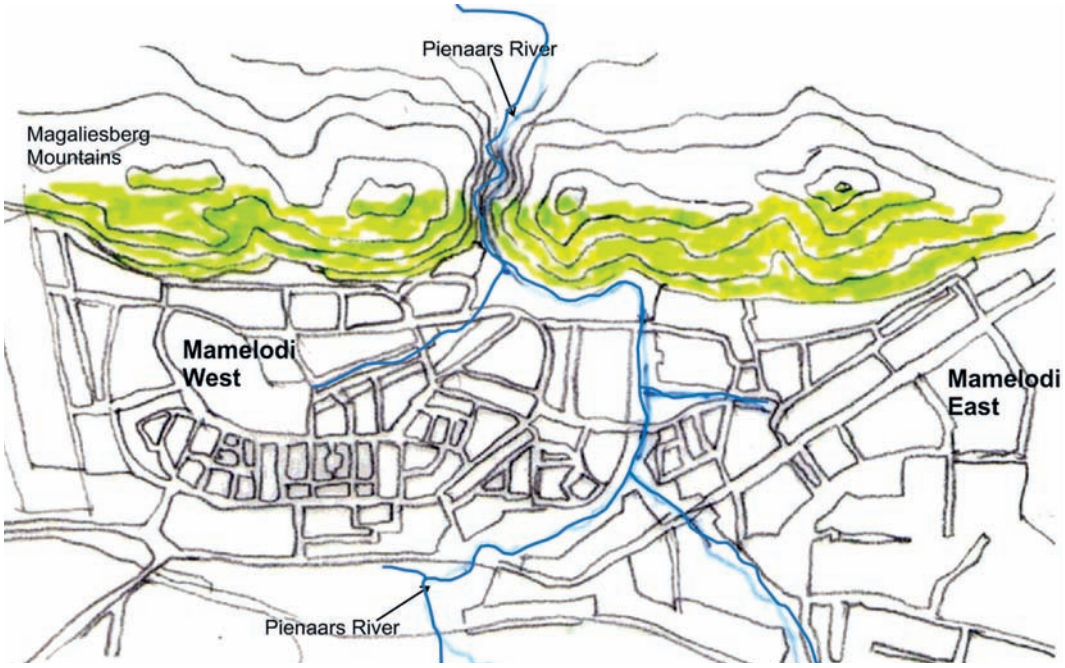


Figure 4: Location of Mamelodi in relation to the Magaliesberg Ridge (green) and Pienaar's River (blue) (Author, 2011)

2.1. BIOPHYSICAL CONTEXT

Mamelodi is in the east of the greater CoT in Gauteng Province, South Africa, and sits at the foot of the Magaliesberg Range which forms its northern boundary. It spreads in an east-west direction and gets split into Mamelodi East and Mamelodi West by the Pienaar's River (Figure 4). Pienaar's River forms the catchment basin for Mamelodi with all tributaries flowing to the north, merging at the Magaliesberg and running through a 'poort' to the north. The framework and design will therefore respond to the river as both an element acting as a boundary between the west and east as well as its function as a catchment basin for the township.

2.2. HISTORICAL CONTEXT

The name Mamelodi is of Tswana origin and directly translates to 'mother of melodies'. According to Walker and Van Der Waal (1991:3-4), the founding of Mamelodi was on 30th October 1945 when the Pretoria City Council (PCC) bought parts 2 and 3 (Figures 5) of the Vlakfontein 329 JR farm land for the purpose of laying out a black urban area. Development started west of Pienaar's River in part 3 (Figures 6). As the population grew and Mamelodi West, became fully occupied, the settlement expanded over the Pienaar's River which was initially the eastern boundary of the township (Figure 7). According to Chiloane (in Walker & Van Der Waal, 1991: 5) it is estimated that 80% of residents of Mamelodi moved into the township from locations of Bantule, Eastwood and Lady Selborne. These people were relocated by the apartheid regime. They were then grouped according to race and ethnicity and the development of 'boundaries' between neighbourhoods. This is still evident today as people have continued to stay in ethnic groupings and this has sometimes contributed to clashes.

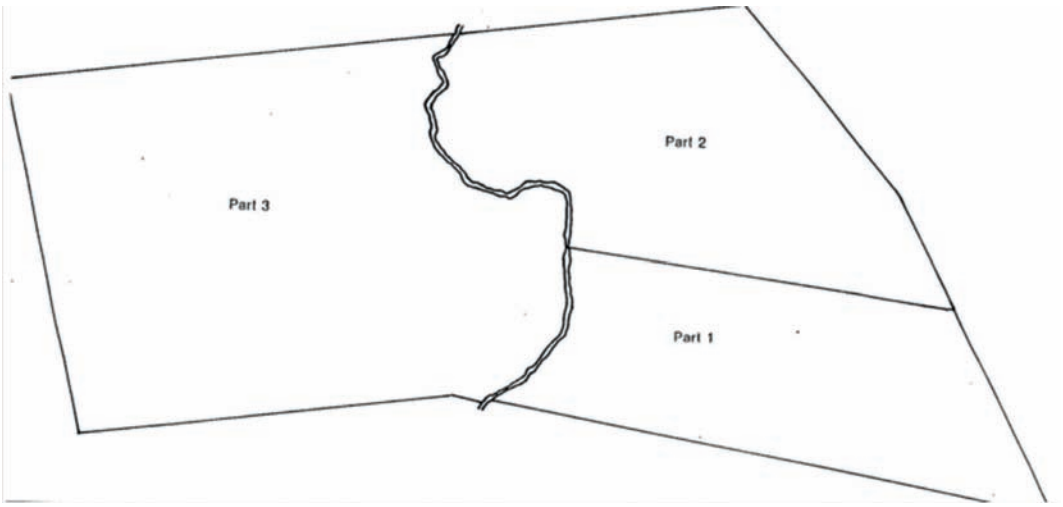


Figure 5: Subdivision of the farm Vlakfontein 329 JR during the 1870s showing Pienaar's River cutting North-South (Walker & Van Der Waal, 1991)

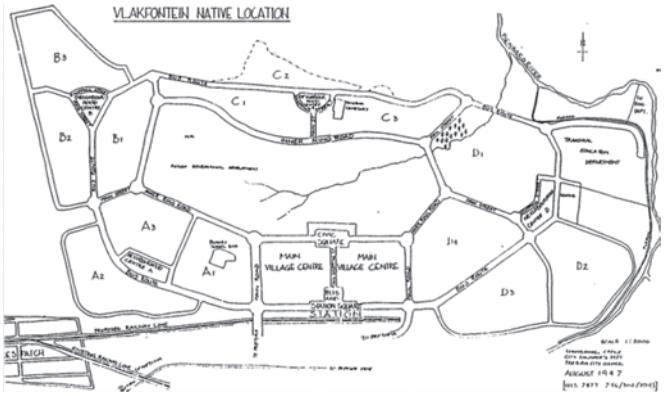


Figure 6: Vlakfontein Native Location: layout in 1947 showing Pienaar's River as the Eastern edge (Walker & Van Der Waal, 1991)

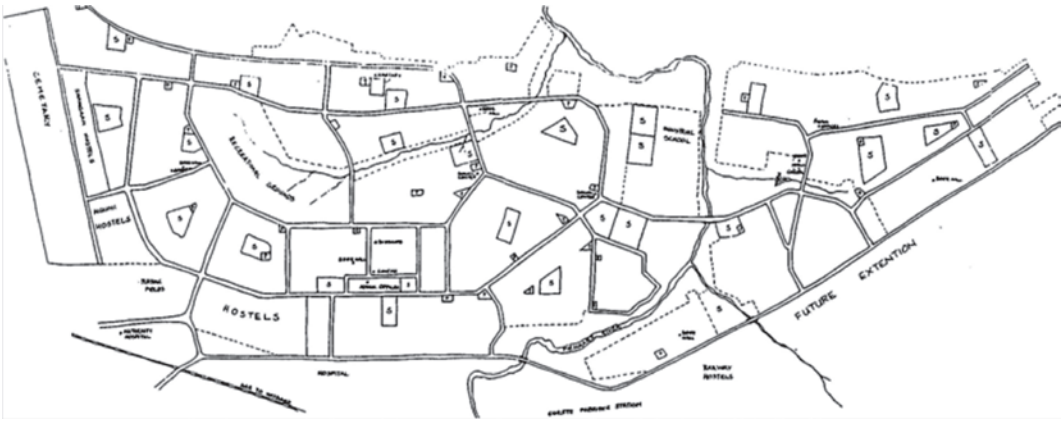


Figure 7: Mamelodi: situation in 1961 showing extension over Pienaar's River (Walker & Van Der Waal, 1991)

Figure 8: The first housing in Mamelodi showing lapa system (Walker & Van Der Waal, 1991)

The building of Mamelodi began in 1947 with the lapa scheme applied here by use of Rondavels (Figure 7). The term lapa refers to a Tswana spatial organisation concept of a "walled public courtyard that connects the area in front of the principal houses of a family homestead. This is the place where visitors are received, and in many respects it plays the same role as a living room in Western houses" (Denbow & Phenyo, 2006: 94-95). Dintlo (houses) surround the lapa as bedrooms would do around a living room. It can therefore be assumed that the first black inhabitants included the Tswana who spend most of the day in the lapa where most (if not all) day chores were carried out. The author feels that the idea of the lapa could have been better explored here as it forms the most important aspect of Tswana planning and will therefore attempt to bring this out in the proposed design.

The charms of the new Rondavels did not seduce the users who condemned them as "primitive kaffir housing … which was causing considerable racial conflict and feelings of hostility" (Pretoria News in Walker & Van Der Waal, 1991: 10). The author concurs with these comments as people leave rural areas (e.g. villages) and come to urban areas for a better standard of living as well as to enjoy services (e.g. water and electricity) and even luxuries (e.g. parks) which they are not getting where they come from. Moving the 'village' to the city by direct translation of the Tswana lapa was therefore inappropriate and demeaning. The lapa layout was later replaced by four-roomed houses. Other important historical places around the area of study that contributed to the growth, vibrancy and culture of Mamelodi include:

- Moretele Park (10 in Figure 9)
- Vlakfontein Industrial School (14 Figure 9)
- Old Rondavels (15 Figure 9)
- Government Guest house (19 Figure 9)
- Beer Hall and Mthunzini Park (8 in Figure 9)

Community facilities are mostly concentrated in Mamelodi West as it was the first location. Mamelodi has many schools, some with a history as old as the first buildings in Mamelodi, around the Rondavels area opposite Moretele Park Resort. These places contribute to a sense of place and can further be investigated and enhanced as public spaces and facilities where they may possibly to contribute to the identity and spirit of the community. Moretele Park, situated where Pienaar's River meets the Magaliesberg, is well maintained and enclosed.

Figure 9: Mamelodi historical Sites (Cadre Plan, 2000)

2.3. STATUS QUO

According to Darkey (2000: 9), "the Pienaar's River and flood plain including the smaller tributary which joins the system, performs an important physical and ecological function. Among others, it provides an environment of food resource for birds, frogs and insects, thus making the area an ideal future urban open space conservation area." Originally, Pienaar's River was a very important source of water for the township as well as the farm(s) that existed there. "Laundry was done in the river and dried on large flat stones which are still there. Once the washing was completed, one often washed oneself as well. Water for the house was also taken from the river (Walker & Van Der Waal, 1991: 15)." These authors paint the picture of a positive environment that people would like to live in. It contributes to the community at environmental and social level. Unfortunately, today these attractive attributes and benefits have been lost. The river has now become a deserted boundary of unmanaged and underutilised open spaces (green space in Figure 10).

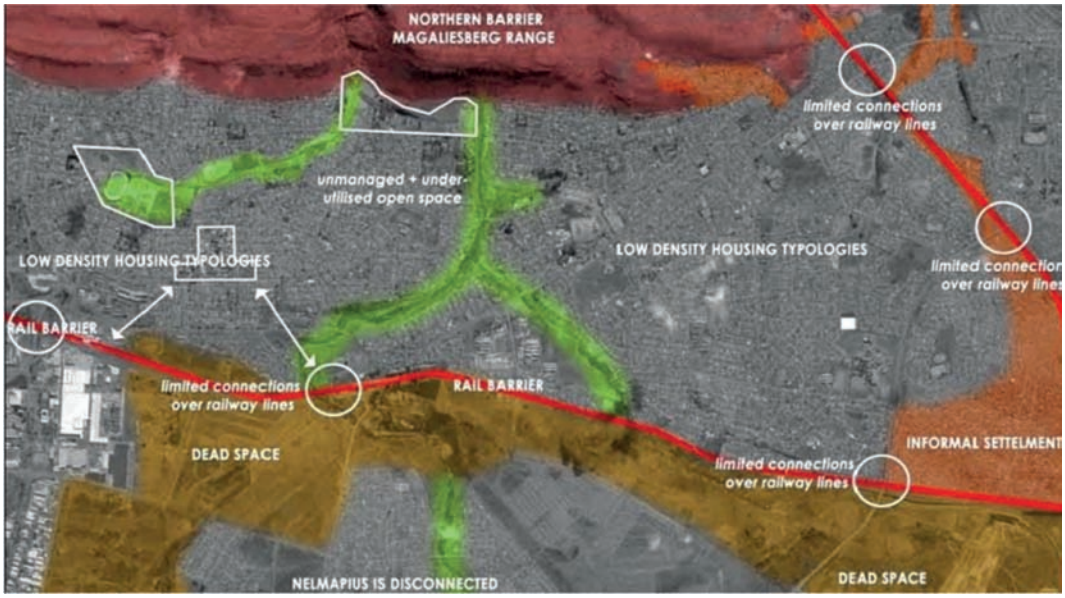


Figure 10: Mamelodi physical constraints (GAPP, 2010: 20)

Figure 11: Panorama of Pienaar's River: relationship of settlement to the river (Author, 2011)

2.3.1. Pienaar's River as physical and social boundary

The growth and/or increase in population has put pressure on the natural resources. The Pienaar's River has suffered the most as a 'no man's land' and has since been transformed and degraded (Figure 11). The current state of the river is undesirable in that:

- Pienaar's River forms a major unmanaged and underutilised green open space covered with veld grass and devoid of trees in Mamelodi. The riparian vegetation throughout the area is fairly disturbed, consisting of mostly alien vegetation species (African EPA, 2007: 26);
- Flooding of the river has in the past resulted in children drowning while trying to cross it;
- It has become a place for storing dangerous weapons, mugging as well as murder thus a place of danger;
- It is now an 'informal dumping site';
- Most of the neighbourhood parks along the river have be neglected by the community;
- Water is polluted with waste from backyards and oil from informal vehicle repair and parking spots among other things
- Minimal and inappropriate agricultural practices which include growing of maize with no irrigation leading to insignificant harvest, not even providing enough for family consumption.
- Sedimentation has led to the proliferation of reeds in the channels of some areas while habitat integrity has been critically impaired.

The author's visits to the site proved that the space is a social boundary largely contributed to by the above mentioned issues. The connection between people and people and the environment has deteriorated to a point where the community and the public spaces, most importantly the river, has become unproductive, unhealthy, unsafe and hazardous to its people. Apart from two major vehicular crossings and three pedestrian bridges north of Eerste Fabrieke Station, Mamelodi west is completely separated from the east. The current situation of the river is unsustainable and does not nurture the spirit of togetherness between the neighbouring communities.

2.4. INSTITUTIONAL CONTEXT

Institutional frameworks serve to guide interventions on spaces that fall within areas that have already been studied and development guidelines set to inform future projects. The Magaliesberg and the Pienaar's River form two major natural elements that this study will deal with, therefore a look at Tshwane's policies on these is necessary. The proposed design will make reference to and be guided by the frameworks while proposing other options that might compliment the existing frameworks.

2.4.1. Tshwane Open Space Framework

According to the Tshwane Open Space Framework (TOSF), (TOSF Vol 2, 2005: 4), the vision for the framework is to create a sustainable Open Space network which provides the setting for the capital city, is of a high international standard yet based in the African context, empowers the community to prosper in a safe and healthy environment, and protects the integrity of its ecological systems. The author argues that although these are attainable goals, most of the time they end up as mere policies which CoT still fails to implement especially when it comes to larger green open spaces. It mentions Moretele Park Recreation Resort as one of the catalyst projects that need upgrading but such projects fail to contribute to the everyday life of the local community who cannot afford to access the park (a fee is required to enter). The alternative could be to open the park(s) to the public and maybe have regular events that the people can pay for at affordable prices suited to the Mamelodi community and not only tourists. The community need to feel that they own these places rather than being kept for outsiders, consequently they need to be involved in the development and running of such facilities. TOSF proposes green and blue (ecological importance e.g. in Mamelodi there is Magaliesberg Ridge and

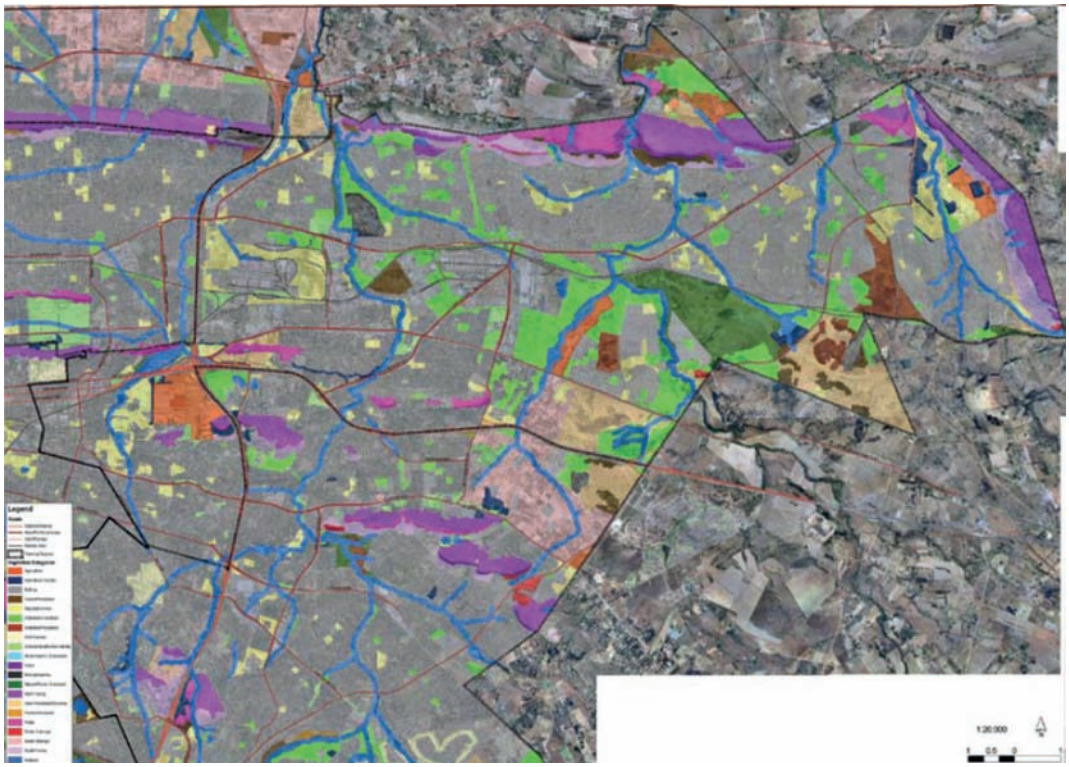


Figure 12: Mamelodi: Open Space Plan (TOSF Vol 2, 2005: 69)

Pienaar's River), red (Placemaking importance) as well as brown and grey (social and civil infrastructure) nodes and ways for different features depending on their functions (Figure 12). The TOSF still separates man from nature and the proposed interventions in the ecological areas tend to always be for conservation only and do not contribute to empowerment of the community.

2.4.2. The Mamelodi / Nellmapius Master Plan

According to GAPP (2010: 2) The Mamelodi / Nellmapius Master Plan (MNMP) is the pilot project of the Tsosoloso Programme which was initiated by the CoT Metropolitan Municipality in 2005 to identify and address structural planning issues that were deterring investment in *disadvantaged* areas of Tshwane. The five proposed strategic outcomes of the Tsosoloso Programme are to (ibid: 2):

- Create community activity centres and focal points (nodes);
- Strengthen activity linkages (spines/corridors);
- Transform transport interchanges into civic termini;
- Enhance the pedestrian environment;
- Enriching the public environment.

In the Composite Regeneration Strategy (GAPP, 2010: 18) of proposed strategic outcomes (above), the interventions are grouped according to the following urban structure elements (Figure 13):

- Nodes (red)
- Activity spines (blue)
- Public open space/public environment (green)

Figure 13: The City Structuring Model as it Applies to the Composite Regeneration Strategy (GAPP, 2010: 18)

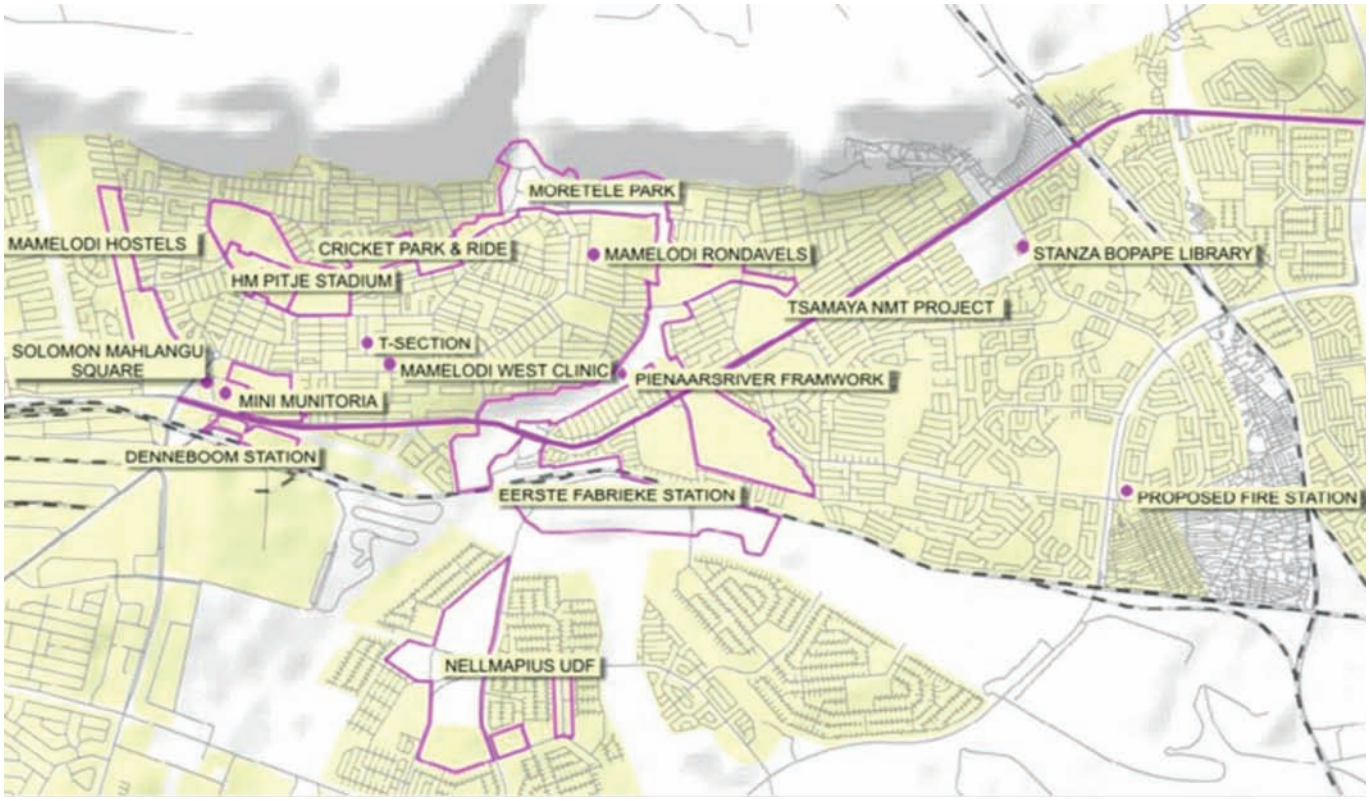


Figure 14: CoT Project identification (GAPP, 2010: 82)

According to GAPP (2010: 43) the current green open space planning proposals for Mamelodi include (Figure 14):

- Local Open Space Plan for Mamelodi West and East (Chapter 2.4.3.)
- Pienaar's River Rehabilitation Framework (Chapter 2.4.4.)
- HM Pitje Stadium Complex upgrade and
- Moretele Park Redevelopment.

The strategic outcomes could be exciting for the community and the author intends to take them up to inform design but one may question the magnitude of the foreseen developments and the effect it would have on the current identity of Mamelodi. The author argues that sometimes change needs to take time and be in sync with community aspirations and the public open spaces might be a good starting point. This study concurs with TOSF and MNMP on the redevelopment of Moretele Park but they are both still limiting it to a simple face-lift of the park and no integration with the larger Pienaar's River system and its contribution to the community. The author also questions the missing historical layer in the proposal. Historical elements can form community activity centres and focal points and contribute to a sense of place, something that the author intends to investigate further.

Figure 15: Mamelodi West LOSP (Loots 2007: 19)

2.4.3. Mamelodi West Local Open Space Plan (LOSP)

Mamelodi West LOSP (Figure 15) is based on and supports the above-mentioned TOSF in a more detailed decision making aspect. It also identifies different open space typologies according to the TOSF colour typologies. Its aims and principles are:

1. It should protect the natural heritage of the area (ecological objective).
   - Protect the integrity of natural ecological elements;
   - Protect the natural element as major visual structuring elements in the area;
2. It should enhance the character and identity of the area and protect the cultural heritage of the area (placemaking objective).
   - Enhance gateways to the area through appropriate built structures and landscaping;
   - Celebrate unique elements by establishing dignified and beautified spaces around them;
3. It should provide conveniently accessible and sufficient recreational space for the people (socio-economic objective) of the area.
   - Provide safe local parks in close proximity (approximately 400m) of all;
   - Provide adequate multi-purpose recreational spaces;
   - Establish a network of safe and convenient routes for pedestrians and cyclists to use for recreation, as well as everyday use (Loots, A. 2007: 17-18).

Mamelodi West LOSP provides a good foundation upon which this study can be supported because of clearly defined achievable aims and principles. It recognises ecological and social elements in the township that can improve community life while also conserving nature. However, it lacks economical potential of these open spaces.

2.4.4. Pienaar's River Rehabilitation Framework

The framework site was limited to the river and immediate surrounds (i.e. within 100 meters of the river bank). The following areas were identified as problems that proposed interventions focused on:

1. Waste management (large volumes, poor management resulting in dumping, lack of community awareness);
   - prevent vehicular access to open areas
   - waste transfer stations
   - waste buy back & recycling centres
   - formalise open spaces
   - placement of bollards along open space boundaries

2. Storm water design & position (outlets discharge directly into the stream, high velocity, no erosion protection, siltation);
   - outlets to be moved outside of floodlines
   - flow reducers, settling/retention ponds & wetlands

3. In stream conditions (bank profile, erosion, siltation, alien vegetation);
   - bank re-profiling (not needed in nodal focus area)
   - gabions
   - silt traps and wetlands to capture silt

4. Lack of planned open space & community involvement (lack of facilities, pedestrian circulation, parks, lighting);
   - encourage pedestrian circulation
   - ensure adequate lighting
   - create opportunity for open space usage
   - incorporate community
   - ensure alignment with Mamelodi West LOSP
   - community farming
   - use of parks and biodiversity hotspots by schools (African EPA, 2007: i and Siyakhana Initiative, 2010: 7).

Pienaar's River Rehabilitation Framework adds to the Mamelodi West LOSP. It goes a step further by laying down some detailed planning solutions (Figure 16) to the problems facing the river. It also helps in focussing the vision and aims identified so far into applicable physical interventions at a regional scale. This is essential to informing the local framework for this study that will be developed by the author. One important aspect mentioned by the rehabilitation framework is community farming which if explored can really contribute to the socio-economic upliftment of the people of Mamelodi.

Figure 16: Pienaar's River Rehabilitation Framework intervention zone 1 (African EPA, 2007)

2.5. LEGISLATION

2.5.1. National Water Act (Act No. 36 of 1998)

The Pienaar's River Rehabilitation Framework (mentioned above) also proposes some alterations to the stream and banks that fall under Section 21 of the National Water Act (NWA), 36 of 1998 which considers such alterations as a water use. Section 21 includes the following activities:-

1. taking water from a water resource
2. storing water:
3. impeding or diverting the flow of water in a watercourse:
4. engaging in a stream flow reduction activity contemplated in section 36;
5. engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1):
6. discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit:
7. disposing of waste in a manner which may detrimentally impact on a water resource;
8. disposing in any manner of water which contains waste from or which has been heated in any industrial or power generation process;
9. altering the bed, banks, course or characteristics of a watercourse:
10. removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people: and
11. using water for recreational purposes.

An obvious structure that could be affected by this regulation, would be the proposed pedestrian bridges linking the west and the east banks of the river. This would fall within Section 21(c) on impending or diverting the flow of water in a watercourse. In this case impending flow could mean any obstruction that the bridge would cause across the river and/or within the floodlines that might affect its course. Section 21(i) would also be affected by the afore-mentioned example as well as in situations where the floodline are affected by the development.

2.6. CONCLUSION

The author believes that the Pienaar's River can be rehabilitated in an attempt to solve some of the issues that continue to divide people of this township. Some of the most pressing issues in the study area include open space planning and conservation, waste and stormwater management, agriculture and community development as well as integration with recreation and education. This study will address some of the proposed solutions in these frameworks and also propose ways of planning the spaces for optimal use by the community. The proposed intervention should bring back the 'historic' meaningful interactions between people and nature and the appreciation for the latter while staying relevant to current issues.

CHAPTER

3

THEORETICAL FRAMEWORK

3.1. INTRODUCTION

The relationship between people and their environment has been investigated extensively in the past by researchers from different fields including anthropology, sociology, psychology and many more. Moran (in *People and nature: an introduction to human ecological relations,* 2006) reminds us of the different interactions between humans and their environment; hunter gatherers, the farmer, urban-industrial revolution and contemporary human-dominated ecosystems. According to Murphy (2005:25), landscape architecture theory is based on the premise that quality of life for individuals and society benefits from the creation of harmonious and mutually supportive relationships between people and the environment. Whereas the author concurs with this hypothesis, he intends to investigate and explore possibilities of elevating this spirit of 'support' that brings meaning to the landscape as well as the users' being. Thompson (1999: 6) argues that the main sources of positive values in landscape architecture are to be found in three areas – the aesthetic, ecological and the social. While the author agrees with Thompson, the author believes that if people are separated from beauty and ecology they will not appreciate them and contribute to the conservation and sustainability thereof. It all begins and end (Figure 17) with people because they are the ones who use the spaces designers create therefore they will affect them one way or the other. If design and planning was to start with the social aspects (community) and from there on look at ways of encouraging people to live with and respect the beauty in nature, it would result in successful design.

In this chapter, the author will firstly present a brief overview of community design, a theory presented in a book called *Community by design: new urbanism for suburbs and small communities* by Kenneth A. Hall Jr and Gerald A. Porterfield, 2001. Mr Hall specializes in community planning while Mr Porterfield a renowned speaker on land development issues. They are both landscape architects and members of the American Society of Landscape Architects (ASLA). The author will also explore the theory in creating a sense of community and how the landscape can connect the community to a place. The author will then introduce, define and discuss place theory as well as elaborate on the use of the space in connecting people with one another, the community and the environment in a way that enhances their relationship.

Figure 17: The interaction between the community and the landscape architect at Moroka Park, Soweto (Young, 2008).

3.2. COMMUNITY DESIGN THEORY

According to Hall and Porterfield (2001: 3), community design is the art of making sustainable living places that both thrive and adapt to people's needs for shelter, livelihood, commerce, recreation and social order. In landscape architecture, community design can create designed open spaces that better respond to daily life and culture of the users. Open space, the seemingly void zone between vertical elements, can be perceived as positive, productive, planned, and functionally supportive or, conversely, as negative, wasted, unstructured and deleterious (Hall & Porterfield, 2001: 19). In designing for communities, open space must be viewed as the most important component and a starting point for a successful public space. These include ecologically important green spaces usually preserved as well as programmed activity areas like parks. A successful public space should contribute to the well being and health of the people as well as accommodate cultural and community activities in a safer environment. It should also contribute to strengthening of the identity of place and the relationship and connection to other public spaces and nodes in the larger community. According to Hall and Porterfield (2001: 19), if the viewer can perceive open space as a part of a larger composition, one that heightens the relationship of the other elements in that composition, then that space has been successfully designed. To address this theory, the author intends to develop the catalyst project as part of a larger productive landscape which also links to other community facilities.

3.2.1. Sense of Community

According to Stewart and Strathern (in Muller, 2009: 34), community refers to sets of people who may identify themselves with a place in terms of notions of commonality, shared values or solidarity in particular contexts. These values could be informed by the spirit of *botho* which is itself a community value. Other values include among others service, charity, respect, togetherness, and hospitality. According to McMillan (1996: 323), some community stories represent the values (courage, wisdom, compassion and integrity) and traditions. These stories can also contribute to the creation of meaningful open places. The author will therefore take this definition as a starting point in exploring deeper meaning in creating and improving a sense of community in open space design. One of the most important goals of landscape design should be to improve the quality of life of people in the surrounding community. This can happen if the sense of community is enhanced. Beatley and Manning (in Newman & Jennings, 2008: 50) define a sense of community as a sense of ownership, commitment, and a feeling of belonging to a larger whole. These can be expanded as meaning that members of the community feel that they own the public space and therefore are responsible for taking care of it and monitoring what happens in their area. By committing oneself to a community you are therefore trusted with protecting as well as championing for a better life of the whole.

According to Prezza et al (2001: 30), many studies demonstrate that sense of community is related to active participation in community life. This could include sports and recreation, farming, weddings and parties, security initiatives (e.g.

nightwatch), church and many events open to the public. All these require some sort of public open space for cultural expression and socialisation. Taking the above mentioned community elements into consideration in the design of open spaces for socialisation can result in places that are not only understood by people but mean something to them as a society and their interaction with one another.

3.2.2. Place Making

Place making is used to refer to the creation of environments with a unique sense of place while they express the unique nature of their natural and cultural setting (Behrens & Watson, 1996:10-11). This includes response to biological, physical and historical context not in a pastiche way but reflecting application in modern forms. The designer needs to explore and understand human characteristics of a particular place. According to Behrens and Watson (1996:11), different places offer different life experiences, and these experiences mould peoples' perceptions, values and self identity.

According to Stewart and Strathern (in Muller, 2009: 34), a place is a socially meaningful and identifiable space to which a historical dimension is attributed. In the proposed design for this study, the author will work with the existing historical fabric that can be easily identified with and encourage interaction of the community (Figure 18). Sense of place, as explored in the publications of Trancik (1986), Behrens and Watson (1996) as well as Newman and Jennings (2008), is considered an integral part of place making in the design of the environment. If in abstract, physical terms, space is a bound or purposeful void with the potential of physically linking things, it only becomes place when it is given a contextual meaning derived from cultural or regional content (Trancik, 1986: 112). According to Coetzee and Roux (1998: 17) in culture one finds the values, norms, beliefs, and meanings which make life within a specific community possible and meaningful… one would consider meaningful systems like religion, traditions, customs, political practices, economic behaviour, and so on, as subsystems of culture. The author believes that these are very important aspects of culture inherent to the specific environments.

Figure 18: Parks are for people: a great meeting place for the community at Thokoza Park, Soweto (Young, 2008).

3.2.3. Open Spaces as Community Places

The importance of public open spaces throughout the course of history is indisputable (Hall & Porterfield, 2001: 227). Historically different cultures, although using these spaces differently in some aspects which also dependent on whether it is a rural or urban setting, have shown appreciation for these spaces. According to Hall and Porterfield (2001: 227), they were the social heart of their communities and as such were usually the site of the more significant buildings e.g. churches, guild halls, civic halls and prominent dwellings. From a Tswana perspective, the open spaces were the dominant element while buildings became mere rooms for storage of goods. These were, and still remain in some areas especially in Botswana, great places contributing to a shared sense of community. This notion of community life in the open public spaces is also shared by *Project for Public Spaces* (PPS)'s place making approach which starts from the premise that successful public spaces are lively places where the many functions of community life take place, and where people feel ownership and connectedness — true common ground (http://www.pps.org/parks/approach/). The project in the study area should benefit the community by creating and promoting great people spaces (Figure 18). The design will among other elements create open spaces for seating and gathering. The design project should attempt to meet this 'criteria' provide public spaces for social events that promotes the spirit of togetherness especially around community facilities like churches and halls.

Figure 19: The Benefits of Place (PPS, 2003)

3.3. NORMATIVE POSITION

The current obsession in landscape architecture and other professions of the built environment with sustainability cannot bear any significant fruits if they continue to fail in integrating the ecological process with the cultural aspects of the community. The creation of meaningful places that contribute to the revival of a shared sense of community could, in agreement with Newman and Jennings (2008: 144), provide insights on pathways to sustainability that are both acceptable to the people and compatible with their values, traditions, institutions, and ecological realities. For sustainable strategies to work, designers need to understand people's values and needs as well as the appropriate manner in which any solution brought in ought to work in response to their everyday life, the tangible and intangible aspects and the aspect of history and time; past, present and how it should affect their future. According to Stewart and Strathern (in Muller, 2009: 34), landscape refers to the perceived settings that frame people's senses of place and community. This project aims to highlight these settings.

The author agrees with the statement by Prezza *et al* (2001: 33) who claim that on the whole, there are not many in-depth studies on the relations between sense of community and urban planning, architectural and social characteristics of the community. Designs in the landscape e.g. parks, have also shown very little (if any) interest or exploration on the potential of the spaces in adding to a sense of community instead of being typical fields, play equipment, braai areas and pathways for jogging sometimes with no meaning or relevance to the community and place.

3.3.1. Meaningful landscape design

In creating meaningful landscapes, designers attempt to highlight some ideas and values that are significant to the users and site. Usually this is done through the design of form and spaces they create or the way in which the user will experience that space. The meaning becomes clearer as people begin using the spaces, contemplating and engaging with them. The role of meaning in landscape design has been explored in Simon Swaffield's (editor) *Theory in Landscape Architecture*, 2002. According to Swaffield (2002: 5), there are two contrasting positions in Landscape Architecture; on one hand, the discipline should explore fundamental relationships among culture, technology, and nature through meaningful design, on the other hand there is the view that the essence of the discipline lies in creating healthy, functional, and pleasurable places for communities and to which significance and meaning will accrue over time. The author concurs that, designers should explore meaning, usually from site's history, of designs if it is to be understood and appreciated by the user but can also at the same time allow for new layer/s of meaning to the current users.

Whereas it is not easy to accommodate all cultures in urban landscapes, rural and semi-rural landscapes afford us the opportunity to explore this as they usually have the same traditional values and history. "Folk cultures produce places that are almost immediately communicative, and communicative over long periods.

Because their connections between form and intention are understood within the culture and evolve only slowly over time, it is possible for the makers, the people, and the meaning of place to remain in contact (Treib in Swaffield 2002:99)." It is therefore feasible to investigate this further in the chosen area of study, Mamelodi, as it has that rural character. In arguing that landscapes can be designed by creating comfortable and functional spaces, Treib (in Swaffield 2002:101) states that it would seem that a designer could create a landscape of pleasure that in itself would become significant. This would shift the aim from trying to create a meaningful place from the onset but design spaces for activities that encourage and provide pleasurable and sometimes repetitive experiences that would add a new meaning on the landscape that the users readily associate with.

The author submits that while history of place brings meaning to landscape design, it can also emerge from new use and customs which change over time. This in turn also makes meaning dynamic. In this project therefore, the spaces should not concentrate on attempting to blatantly add meaning into the design but more on creating spaces that allow significance to accrue over time while functioning well and being pleasurable spaces today at both masterplan and sketch plan area.

3.4. CONCLUSION

The relationship between people and the environment, expressed in landscape design in natural and cultural process and activities can lead to a *systems aesthetic* that contributes to the enhancement of a unique *sense of place*. The created spaces add to enriched and meaningful places that form a society's identity and add to a shared sense of community. This cyclic connection between people in communities as well as people and the environment in which they live therefore should be explored and be part of the normative position if the designed landscape is to appeal and contribute to local people's health and well being. Community design could result in spaces where local people can interact and be inspired by the culture and history of their community celebrated and enhance in the created places. The proposal for the study area should therefore result in a great place that can nurture the spirit of the community. The landscape intervention should respect the spirit of a place, reflects people's identity and allow for the expression of their cultural values and practices so it can inspire meaningful, healthy and productive connections in the community.

CHAPTER

4

SITE IN CONTEXT

4.1. INTRODUCTION

For a meaningful placemaking and community design, an understanding of the site in context is necessary to a suitable setting and design of different spaces for different uses and activities. The choice of which attributes to map is dependent largely on the existing conditions and objectives of the study. This chapter first introduces the objectives of the analysis and presents the biophysical and cultural aspects of the project site in context as well as the community needs that must be addressed. It will then synthesize the information by highlighting the opportunities and challenges that the project faces. The chapter will conclude by summarising the analysis and also showing that it can and will be used to inform meaningful and sustainable landscape intervention for the community.

4.1.1. Objectives

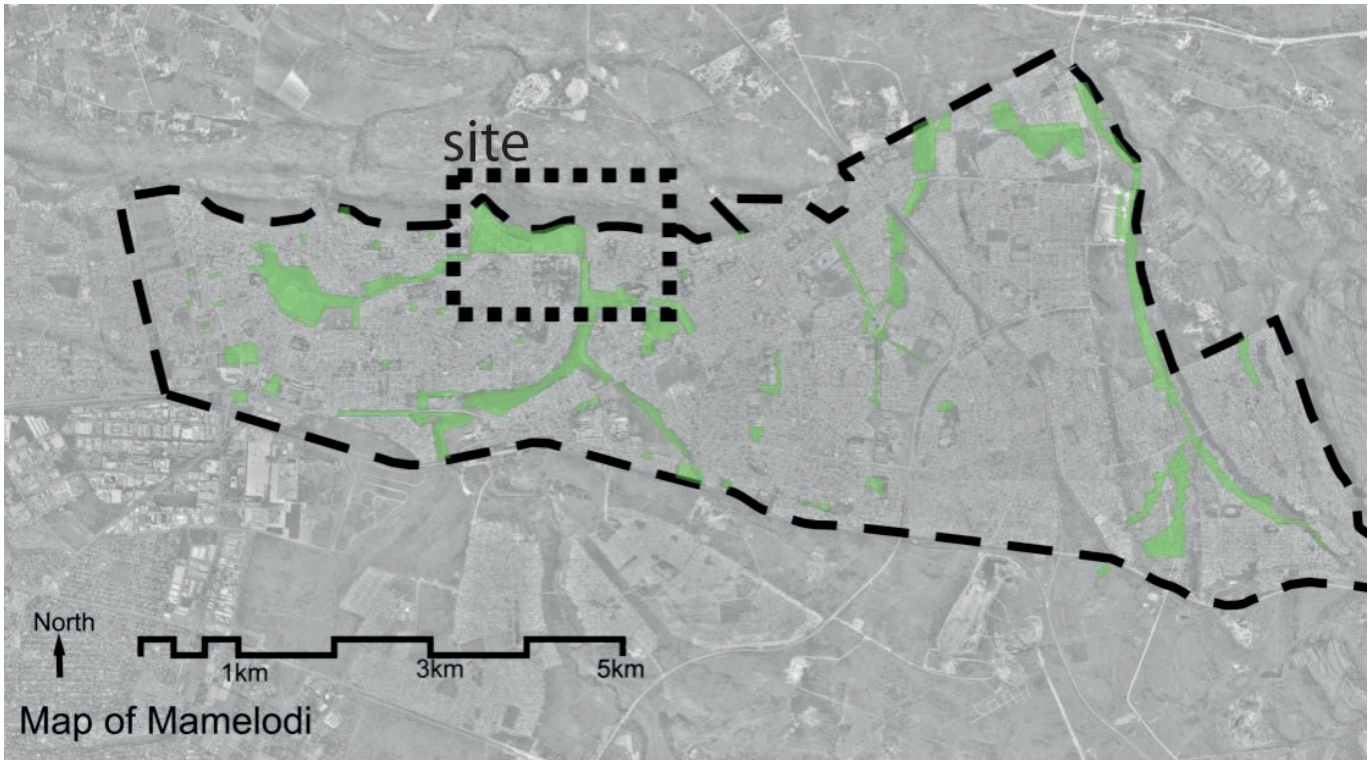
To highlight the challenges and opportunities for the project to be successful:

- integrate the biophysical and cultural attributes of the site in planning and design;
- connect the site to other community activity nodes within Mamelodi;
- link the site to the greater green open space system.

4.1.2. Location

The site is located at the foot of the Magaliesberg Mountains at the northern corner of the Pienaar's River bordering and separating Mamelodi West from Central.

Figure 20: Location plan of site in Mamelodi showing green open spaces (Author, 2011)



4.2. BIOPHYSICAL

4.2.1. Climate

Mamelodi is generally characterized by rainy and hot summers in November, December and January as well as dry and cold winters from May to July. According to Holm (1996: 69), summer winds are predominantly east-north-easterly to east-south-easterly while in winter they blow from south-west with a fair amount coming from north-east.

The design should encourage outdoor living in the favourable conditions of summer months. Trees should be utilised to protect people from the sun and winds.

Jan	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
Maximum average monthly temperature (˚c)	28,6	28	27	24,1	21,9	19,1	19,6	22,2	25,5	26,6	27,1	28	24,81
Minimum average monthly temperature (˚c)	17,4	17,2	16	12,2	7,8	4,5	4,5	7,6	11,7	14,2	15,7	16,8	12,13
Average monthly amplitude (K)	11,2	10,8	11	11,9	14,1	14,6	15,1	14,6	13,8	12,4	11,4	11,2	12,68
Average monthly relative humidity (%)	58,0	59,5	60,0	59,5	55,0	53,0	50,0	46,0	45,0	49,5	54,0	56,5	53,83
Average monthly rainfall (mm)	136	75	82	51	13	7	3	6	22	71	98	110	56,17
Rham 72	74	76	78	76	75	71	64	61	64	68	70	75	70,75
Rhpm 44	45	44	41	34	31	29	28	29	35	40	43	44	36,92

Figure 21: Climatic Data for Pretoria (Holm, 1996: 69)

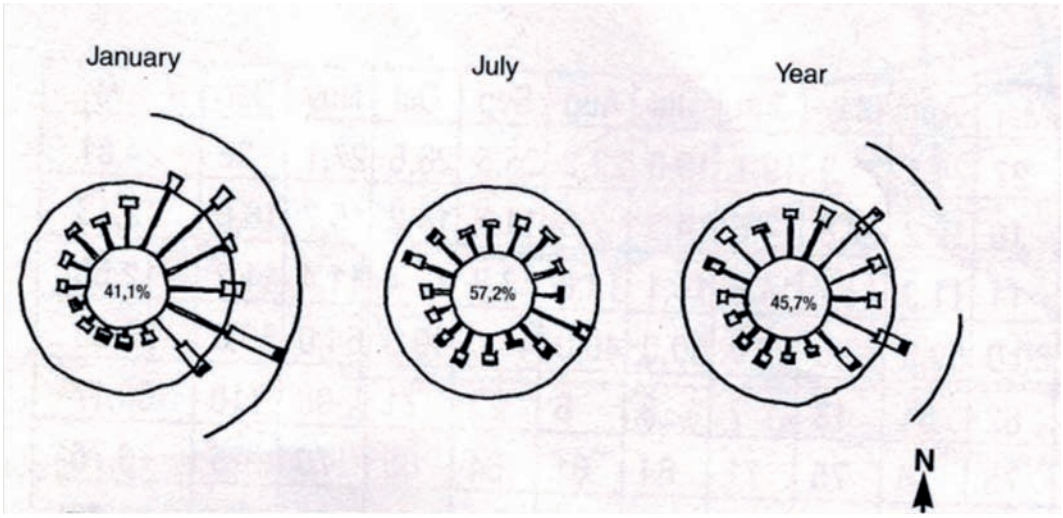


Figure 22: Wind Rose for Pretoria (Holm, 1996: 70)

4.2.2. Vegetation

The site falls within the larger Rocky Highveld Grassland. According to Low & Rebello (1996: 39), this is a transitional type between typical grassland of the high plateau and the bushveld of the lower plateau that includes the southern slopes of the Magaliesberg. The river has deep alluvial soils and an abundant supply of water, hence the trees grow larger than further up the slope.

Plant species found on the study area include:

Indigenous tree species:
- *Acacia tortilis,* (Figure 25)
- *Rhus lancea,* (Figure 30)
- *Celtis africana,*
- *Ziziphus mucronata* (Figure 29)

Exotic tree species:
- *Melia azendarach,* (Figure 24)
- *Pinus sp*
- *Platanus x acerifolia* (london plane)

The land is mainly covered with veld grass which can be grazed by livestock:
- *Cymbopogon plurinodis,*
- *Digitaria eriantha,*
- *Cynodon dactylon*
- *Hyparrhenia hirta*
- *Hyparrhenia tamba*
- *Eregrostis cuvula* (African EPA, 2007:7-8)

Alien grasses and forbs:
- *Pennisetum clandestinum (Kikuyu)*
- *Bidens pilosa*
- *Datura ferox* (African EPA, 2007:7-8)

There are also patches of reeds which attract wildlife including birds and insects. While reeds help in cleaning the heavily polluted river, the leaves are also used for weaving by the community providing economic opportunities which can be supported by new developments:
- *Phragmites australis* (Figure 23)

The largest portion of the project site is comprised of cut grass which could be rehabilitated by re-introducing indigenous planting to the currently open and exposed land. The project area is composed mainly of disturbed grassland. It needs to be rehabilitated by re-introducing indeginous grasses and trees.

Figure 23: Phragmites australis (Author, 2011)

Figure 24: Melia azendarach, (Author, 2011)

Figure 25: Acacia tortilis, (Author, 2011)

Figure 26: Disturbed grassland with alien vegetation (Author, 2011)

Figure 27: Exotic tree providing shade (Author, 2011)

Figure 28: Indigenous grasses and trees (Author, 2011)

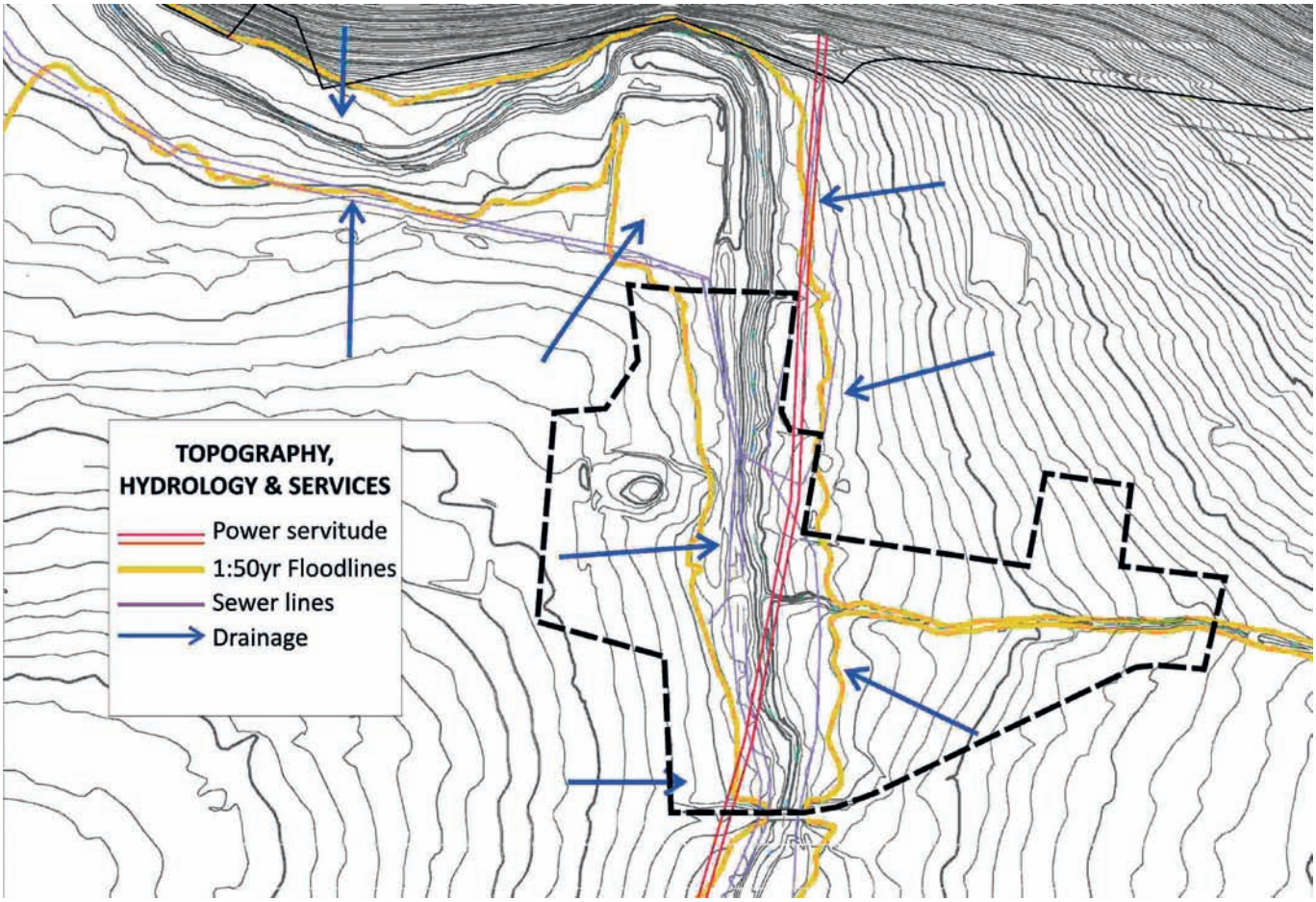
Figure 29: Ziziphus mucronata and Melia azendarach in the foreground (Author, 2011)

Figure 30: Rhus lancea, (Author, 2011)

4.2.3. Servitudes, Topography & Hydrology

The 1:50 yr floodlines (Figure 31) run along the edge of the residential development along the river. No structures are to be built within the floodlines. Servitudes, including sewer and electricity, run along the river further restricting development. Pienaar's River acts as the catchment for all stormwater in the township which sometimes results in flooding in summer. It also acts as land for servitudes such as sewerage and electricity. According to Bergstan SA (2011: 27), stormwater attenuation facilities will be required at strategic locations to detain stormwater run-off. This could provide opportunities for the cleaning of water through wetlands as well as recreational uses.

Figure 31: Topography, hydrology & services (Author, 2011)



4.3. CULTURAL

4.3.1. Landuse

The site is surrounded by low density residential land on the north and southwest, Tsomo Road on the southern to southeast edge as well as schools on the north western edge with the latter falling inside the floodlines hence forming part of the proposed site (Figure 32). This offers opportunities for engaging with the schools which can also positively contribute to the health of the river. By involving the community at large children will be taught, able to observe and get involved in issues affecting them and their environment at an early age.

Figure 32: Existing landuse (Author, 2011)

4.3.2. Access & Circulation

The site is accessed from several points from the residential area. Tsomo Road, used by taxis, has two bus stops providing major access points to site. Many pedestrians use Tsomo Road connecting the east and west to move around the neighbourhood. Due to the lack of formal pathways, footpaths are observed going across and along the site to places like churches, school, shops and recreational area.

The east and the west sections of the site are connected by bridges, these are:

- Vehicular bridge on Tsomo road;
- Informal pedestrian crossing using sewer pipe; And
- A Formal pedestrian bridge on the north

Unfortunately, these circulation patterns (Figure 33-34) can also be associated with large heaps of beer bottles and other litter found at access points. Recycling of litter when collected and sorted can provide opportunities for employment and skills development if used in art and crafts activities.

Figure 33: Circulation and other activities (Author, 2011)

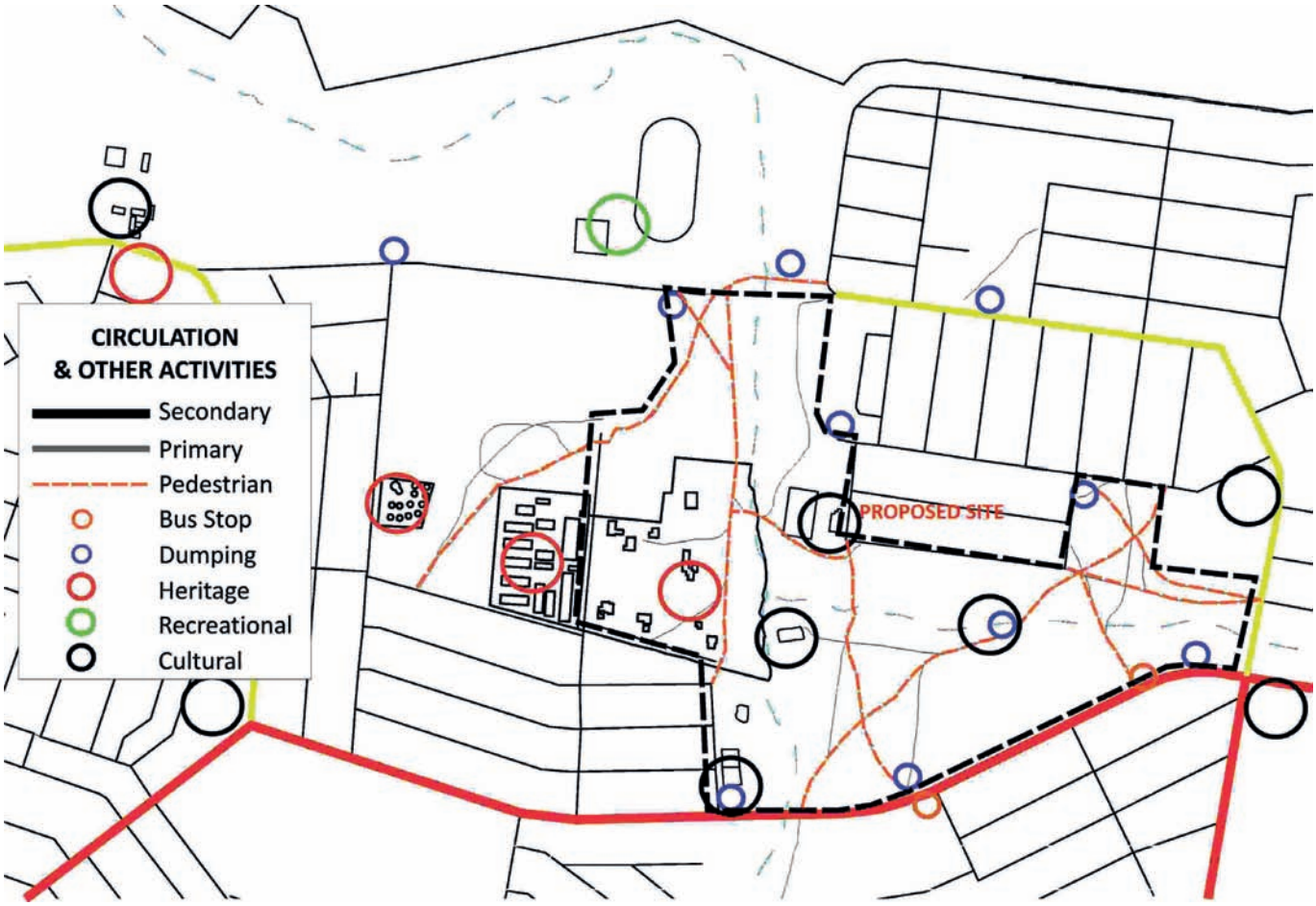


Figure 34: Relationship of circulation to open spaces (Author, 2011)

4.3.3. Historical

The following are places of historical importance in the study area (Figure 33):

Mthunzini Park and Beer Hall (No. 8a on Fig. 35)

The most active part of the project area, Mthunzini Park, boasts some of the largest pine trees (Figure 36) and one of the oldest Beer Halls in the township giving it a strong sense of place. The now dilapidated park with no structures is a popular place for play as well as picnic and braai activities. Residents visit the Beer hall and sit under this well shaded area to watch their kids playing soccer while they wash their cars and enjoy the music coming from the cars.

Old Rondavels (No. 15 on Fig. 35)

Constructed in the late 1940's, just after the residents of Mamelodi rejected similar buildings as part of a housing project, the few buildings served as a tertiary education facility (CoT, 2004: 7). Subsequently they housed some of South Africa's icons like Archbishop Desmond Tutu when they were later used as hostel accommodation. According to Mr Manyama (2011), the rondavels have been restored and developed into guesthouses to provide accommodation for people coming to the jazz festivals at Moretele Park. This also includes the development of the open space adjacent to the rondavels as a neighbourhood park (Figure 38).

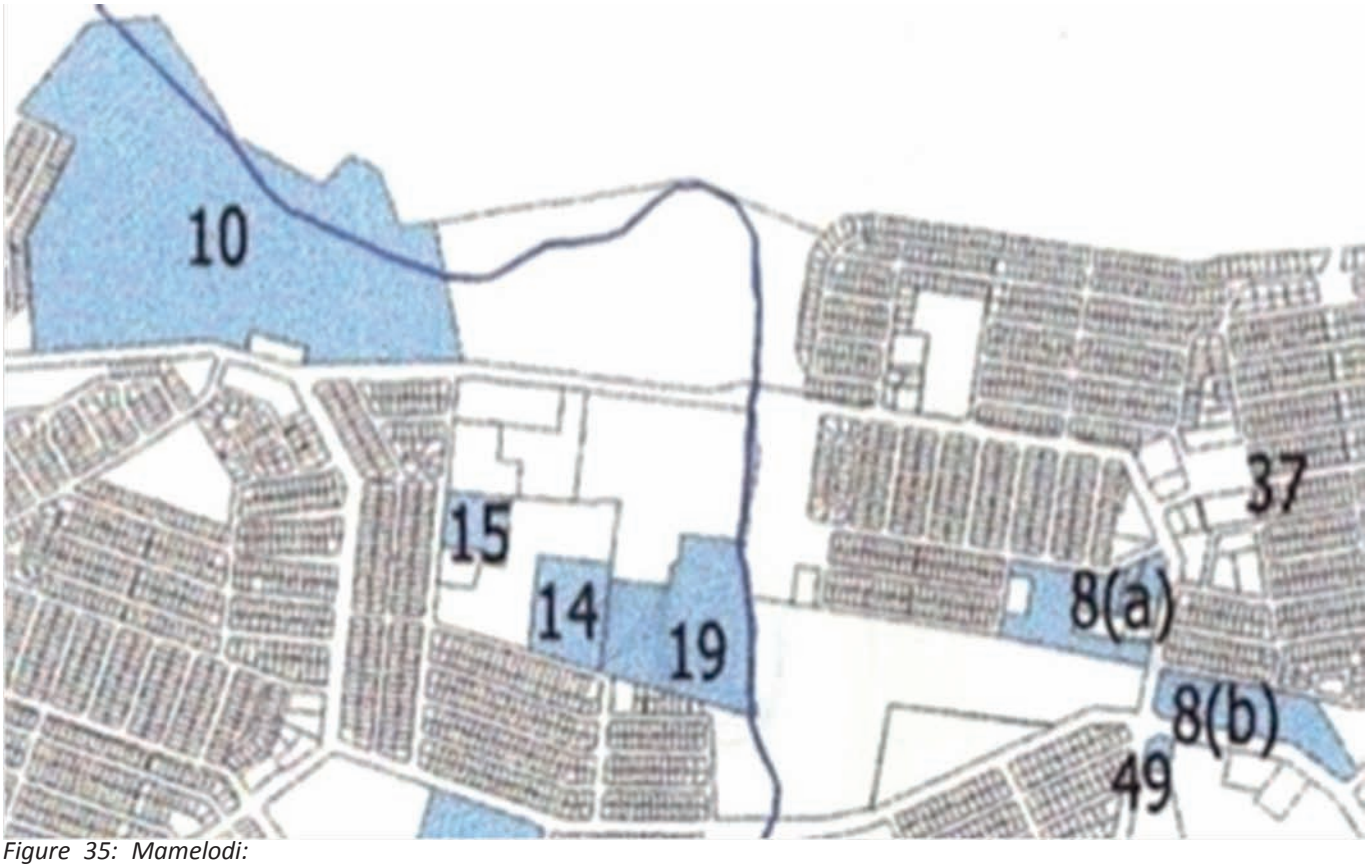


Figure 35: Mamelodi: Historical Sites (Cadre Plan, 2000)

Figure 36: Seating under pine trees at Mthunzini Park (Walker & Van Der Waal, 1991: 16)

Figure 37: Proposed design for Mamelodi Rondavel Park (CoT, 2010)

Figure 38: Rondavels in Mamelodi (Author, 2011)

Figure 39: Old guest house in Mamelodi (Author, 2011)

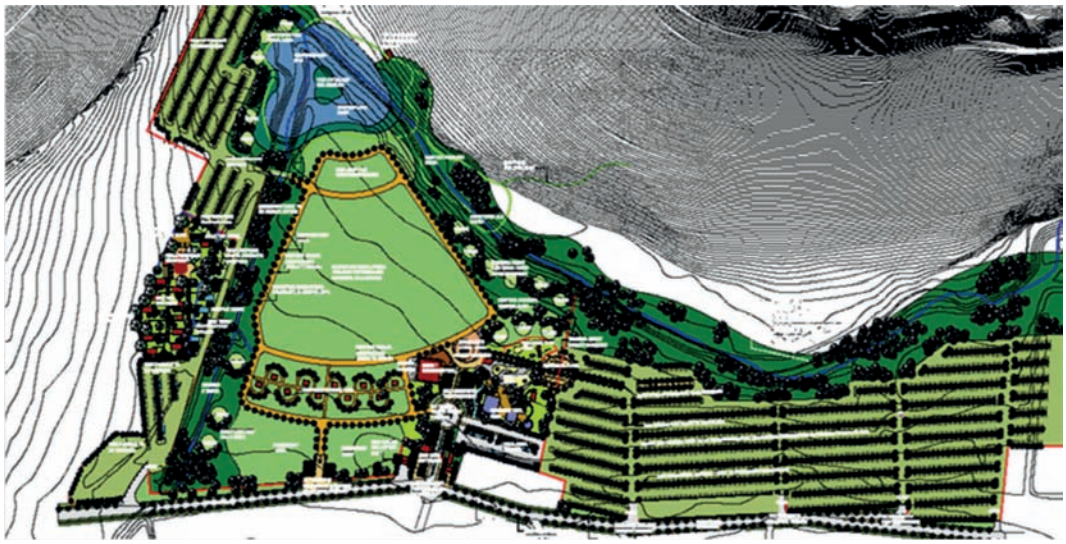


Figure 40: Proposed design for Moretele Resort Park (CoT, 2010)

Government Guest houses (No. 19 on Fig. 35)

Built in 1957 to house visiting black leaders, black people not permitted hotel accommodation in Pretoria (Walker & Van Der Waal, 1991: 41). Buildings are now informally occupied and are in a rundown state. They urgently need attention to preserve the historical significance of the area as well as protecting this greener piece of land from further informal settlement (Figure 39).

Moretele Jazz Park (No. 10 on Fig. 35)

This is a semi-public regional park well known for hosting the renowned jazz festivals, a genre that has been featuring some of the renowned artists like Vusi Mahlasela who proudly grew up in Mamelodi. "The resort currently caters for outdoor recreation in the form of braai, picnics, use of the community hall, and use of the swimming pools. The most significant and known use of the resort is the hosting of regional jazz festivals, which are currently held approximately four times a year (Insite, 2005: 6)." The park is also a popular spot for Christmas and New Year celebrations. There are currently plans to further develop the park (Figure 40) which according to Mr Manyama (2011) includes more chalets and a landscape design.

There is a need for the upliftment and redevelopment of these culturally and historically significant places as well as integration and linkage with each other and the green open space network for an enhanced sense of place and to better contribute to the wellbeing of the community in terms of making them safer, more attractive and equitable to use. This connectedness will also encourage interaction and connection of the community members.

4.3.4. Community needs

A community needs analysis was conducted on the following levels; consultation with community members including commuters and children using the river.

Community participation plays a significant role in meaningful community design and placemaking because the community members are the users of these public spaces and will in some way be affected by the issues in and around the site while they also add their own spirit, identity and character to the place. According to Ntate Maina, an informal resident of the old Vista University classes, Pienaar's River is a boundary separating the Sotho on the west from the Tsonga on the east. He also highlighted the hazards that the river presents to the community when flooded especially the helpless school children. He continued to point out that a lot of people get robbed, raped, killed and fights arise along the river. Ntate Maina again stressed the problem of flooding which makes the river impossible to cross while making the only bridge in this part of the township a spot targeted by criminals. He stated that the open space from the river going up to Mthunzini Park used to be a park but because of the afore-mentioned issues the space has been neglected leaving only community farming activities. He also mentioned how the space is normally used by people coming to the events at Moretele Park.

According to Ntate Maina, people who cannot afford to buy the ticket to get into the Park meet here, park their cars and setup braai stands and have their mini-parties which unfortunately usually results in fights and people being killed.

According to the community, the river is primarily being used for:
- Farming (arable and pastoral);
- Recreational at local parks as well as kids who play in the water;
- Dumping (litter);
- Source of water for washing, irrigation;
- Criminal activities; theft, rape and murder;

Above and beyond the polluted river water, the study identified the following negative issues identified by the community which include lack of:
- security;
- community facilities;
- pathways for pedestrian circulation;
- safe access to the river and water;
- housing;

The author submits that there is a need for the rehabilitation of the river including purification of water as well as a revamp of community facilities, promotion of farming and the provision of safe recreational spaces.

4.4. SYNTHESIS

From the analysis of the site in context, the following challenges and opportunities have been identified that are to inform the development of the framework for the study area:

4.4.1. Challenges

- Servitudes and floodlines - no development within the reserve and 1:50 year floodlines.
- Low densities housing with buildings turning their backs on the green open spaces.
- Lack of vegetation especially trees along the river as well as the whole of Mamelodi.
- Limited river accessibility and crossing.
- High levels of crime.
- Pollution and mismanagement of the river and open spaces.

4.4.2. Opportunities

- Concentration of community facilities around the site including shops, clinic, churches, play grounds schools and vacant buildings available for re-use as well as proximity to heritage and culturally significant places.

- Proposed densification of housing in Mamelodi/ Nellmapius Masterplan (GAPP, 2010) will lead to continued growing number of people and improvement of the township.
- Proposed Pienaar's River Rehabilitation Framework (African EPA, 2007) lays out the proposed interventions
- Large numbers of pedestrians moving along and across the site allow linkage & connection.

4.5. CONCLUSION

The synthesis of the baseline data informs community design that responds well to the context by proposing suitable solutions for problem areas while contributing to meaningful placemaking. Context sensitive planning should form the basis for conceptual design and inspire creativity in responding to the needs of the community as well as ecological planning. Ecologically sensitive areas like the Magaliesberg Ridge must be protected with limited access and minimal infrastructural development. Disturbed areas should be rehabilitated. Better use of the tract of land along servitudes to serve the community should be encouraged while at the same time ensuring safe and healthy environments for the people. All things considered, the proposed interventions should try to resolve the challenges at hand and ensure that the available opportunities are optimised while bringing about a sustainable landscape intervention for the community.

CHAPTER

5

FRAMEWORK

5.1. INTRODUCTION

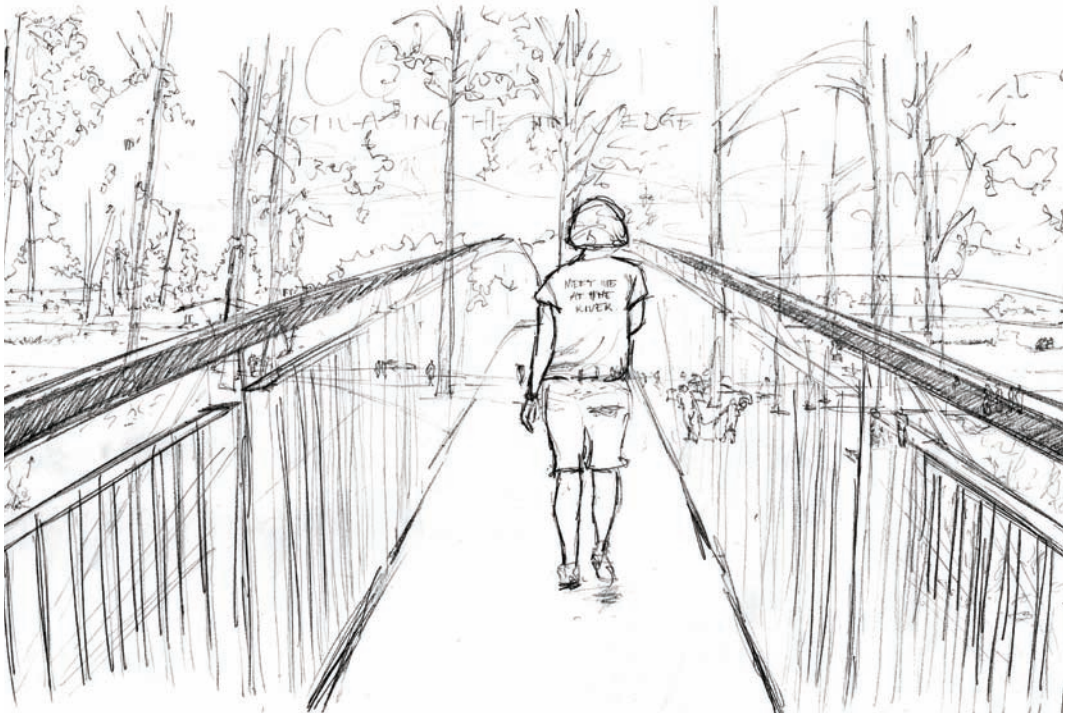
The framework for the study serves as a guide for the proposed development of the public spaces in and around the project site to respond the challenges and opportunities identified in the last chapter. This chapter will first look at Kevin Lynch's theory on the building blocks of urban design reinterpreted and applied to this study. It will then state the overriding vision and concept for the study area. It will then propose the objectives and planning guidelines to be implemented at the project site.

5.2. REGIONAL FRAMEWORK

5.2.1. Vision

The proposal envisages a continuous trail along the Pienaar's River for community use as a greenway system that can be a meaningful place connecting and activating the community from both sides of the river (Figure 41). Local cultural values and the environment are both under threat and this greenway can be seen as an active community arena highlighting their value and meaning to society.

Figure 41: Connecting people (Author, 2011)



5.2.2. Greenway System

Greenways can become places for a community's socio-cultural activities like weddings and churches as well as other rituals. Most importantly they can be places for gatherings of any sort bringing people together and instilling a spirit

of community. According to Flink & Searns (1993: xii), greenways can enrich our everyday lives by providing recreation and access to nature while serving to protect and enhance the remaining natural and cultural resources. The benefits can also ;

- help promote tourism by enhancing an area's unique natural and cultural attractions
- Provide pathways for people commuting (walk or bike) to and from work by proving an alternative to the automobile therefore
- Easing congestion
- Improving air quality
- serve as movement corridors for wildlife
- Provide buffer against harsh views
- Filter against pollution, sediment and runoff into rivers and streams (Flink & Searns (1993: xii)

These benefits will take advantage of the opportunities as well as deal with the challenges identified in the last chapter. The greenway system will be made up of different parks along river's open spaces (Figure 42)the as well as linkage to other open spaces nearby. These include the Tsamaya Park, Mthunzini Park, Rondavels Park, Moretele Jazz Park and Vlakfontein Park. The conceptual vision integrates existing parks, CoT's proposed parks and a Landscape Architecture Masters dissertation proposal done by Andrew Kerrin (2005) from the University of Pretoria to produce the Pienaar's River regional framework

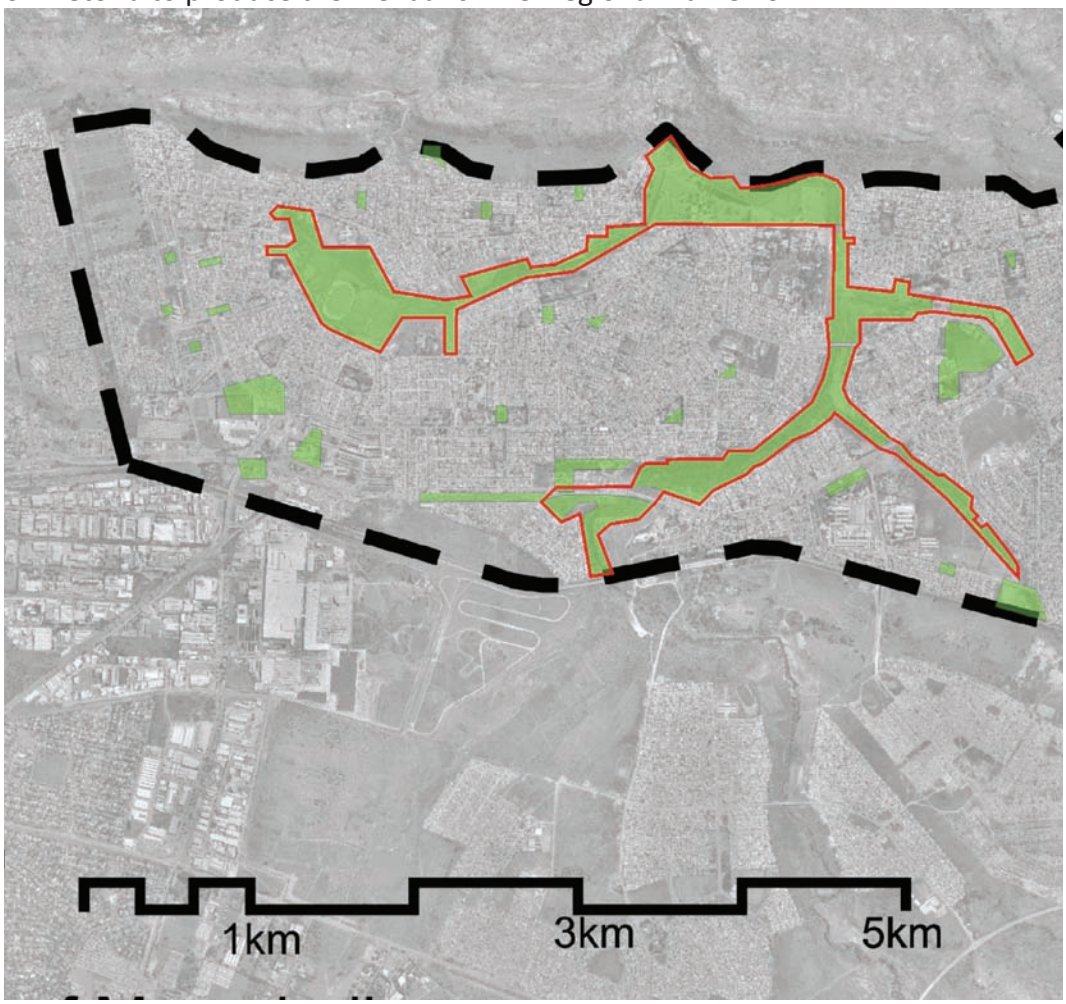


Figure 42: Regional Open Spaces (Author, 2011)

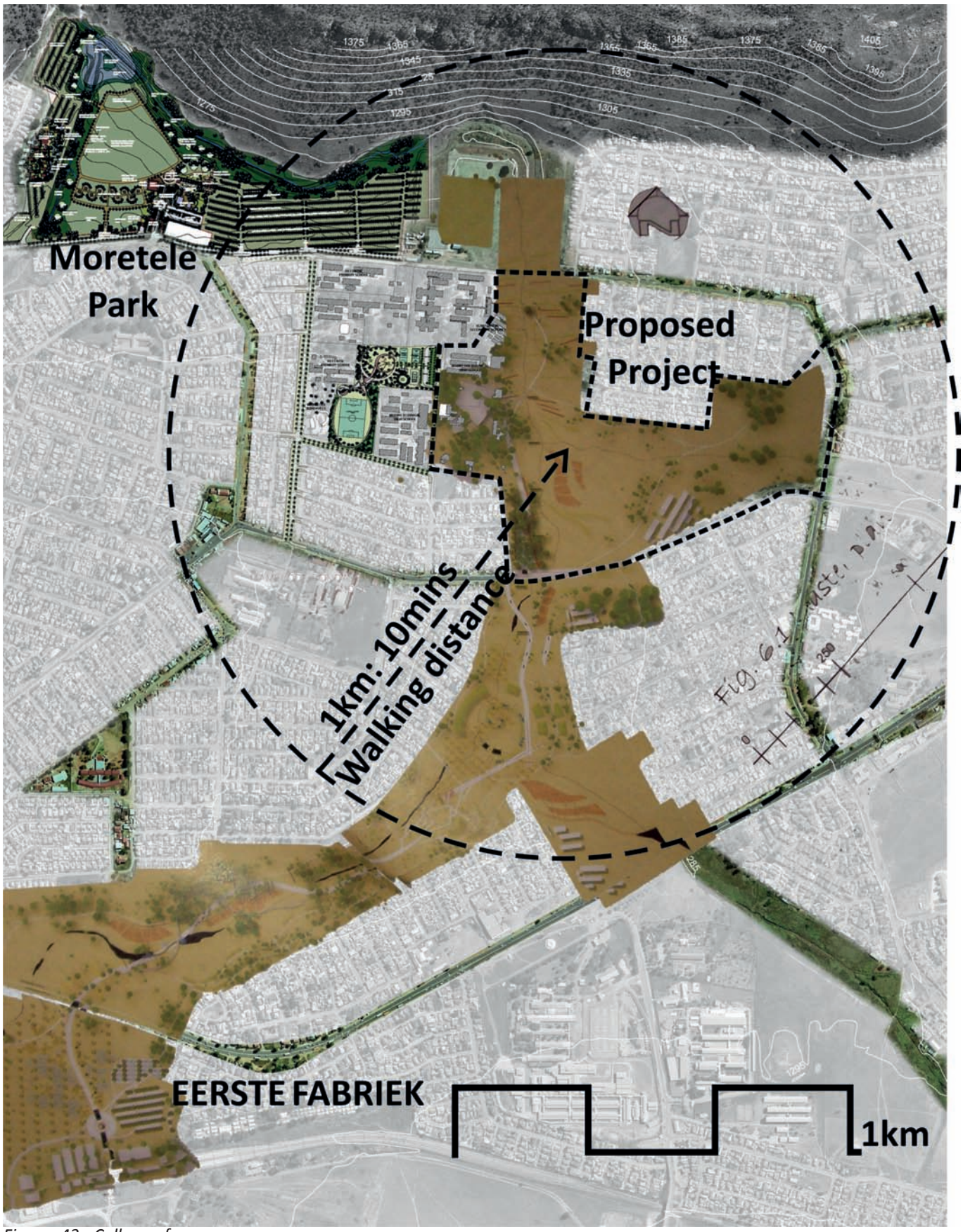


Figure 43: Collage of Regional framework (Author, 2011)

5.2.3. Catchment Management Plan

The catchment management plan looks at ecological solutions for the Pienaar's River catchment area to curb some of the water quality control issues occurring in the township. It also looks at the social aspects of the river system and proposes interventions which are aimed at improving the river's amenity and equitable use.

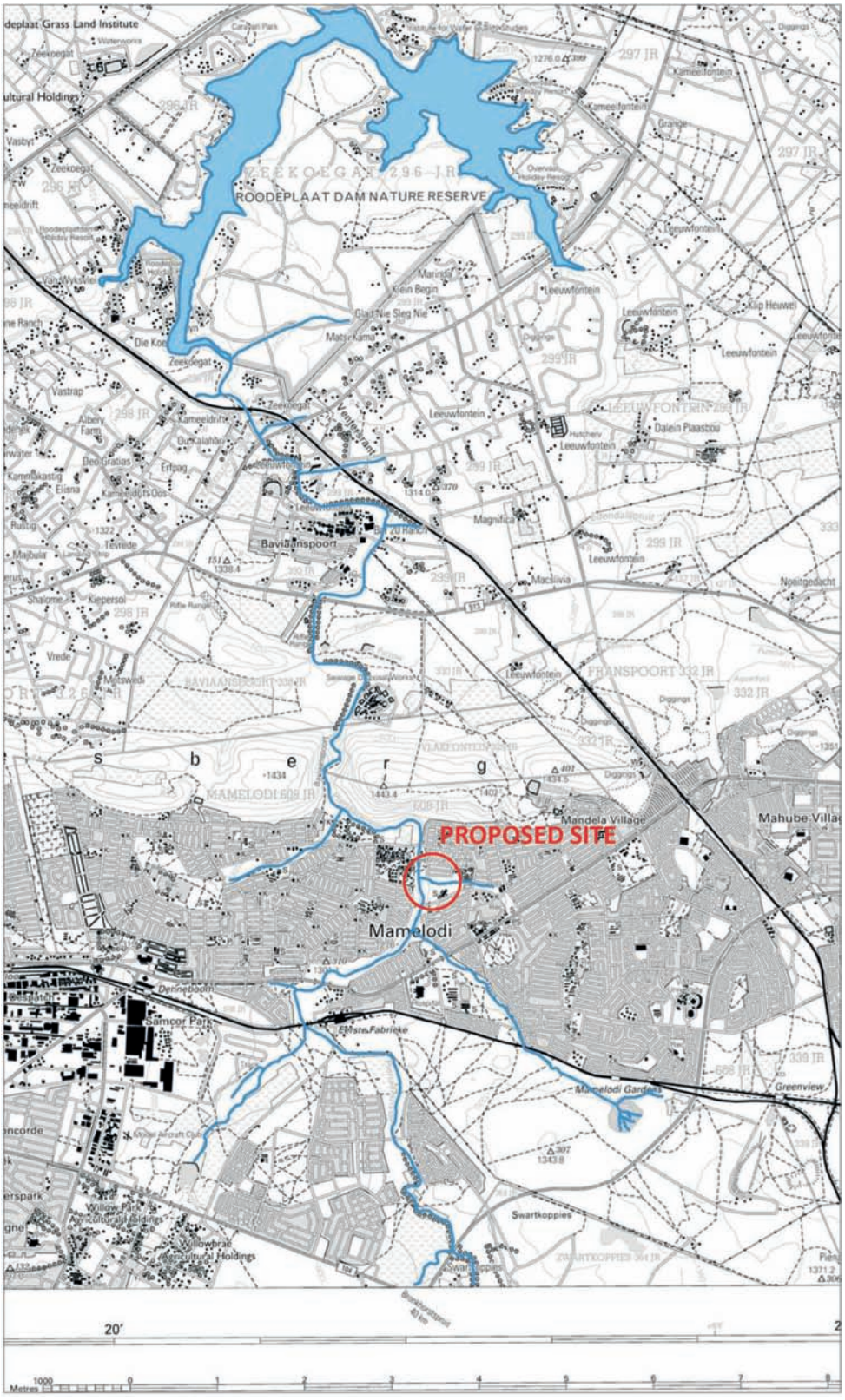


Figure 44: Pienaar's River Catchment Area (Topographical map modified by Author, 2011).

The landscape becomes a filtering zone for the water flowing from the township. This involves the introduction of wetlands and vegetation to manage excess floodwater, clean stormwater and nurture wildlife habitats. It will also promote plant and animal diversity as reintroduced indigenous planting matures and attracts wildlife. Rehabilitating Pienaar's River and improving water quality will provide educational and recreational opportunities, and give life to the township.

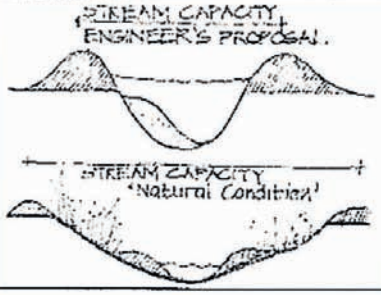
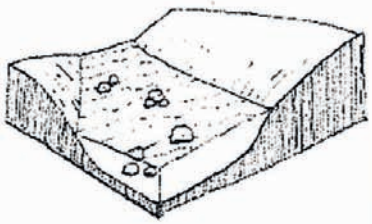
Existing Condition	Proposed Remedy		Benefits
Siltation 	• Clean out areas of where excessive siltation becomes a problem. • Clear channel where reeds have blocked the channel • Use soil to build berms adjacent to the stream.		• Moderate siltation allows vegetation growth and establishes habitat, and improve aesthetic appeal of stream. • Excessive siltation prevents flood conditions to pass.
Lack of life	• Implementing the suggested wetland restoration methods • Place large rocks in channel to aerate water		• Improved life in stream. • Improved life along stream due to increase in cover diversity • turbulent flow and cover • Aesthetically more attractive due to increase in habitat diversity.
Lack of bank vegetation	• Establish a mix of indigenous riparian vegetation. Choose the plant for its specific location. The tree list could include: *Combretum erythrophyllum* *Celtis africana* *Rauvolvia caffra* *Ficus ingens* *Ficus salicifolia* *Acacia galpinii* *Acacia robusta* *Ilex mitis* *Myrica serrata* *Rhus lancea,* *Rhus pyroides,* *Rhus leptodictya* *Ziziphus mucronata,* *Acacia tortilis*		• Provides shade that reduces water temperatures • Cause deposition of sediments and other contaminants • Reduce nutrient load of stream • Stabilize streambanks with vegetation • Reduce erosion caused by uncontrolled runoff • Provide riparian wildlife habitat • Protect fish habitat • Maintain aquatic food webs • Provide a visually appealing greenbelt • Provide recreational opportunities

Figure 45: Stream Rehabilitation Guidelines (African EPA, 2007: 27).

This study will also accept and apply some of the proposed remedies in African EPA's Pienaar's River Rehabilitation Guidelines (Figure 45). The stream rehabilitation guidelines also give the associated benefits of the remedies that this study intends to take advantage of. The propose Catchment Management Plan forms the regional framework for the study area with social and ecological interventions along the stream (Figure 46).

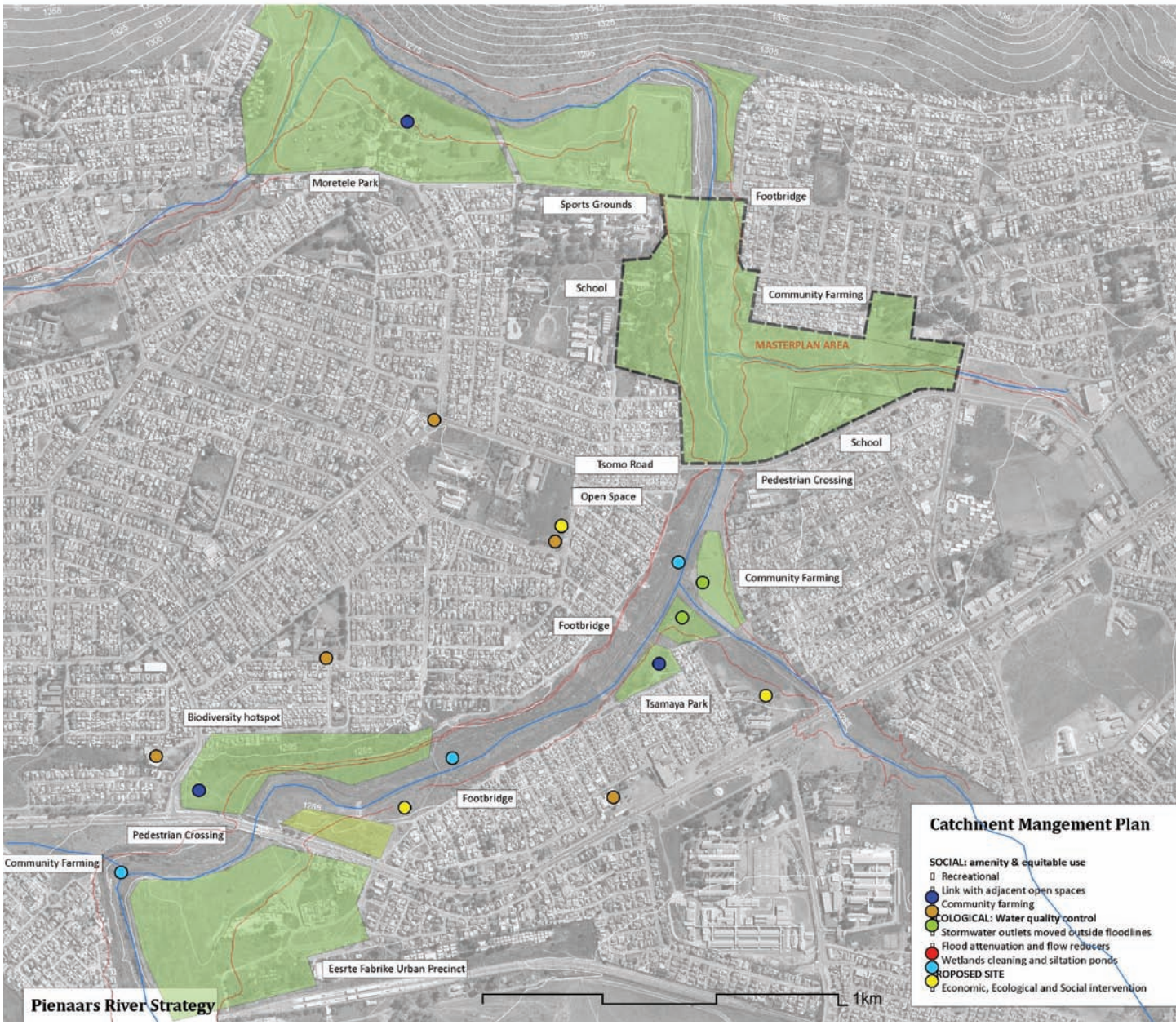


Figure 46: Catchment Management Plan (Author, 2011).

Figure 47: Proposed local framework (Author, 2011)

5.3. LOCAL FRAMEWORK

Moretele Jazz Park

An important cultural place for the community renowned for the jazz festivals attracting people from all over South Africa. Local artists get exposure here. It also provides accommodation in the form of chalets. The park needs to be open to the public for continued use throughout the year.

Rugby Grounds

The grounds need a facelift to attract more users. They also need to be integrated and/or linked with the surrounding environment and the proposed road and bridge will do just that.

Rondavels

An important heritage nodefor the community to be redeveloped and integrated with other pubic facilities in the area.

Neighbourhood Centre

This very active community node needs landscaping, upgrading of stalls, parking area and taxi rank

Sibanda road propose bridge

The bridge will link the community while it relieves pressure off Tsomo road bridge. It will also better link different community nodes e.g. Commercial, Rugby fields Moretele

Commercial node

The school needs to use open spaces better and also be linked with other schools creating an educational node.

Beer Hall & Mthunzini Park

This cultural and heritage structure and space are to be protected and developed to adding other activities that can encourage community

Tsomo road bridge

Pedestrian crossing will be widened to make crossing easier. Lighting is also proposed to make area safer at night.

School

The school needs to use open spaces better and also be linked with other schools creating an educational node.

LOCAL FRAMEWORK

The local framework (Figure 47) looks at the area surrounding the project site analysed in chapter 4 and briefly states and illustrates the aims and urban design elements that can be used to develop and enhance a sense of place and community.

5.3.1. Aims

Community activity nodes

This framework aims to create a sense of place in the community by linking the project to the surrounding context to ensure connectivity and interaction of community. It also aims to activate the neighbourhood centres (Figure 48) while preserving the rural character and image of the community in the process. The project proposes development of streets for pedestrians which could include pathways and seating under trees lining the streets creating green fingers that connect the neighbourhood to the river.

Cultural heritage

The project also aims to celebrate and protect the existing historically significant places and structures (Figure 49) to enrich a sense of place for this area of the township which include the first educational precinct in Mamelodi.

Ecological system

The local framework ties into the larger regional framework within the proposed guidelines to deal with the river system. It therefore aims at repairing the river's ecological integrity to improve water quality, deal with the issues of stormwater and vegetation cover (Figure 48).

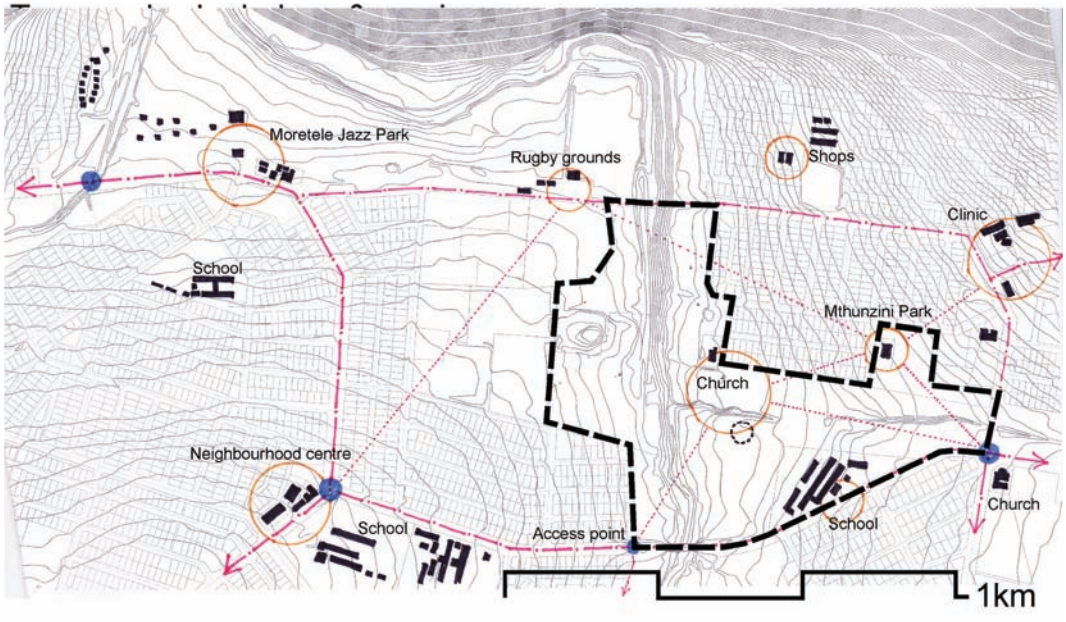


Figure 48: Diagram showing activity nodes (Author, 2011)

Figure 49: Culturally/ heritage places 1. Moretele Park, 2. Rondavels, 3. Mthunzini Park (Author, 2011)

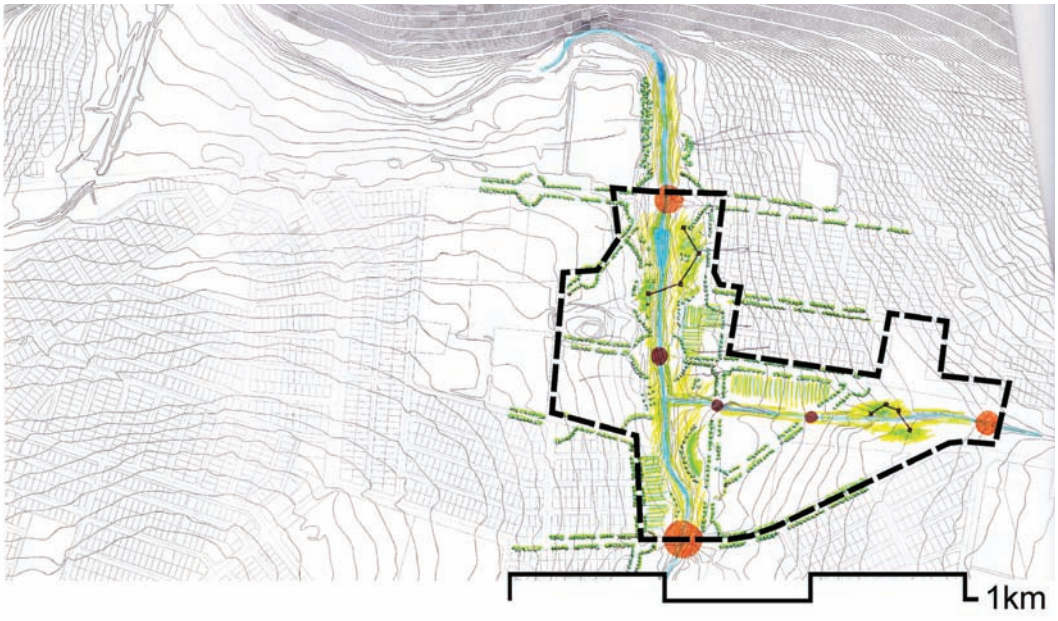


Figure 50: Diagramatic response to ecological system (Author, 2011)

5.3.2. Urban design elements

According to Hall and Porterfield (2001: 11), the building blocks of community design can be borrowed from Lynch's views on edges, paths, districts, nodes and landmarks, in his book *The Image of the City*, (Lynch, 1960). The author believes that at an urban design and framework scale these elements can contribute to planning successful communities and places. Given this, the author will use the following criteria to inform as well as justify decisions taken here and also leading the concept development of the project site.

Edges & Paths

Edges are linear elements that form boundaries between neighbouring communities and define the open spaces. The historical development of Mamelodi shows that Pienaar's River was used as the western boundary. This study has also shown that as the township grew beyond the river it continued to be a mental and physical boundary separating people living along this green strip of land. This study sees this 'river edge' as an opportunity to develop it from being a boundary to being a connector or a seam.

Paths are the lifelines along which the majority of activity take place and adjacent to which lie all functions a community depends on; government, industry, commerce and housing (Hall & Porterfield, 2001: 11). In an area like Mamelodi where there is lack of green open spaces, these paths become play areas for children and meeting places for older people sharing the events of the day.

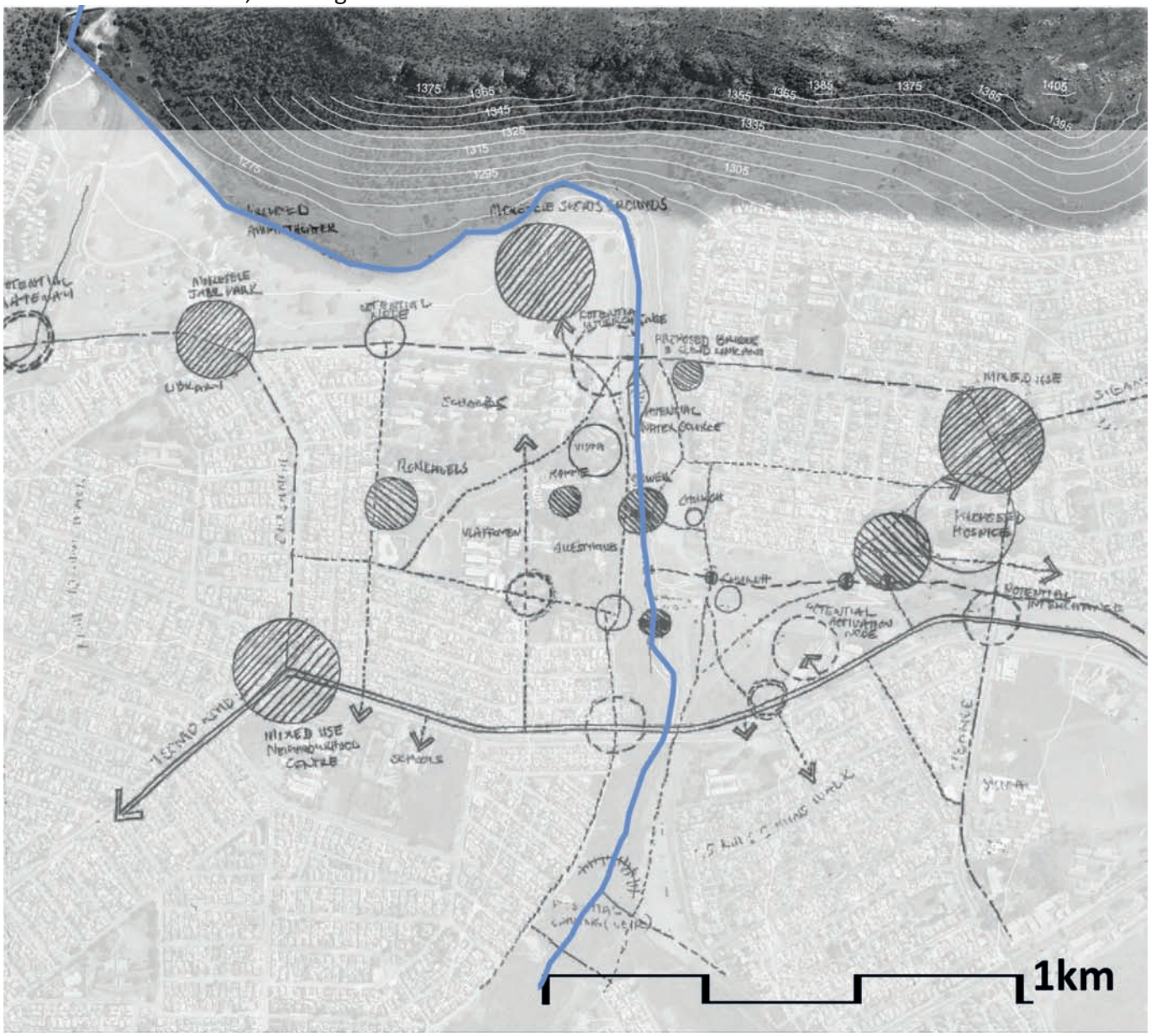
The study proposes a well defined pedestrian path lined with trees (Figure 51) that allow people to pause and contemplate, play or just take a breather. Provision of seating along this pathway will therefore be very important. A bicycle track is also proposed for recreational purposes. These paths will form part of a major pedestrian circulation system linking the HM Pitje Stadium Complex, Moretele Jazz Park and Eerste Fabrieke Station.

Figure 51: Pedestrian and bicyclist track (Author, 2011)

Districts & Nodes

Districts are large areas of the city that the user can mentally identify (Lynch, 1960: 66). In Mamelodi some areas are defined by tribal groupings and wards which are difficult to read spatially. They are well known by the locals as they form smaller communities within the lager township. In this area, Pienaar's River separate two smaller 'districts' of the Tswana in the west from the Tsonga in the east. This district has different qualities as one is more residential while the other has lot of community facilities and commercial activity respectively. Whereas the identity of each district needs to be improved, the connection between the two also needs attention as it will contribute to the formation of a larger safer and united community. According to Hall and Porterfield (2001: 11), nodes are points to and from which people travel, and very often they serve as the core or centre of a district. These places are usually easily recognisable by community since they are also usually close to major paths. They are usually mixed use areas or clearly defined places with unique use and character. In the study area, these nodes include Moretele Park, the neighbourhood centre and Mthunzini Park.

Figure 52: Edges, paths districts and nodes (Author, 2011)



Landmarks

Landmarks help in creating an identity and a sense of place as they can form visual and mental reference points used by the community. Magaliesberg Mountains stand majestic forming the northern boundary of Mamelodi. This natural landmark is visible from almost all over the township (Figure 48).

5.4. GUIDELINES

Based on the above framework, the vision and the aims generated, in the masterplan area, the following guidelines need to inform design:

- The river should be seen as a place for community connection, linkage and nature experience rather than as a boundary.
- Urban edge; housing densification, facing the river, creating an activity corridor linking hard and soft spaces;
- Residential with business rights (mixed-use).
- Generating a significant mass of people to support community life.
- Streets and walkways should encourage socialisation and insure safety to the users especially pedestrians.
- Planning should encourage access to community facilities and neighbourhood centres that have unique identity and enrich public environment e.g. community centres and shared public facilities; educational, recreational, spiritual, commercial, health facilities.
- The community should be educated on the cultural and ecological values of the river.

5.5. CONCLUSION

The framework improves the circulation system which ensures access and connection to places and other people in the community. Whereas the river is the main study area, the open green spaces linked to it improve the river's connection to other activity nodes. The greenway system would help in reducing problems of crime, flooding and pollution while providing community amenities with possible economic value. The activation of nodes and access points to the site as well as clearly defined walkways will ensure visual and physical links to the community and the river system resulting. The landscape acts as both a recreational and movement spine with multitudes of activities that enrich community life. The design of the individual spaces including the project area, would enhance the image of the river in the community and germinate a sense of meaning associated with cultural activities, which consequently bring about a sense of belonging to place and community.

CHAPTER

6

PRECEDENTS & CASE STUDY

6.1. INTRODUCTION

The precedent study plays an important part in understanding how other designers respond to similar challenges and opportunities identified in the site analysis and framework and will inform the subsequent conceptual development of the project site. The study also tries to ensure that my design response does not repeat similar mistakes, if any, in the projects identified. The author visited the Soweto parks which are also along a river system and went on to do a detailed case study of one of them. The precedents investigated for this study are the Moroka, Thokoza and Dlamini Precinct, Dlamini Wetland Park, Harare Precinct 3 and the Shenyang Architectural University Campus.

6.2. MOROKA & THOKOZA PRECINCT

Project Location: Soweto, Johannesburg
Project Designer: Newtown Landscape Architects (NLA), Johannesburg
Year of Completion: 2005
Owner/ Client: Johannesburg Parks Department

6.2.1. Project Statement

The Moroka and Thokoza Precinct (Figure 56) demonstrate how the river system can be rehabilitated while becoming a recreational area for the public. Soweto lacks recreational spaces, which leaves the areas surrounding the river system as the last resort for public green open spaces.

6.2.2. The scope and challenges

Just like in Mamelodi, the river was facing social and ecological problems such as water pollution, siltation, overgrown reeds and public disregard. Apart from the floodlines, the river reserve is also used as a servitude channel which prohibits built structures. The design(s) had to deal with these challenges.

6.2.3. The concept

The concept for the parks seeks to integrate ecological and social realities of the site which would result in the appreciation of the open space by the community and an enhanced environmental quality especially the water in the river. These parks allow people to interact with each other while appreciating nature(Figure 54).

6.2.4. The major features

Whilst the two parks have shown great response to community needs in the process proposing a few activities and spaces provided include braai and picnic areas, open activity areas and play areas, it is commended for its success in:

Community involvement

The community was involved in all phases of the project from consultation in the planning process to design of art in the park. Public involvement is achieved in the design of artwork and the use of local labour for the upliftment of the community.

Water management made visible

Water is treated (Figure 53) through wetlands, siltation ponds and a dam. Flood attenuation has also been achieved by creating wetlands and silt traps upstream of dam.

Figure 53: Treated water at Moroka (Author, 2011)

Figure 54: Wedding pictures at Thokoza (Author, 2011)

Figure 55: Park seating at Dlamini (Author, 2011)

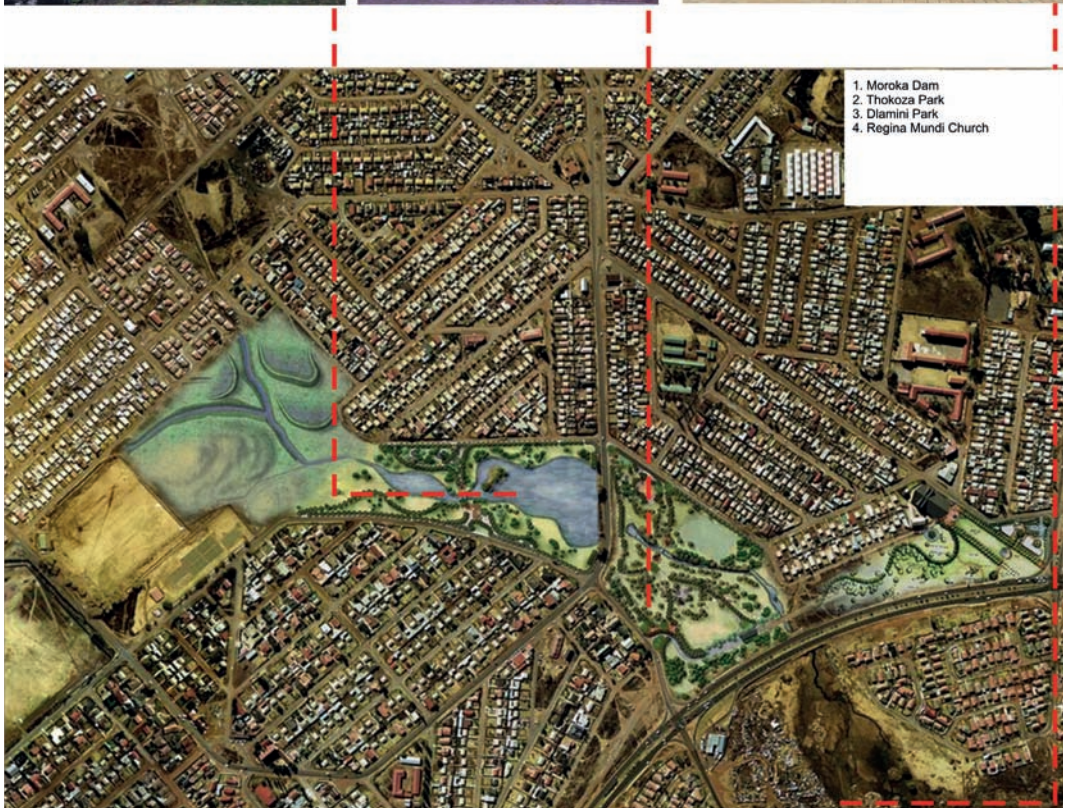


Figure 56: Park precinct materplan (Young, 2008)

This precinct demonstrates an approach to design that responds to both social and ecological aspects in rehabilitating a polluted river system for community use as well as consulting with the users in the design process. The author will approach the design of this study area in the same manner.

6.3. DLAMINI WETLAND PARK (detailed case study)

Soweto has fewer green open spaces with only the river, which runs through the township, allowing people to interact while enjoying nature. The Dlamini wetland regional park (Figure 57) in Soweto which was designed by Newtown Landscape Architects (NLA) forms a link between the older Thokosa and Moroka Precinct and the Kliptown Precinct. It addresses the concept of river edge development and responds to the need for passive and active recreational facilities for the community.

This review investigates the role of the Landscape Architect in creating a place that integrates both ecological as well as social realities of the site in creating a park. The protection and enhancement of nature, including wetlands and rivers, cannot ignore the people who live around it. Designed landscapes should therefore integrate the science in natural processes as well as artistic aesthetics and values. From the name of the place we get the sense that the project should address these two norms. As a park, Dlamini responds well to the community needs of recreational spaces. It creates a river edge which is almost the extension of the front yard of the plots facing the river. It therefore avails itself as a more public space in which everyone can come out play and interact with the rest of the community. The ablution facilities, play equipment as well as water features are fenced individually with gates that can be locked by the maintenance contractors which makes the park fully accessible from north edge yet safe for the kids in play areas.

According to NLA (2010), complicating factors to be taken into account were the flood line on the northern side of the park and the additional Rand Water servitude on the southern edge of the park. Although the designers have managed to stay away from the servitude with only pathways going across while by avoiding the flood lines they have missed the opportunity to design a didactic wetland landscape. The park does not demonstrate ecological processes as one would expect. The stormwater outlets (culverts) display minimal attempt to avoid soil erosion and deposition of debris from the neighbourhood. There is no visible water or treatment in the wetland where reeds cover the whole system. The artificial water feature does not seem to be attracting kids. The park was originally open but later on fenced so that children can not use it during school hours as they stayed away from school (NLA, 2010). The palisade fence is too close to the play equipment which include swings and this is a safety hazard. The choice of materials is limited to mild steel, concrete, and drought tolerant planting. Tree species include popular river bank specie *rhus lancea* which bears edible sour fruits. Groundcovers include the colourful *dentis grandiflora* while the sculptural *aloe ferrae* has been used in the far west end. Park furniture includes bright coloured concrete seating and exposed aggregate bollards that also double up as seating. Where thinner bollards have been used they are already being knocked down by cars. The braai stands seem haphazardly placed with no shade and seating around them.

Figure 57: Dlamini park masterplan by NLA (Wiskins, 2011)

Figure 58: Desire lines (Author, 2011)

Figure 59: Play area fencing (Author, 2011)

Figure 60: Zero depth water feature (Author, 2011)

Figure 61: Park seating (Author, 2011)

The designer missed the opportunity to use the only two large trees on site to create a sense of place. One also wonders why the sculptured lighting is almost ten meters high and whether they are not going to be covered by tree canopies in the future. The circulation paths are limited to the southern side, furthermore the designer failed to anticipate the tendency of pedestrians to take short cuts which has resulted in a foot path developing and already signs of erosion showing. During a time when water is a scarce and expensive commodity, the whole park is covered with lawn that needs to be watered regularly. The author feels that a more sustainable veld grass could have been used and the money spent on irrigation used somewhere else like on a shade structure that could accommodate weddings and family parties.

The park as a whole has been successful in addressing this river edge landscape and bringing people out and close to nature but has failed in taking this further by integrating natural processes with social activities like at Thokoza and Moroka parks where people are allowed to come in contact with water at river crossings and at the Moroka dam which is a popular spot for wedding pictures. The park has been welcome by the community evident as schools use the formal soccer field for practices and the play areas are popular kids meeting places.

6.4. HARARE PRECINCT 3

Project Location: Khayelitsha, Cape Town
Project Landscape architects: KALA Landscape Architects, Cape Town
Year of Completion: 2009
Owner/ Client: City of Cape Town

6.4.1. Project Statement

Harare Precinct 3 (Figure 62) project expresses how improving public open spaces can be used to reduce the rate of urban violence and crime. Townships in South Africa are known for high rates of violence and this project targets the notorious Harare Precinct in Khayelitsha.

6.4.2. The scope and challenges

The project links small open spaces which were severely affected by crime to create a safer and well lit commuter parkway across the township. The site was characterised by a neglected, badly lit and polluted open land with buildings facing away from it.

6.4.3. The concept

The park is located along an open drainage way and provides a safe recreational, play and gathering space. Four ideas have been key in the making of VPUU's success (Cooke, 2011: 19):

- Process is as important as the product;
- The approach has been area wide;
- It has been integrated in spatial, social, economic and management terms;
- Measures have been put in place to sustain what has been set up. These includes markets and a community centre.

Figure 62: Harare Safe Node framework (Cooke, 2011: 19)

These concepts are very important in community design and creation of lively and meaningful places as the project works with the community to address an issue (safety) that affect the whole precinct and builds facilities (e.g. markets) to ensure continued sustainance of the project.

6.4.4. The major features

Harare Precinct 3 project demonstrate the use of:

Safety principles

According to Cooke (2011: 23), crime has been reduced by 20% and murder by 33% and this method of crime prevention is being applied to informal settlements in Cape Town. An active community centre (including trade at a tuck shop, also known as a spaza shop) and well lit (Figure 64) park help in ensuring constant surveillance.

Connection and linkage

The linear park system activates the area hosting community activities and linking popular recreational spots.

Multiple activities and multifunctional space

The design provides a stormwater detention system, while also being a social place (Figure 63). The caretaker's house also has meeting rooms, spaza shops and a clinic for the community. This project creates a safe, healthier and active environment that has become a stage for different community activities (Figures 65-66). It has also attracted tourist who now feel at ease to visit the area to help kids from this disadvantaged community.

Figure 63: Social responsibility (Klitzner, 2010)

Figure 64: Safety: lights on (Klitzner, 2010)

Figure 65: Market in Harare Square (Erasmus in Cooke, 2011: 19)

Figure 66: Social issues (Klitzner, 2010)

6.5. SHENYANG ARCHITECTURAL UNIVERSITY CAMPUS

Project Location: Shenyang City, China
Project Landscape architects: Turenscape
Year of Completion: 2004
Owner/ Client: Shenyang Architectural University

6.5.1. Project Statement

According to Turenscape (2011) this project demonstrates how an agricultural landscape can become part of the urbanized environment and how cultural identity can be created through an ordinary productive landscape. Due to the increased rate of urbanisation, the city is encroaching into arable land reducing food production and wiping an important part of the history of China.

6.5.2. The scope and challenges

The design presents a part of a campus landscape proposal (Figure 69) for a site that has a rich agricultural history as it lies on what used to be a rice field that brought the community together and was the pride of the people. The project had to be developed within stringent budgetary and time constraints challenging and limiting design.

6.5.3. The concept

The concept of this design seeks to use rice, native plants and crops to keep the landscape productive while also fulfilling its new role as an environment for learning (Turenscape, 2011). It addresses issues of food production as well sustainability practice and education. It provides an opportunity for the students to learn from this productive landscape as the design brings them closer to the rice paddies where they can take walks, sit to study or have their breaks.

6.5.4. The major features

The project features:
- The productive campus rice paddy (Figures 67-68);
- Other native crops;
- The productive aspect of the landscape draws both students and faculty into the dialogue of sustainable development and food production;
- Golden Rice became an university icon (Turenscape, 2011).

These elements combine to create a meaningful landscape intervention socially, ecologically and economically as it re-establishes an identity for the school,reduces the use of non-renewable energy used in importing food while also creating employment for the surrounding community.

Figure 67: Landscape use (Turenscape, 2010)

Figure 68: Productive landscape (Turenscape, 2010)

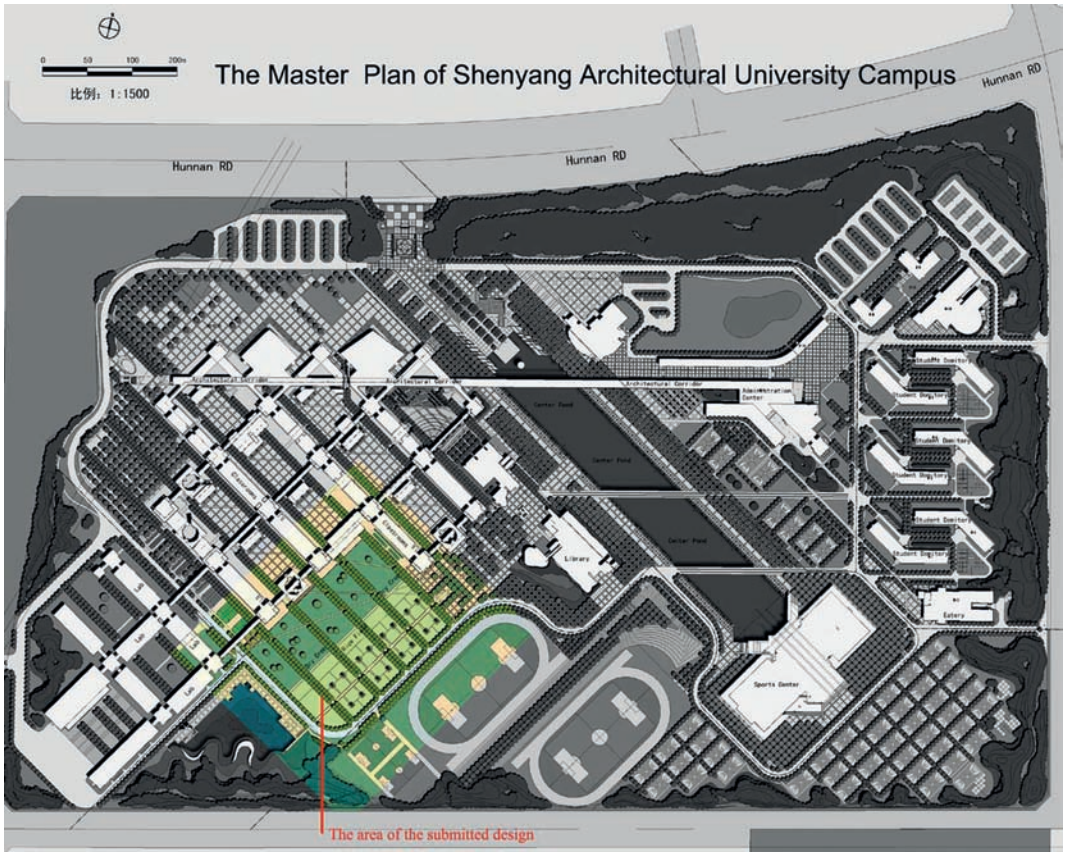


Figure 69: Landscape masterplan (Turenscape, 2010)

6.6. DESIGN PRINCIPLES

Design will focus on the following principles as compiled over the last chapters but also demonstrated in the above precedent study. Some of the principles overlap but all-in-all the author postulates that they could lead to a 'community meaningful-place':

6.6.1 Community design

- public involvement encouraged in all phases
- Create a invitational spaces and a sense of arrival
- Landscape elements to maintain a sense of history associated with place
- Spaces to re-establish the spirit of togetherness and *Ubuntu.*

6.6.2. Safety

- Improve surveillance and visibility so that the users can feel free to use the spaces without feeling vulnerable especially at night when lighting is needed.
- Public spaces to have security
- Spaces to be accessible and safe to use

6.6.3. Connection and linkage

- Create well sheltered seating spaces along the movement network
- Re-establish visual integrity of river edge
- Ensure clear linkage to cultural and historical elements/ places.

6.6.4. Integration of uses

- Multiple activities and multifunctional space
- Spaces to be able to activate the community
- orientation of spaces to respond to buildings frontage and the river edge

6.6.5. Robustness

- robust materials and construction details as well as the use indigenous water wise planting in stream rehabilitation
- design for deconstruction where possible
- design to last

6.6.6. Sustainability

- Integration of spatial, socio-cultural, economic and environmental design. This must be made known to the users.
- Water management - collect and reuse rain water and greywater
- Productive landscapes - promote agriculture as poverty alleviation solution

6.7. CONCLUSION

It is evident that the problem of shortage of green public open spaces in both our urban and rural settlements is forcing developers especially the government to look at the open spaces along rivers to provide for this. Unfortunately polluted water is a problem in these rivers making them a hazard to people's lives. The examples of works from Soweto demonstrate how ecological and social challenges can be tackled simultaneously in these river systems. The parks generally try to improve the ecological value of the river while creating recreational spaces for the locals. The Harare project demontrate how surveillance along movement corridors can improve safety and community linkage. Whereas there are not so many built projects on designed urban agricultural and community farming, the Shenyang Architectural University campus design demonstrates how agricultural landscapes can also be usable space integrating production and pleasure.

CHAPTER

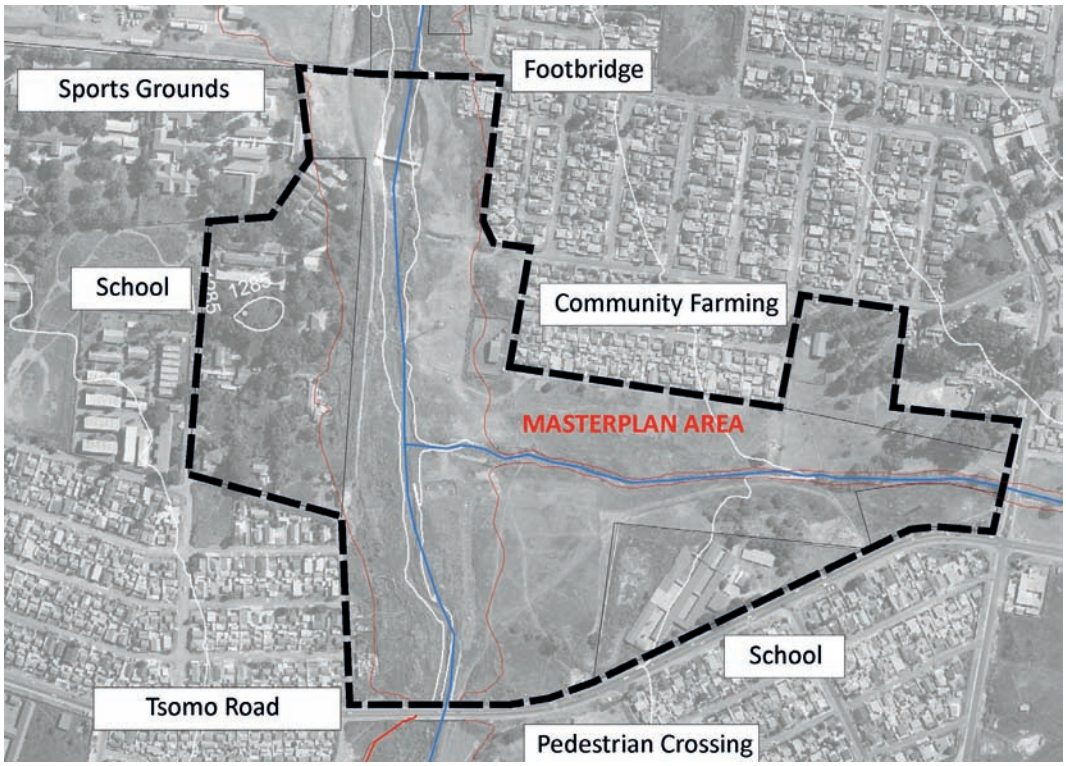
7

DESIGN DEVELOPMENT

7.1. INTRODUCTION

For the development of the masterplan, this chapter will be focusing on the area north of Tsomo Road which will encopass the focus project site (Figure 70). Based on the analysis and frameworks for the Pienaar's River, this chapter aims to employ the recommendations to reclaim the river in the Masterplan area that will also encompass the focus design project. The chapter first introduces and explores the concept development of a Masterplan for the site. The chapter then breaks down the master plan into elements and layers that explain how the different proposed systems fit into the existing natural and built environment. The chapter then concludes by summing up what was explored here and how the proposed Masterplan informs the selection of the Sketch plan area.

Figure 70: Masterplan area (Author, 2011)



7.2. CONCEPT

The concept is based on the notion of *community meaningful-places* where people are attracted and pulled to a shared meeting space to interact with each other and the environment thereby bringing the place to life. These places encourage activities that involve the community, where they can associate and freely connect with one another and the environment. According to Roe (in Benson & Roe, 2007: 80), where communities are helped to take decisions and power over the change in their environment, it may act as a catalyst to help create new connections within communities, release the energy and develop the potentials, which can alter economic as well as social conditions. The author submits that the proposals for this site should only involve the community at planning and design stage but also in the daily operation of the structures and spaces. The user should be allowed to change and re-appropriate these for themselves whenever necessary.

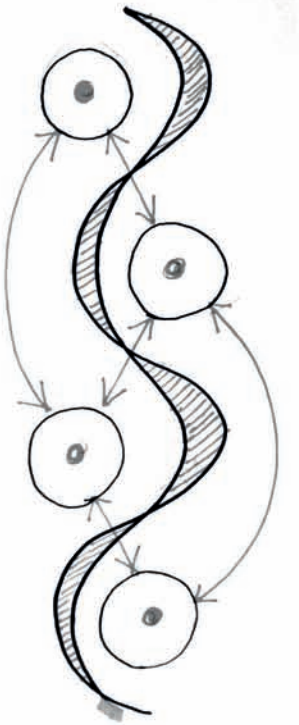


Figure 71: Parti diagram (Author, 2011)

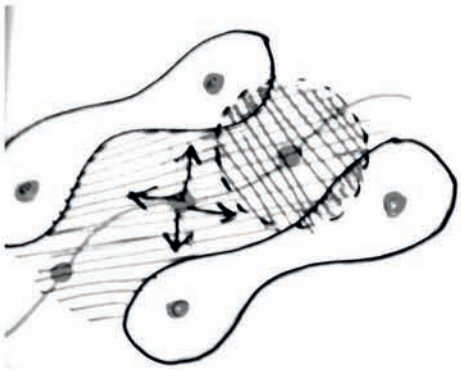


Figure 72: Parti diagram, open space linkage across the river (Author, 2011)

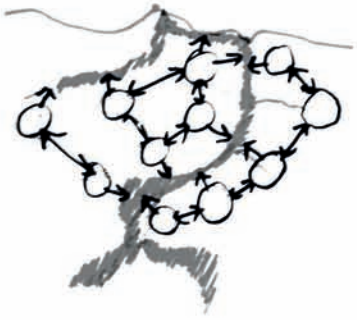


Figure 73: Parti diagram, open space network (Author, 2011)

7.2.1. *Parti*

The concept diagrams grow from the vision for Pienaar's River as a continuous spine that can activate the river edge. The spine (Figure 71) is made up of different components linked and supporting each other starting with the proposed pilot project and the existing projects along the greenway. The diagram (Figure 72) shows the pilot project as the heart that pumps life blood through the green system connecting to other smaller active nodes along the river and together acting as a sustainable system. The pilot project will be the first centre of energy pulling the residents to the river. The author envision that with the introduction of more projects linked by the river system and extending into the township, a new network (Figure 73) of community open spaces will develop.

7.2.2. Concept sketches

The initial concept drawings (below) presented different approaches dealing with the constraints and opportunities the site presents. They present different options that form part of the planning and design process:

A central meeting place

The first idea was based on the idea of a central gathering place (Figure 74) for the community surrounding the site that will act as the main attraction to the area. Learning from the Tswana's Kgotla spatial system, the central space becomes the most important area for meetings and interaction. The concept then connects to a nearby school which would form the *lekgotla* facing the community and housing the administration and maintenance for the park. The school becomes integrated with the open space linked by a strong axis (Figure 75) from the other side of the river and as a result becomes part of the larger community. The central meeting place needed to be revised as it did not respond well to the study area being the river system. It does not solve a lot of the problems of safety, bridging and neglect as highlighted in the site analysis process.

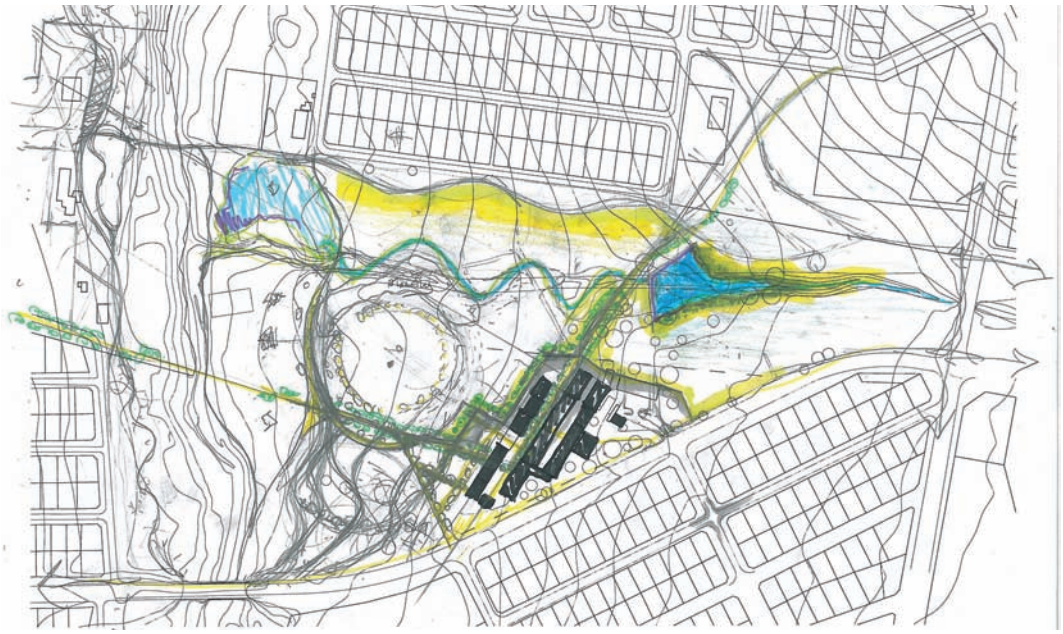


Figure 74: A central meeting place concept 1 (Author, 2011)

Figure 75: A central meeting place concept 2 (Author, 2011)

Back to the river

This plan (Figure 76) breaks down the first concept drawing into smaller areas that respond to the community activities happening on the edges while at the same time paying more attention to the river and the possibilities that can benefit the community by better integrating the water systems into the planning.

Whilst still using the school as a community facility, the large central meeting place is replaced by a large dam that gets water from the river upstream, stormwater and roof water from the school. One important community activity introduced here is the gardens that take advantage of the large unmanaged open spaces to be used as productive landscapes. The school would become the buyer for any excess from the gardens while it also becomes a teaching facility on urban agriculture.

This plan was criticised mainly on the reasoning behind incorporating the school into the masterplan. It raised questions in terms of the functioning of the school and the envisioned interaction with the open space and community in the process unnecessarily taking the attention away from the main issue of the study which is the river edge revitalisation.

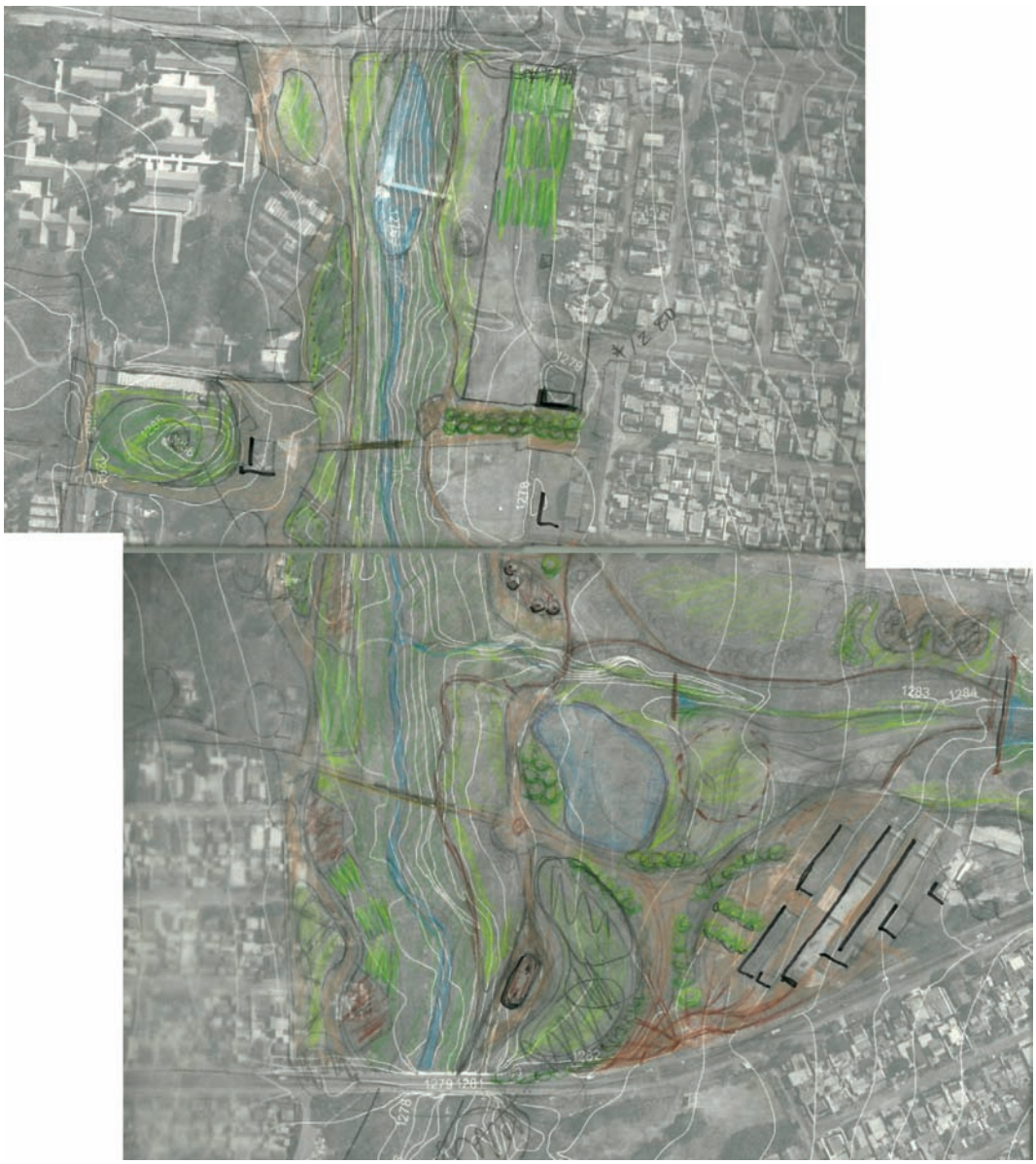


Figure 76: Back to the river (Author, 2011)

Green spine as an activity corridor

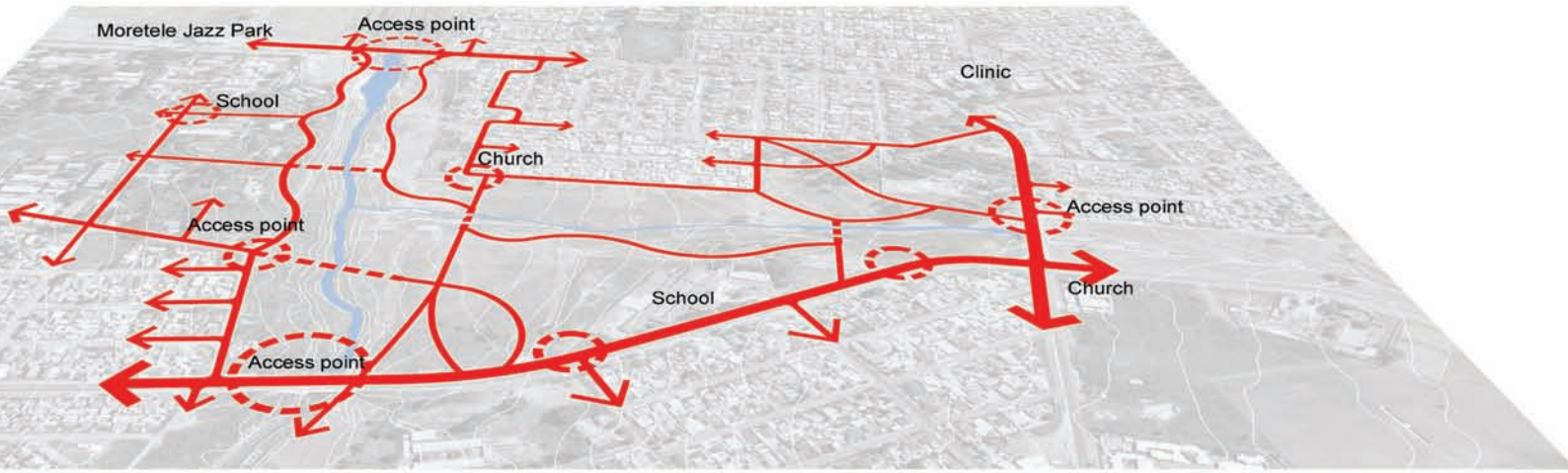
The final conceptual plan (Figure77) focuses on the river as the main problem in this study and looks at incorporating building that can be better motivated or defended. It also boldly expresses the scale that the urban farming can take and looks at how it would work with the existing circulation system. While keeping most of the ideas from the first two conceptual plans, it then explores the feasibility of reusing the building from an abandoned school as a community centre that will better respond to the river as well as some of the community issues like education, crafts and the farming. These activities will bring masses of people to the area. Surveillance towers are provided along the river to make it a safer place. The plan proposes a boulevard along the busy western side of the river that will link the people to the river. It also proposes parking areas to cater for the people coming to the markets at the gardens and the amphitheatre hosting entertainment activities for the community. The author submits that this plan responds better to the problem statement and main concept hence it is taken forward and developed in the final masterplan for the pilot project.

Figure 77: Green spine as an activity corridor (Author, 2011)


PROPOSED BRIDGE
ARRIVAL PLAZA
INFORMAL MARKET
GREYWATER TREATMENT WETLAND
SEWERAGE PIPE
AGRICULTURAL CENTRE
PICNIC
PIENAARS RIVER
URBAN AGRICULTURE
SCHOOL
COMMONS AREA
BRAAI FACILITIES
LOOKOUT PARK
COMMUNITY CENTRE
RESTAURANT
RETENTION POND
CHURCH
PEDESTRIAN BRIDGE
MARKET
WETLAND
URBAN AGRICULTURE
MANURE PRODUCTION
HUT
URBAN AGRICULTURE
RETENTION POND
MAMELODI WEST
RETENTION POND
PIENAARS RIVER
AMPHITHEATRE
PARKING
KIOSK
SPAZA
EXISTING BRIDGE

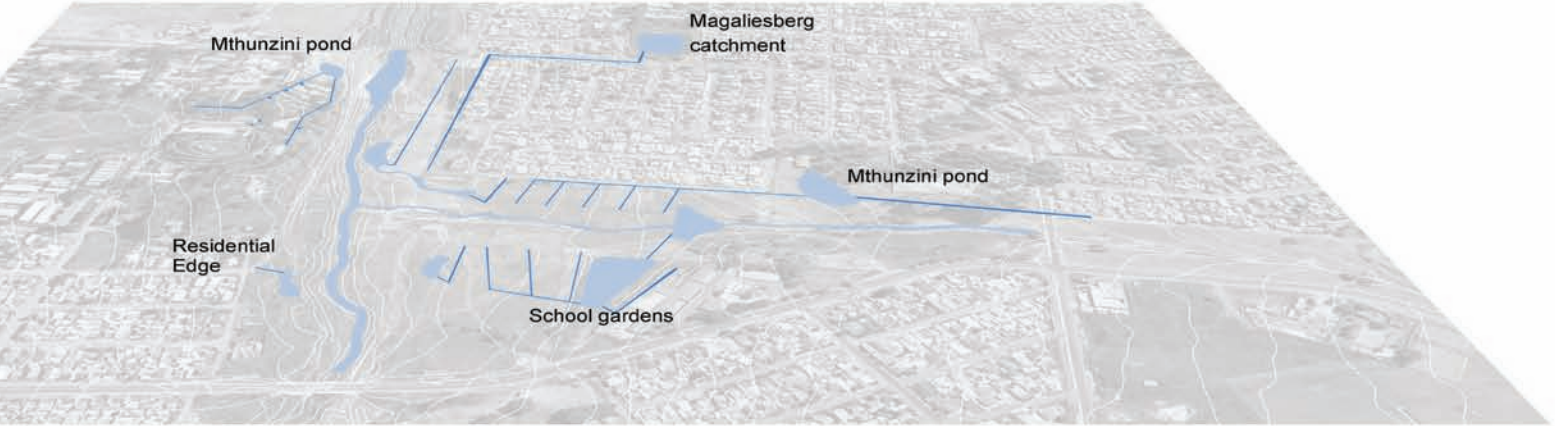
Figure 78: Pienaar's River Park Masterplan (Author, 2011)

Figure 79: Pienaar's River Park Systems (Author, 2011)


Moretele Jazz Park
Access point
School
Church
Clinic
Access point
Access point
School
Church
Access point


Agricultural &
Community centre
Urban
agriculture
Urban
agriculture
Beer hall
Waste transfer
station
Urban
agriculture
Stalls
Screen


COMMONS AREA
PICNIC AREA
RIVER TERRACES
KHALAMBAZO LOCAL PARK
LOOKOUT PARK
THE CHURCH
MNTHUNZINI LOCAL PARK
LESAKENG
KICKABAOUT LAWN
D6 LOCAL PARK
AMPHITHEATRE


Mthunzini pond
Magaliesberg
catchment
Mthunzini pond
Residential
Edge
School gardens

7.3. MASTERPLAN AND PARK SYSTEMS

The masterplan provides places for pleasurable and sometimes accidental meetings and gathering. It also celebrates the attachment that people generally have to rivers by providing places that allow them to act on activities they associate the river with especially in a community that has an agricultural background. These interactions between people lead to more time spent together connecting as a community in safe, well lit multi-functional green open spaces. It also proposes pedestrian pathways that ensure connectivity and linkage both within the park and to neighbouring activity centres. Abandoned and decaying buildings that are restored and reused as community activity nodes. In line with the analysis done, the author will pay attention to the following systems (Figure 79) and elements of the park:

7.3.1. Open Space System

The open spaces (Figure 81) will be developed as part of a regional linear park along the river system. The spaces are cleaned removing rubble, bottles and litter to make them healthy people spaces. Soft lawn and lighting is provided where necessary to make the spaces comfortable and accessible in the process encouraging circulation. The site has three main areas with concentrated vegetation: pines, biodiversity hotspot and old educational precinct west of the river. All existing native trees will be either retained or relocated on site for micro climatic control and space making. Water plants will also be used for water treatment and to capture silt in the wetlands system.

Culturally or historically important exotic trees will be kept for their value in creating a sense of place (e.g. pine trees at Mthunzini Park and Jakaranda trees at the educational precinct) while insignificant alien invasive vegetation will be removed. The biodiversity hotspot should be protected and used for educational purpose by the local schools. Proposed new planting is to be mainly indigenous (including in wetland and gardens) using species found on site listed in the site analysis or those native to Magaliesberg Mountains and the Pienaar's River system. The rehabilitation planting palette should also follow the Pienaar's River catchment rehabilitation guidelines.

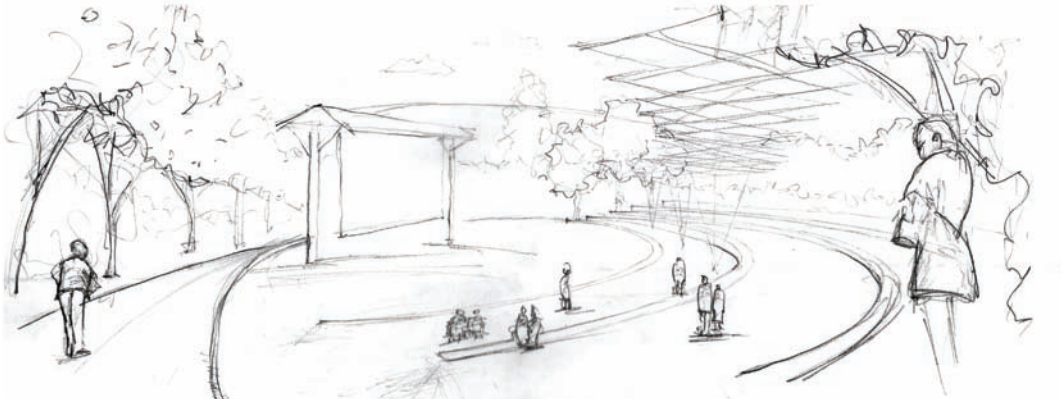


Figure 80: Conceptual amphitheater (Author, 2011)

Figure 81: Open Spaces (Author, 2011)

It is also advised that medicinal plants used by the users be included in the palette. Involving the community in plant selection and planting is very important to instil a sense of ownership. The amphitheatre (Figure 80) acts as the meeting place for entertainment and community activities. The amphitheatre will host outdoor concerts and motion picture for the locals. It will also double as kick about area.

7.3.2. Community nodes

The interactive programs provided educate and celebrate places that will bind the community together (Figure 83). These spaces and structures are adapted to people's needs to allow community activities that encourage meaningful interaction. The meeting and gatherings of people in these smaller parts of the large park and greenway system forms positive and functionally supportive spaces in the area (Figure 82). These elements contribute to the well being and

Figure 82: Sheltered seating (Author, 2011)

health of the people while strengthening their shared identity as a community. The shared values that the community attaches to these places will revitalise a sense of place in the area. The group activities performed here support a spirit of togetherness and active participation in community life. Because the design takes into consideration the historical and cultural significance of these spaces, they are given contextual meaning that makes them relevant and understandable by the users. These include:

Riverine edge - Needs to be developed in a way that will benefit the river ecology and the community. The river is rehabilitated to accommodate different activities and make it safe for play and crossing.

Mthunzini Park(s) - The space needs a face lift and introduction of structures. This popular spot is redeveloped to better accommodate the activities currently taking place here including picnicking and braai. Play structures are also provided for the kids.

Markets - The markets will serve the agricultural community as well as the artists selling and exposing them to the locals and visitors. Visitors will be exposed to the other parts of the park. They will also interact and hopefully engage with the other spaces and the agricultural production processes. The markets will also be room for local artists and craftsman to sell their items and demonstrate their skills.

Community facilities hosts among others a centre for information, after school learning and events to take advantage of abandoned school. The old buildings are reprogrammed to integrate with the community while still keeping the education aspect. It will host a nursery school, after classes as well as computer facilities and training for the community.

Figure 83: Community nodes (Author, 2011)

Church (es) - One of the local churches is using the open space as an outdoor church and needs to be catered for in design. New seating and planting responds to the current use and tries to provide for a more comfortable experience. The space stays robust allowing for other uses during the week.

Towers - This will function as surveillance, orientation, water storage and lighting towers for the community. A series of these multifunctional structures are planted along the river system.

Lookout point – The masterplan takes advantage of a small knoll in the school area overlooking the site from the west to visually connect users to the site while at the same time providing them with quieter spaces for contemplation.

Waste transfer station - Minimize waste, pollution and environmental damage by temporarily holding sorted household waste before being taken away to recycling centres and also recycling organic waste from the gardens as compost.

As in Tswana spatial planning, the spaces celebrate the idea of living outside. The open spaces allow for a myriad of community activities to take place at different times of day ensuring surveillance and continued safety of public spaces but most importantly sustainability of community life.

Culture and identity in Urban Agriculture

Farming becomes a vital part of the whole scheme and the aims for sustainable development of the river and community while reclaiming a sense of place for the township (Figures 84-87). In Mamelodi, urban agriculture along Pienaar's River can also revitalize and building strong communities and sense of stewardship. It can also ensure local supply of vegetables, save on energy and money used in importing crops and creating employment.

Other benefits of urban agriculture include:

- Sustainability awareness and education - hands on learning experience.
- Free time activities for kids – helping their parents after school.
- Community development projects - associated with farming spring up.
- Surveillance improves safety – there will be somebody in farms for most part of the day.
- Fighting poverty by targeting the unemployed and poor.
- Fostering local food production thus reducing income leakages.
- Promoting food security and resilient local food systems.
- Providing a means to reduce waste streams through composting.
- Promoting social organisation (social capital) via cooperatives
- Effective use of land that currently is treated as waste and Improving the visual aesthetics of unused land.
- Enhancing ecosystem services provided by open spaces (clean air, reduced wind velocities, temperature control, groundwater retention, stormwater attenuation) (Siyakhana Initiative, 2010: 9- 12).

These benefits when taken together present urban agriculture as a sustainable community building activity. As infrastructure in a city or town, continuous urban agriculture has the potential of being a thread that is woven through a community creating a rigid and ecological backbone for growth connecting neighbourhoods, open spaces, and urban markets (Grimm, 2009: 2). The author strongly agrees with both Siyakhana and Grimm on the potential value of urban agriculture especially in a poor community like Mamelodi. Apart from the sustainability strategies associated with urban agriculture, the author sees this as an opportunity to revitalise the area and bring the locals to the river in the process of reclaiming the neglected spaces.

Figure 84: Farming as a community activity (Read, 2011)

Figure 85: Urban farming by a school (Author, 2011)

Figure 86: Farming in residential area (Author, 2011)

Figure 87: Urban farming by a church (Author, 2011)

The author mapped out areas on the site of a slope below 3 percent to use for farming. This would allow planting without a need for terracing which would otherwise require more funds. The slope would also enable flood irrigation to be used but still have enough time for the water to infiltrate into the planting beds.

Another challenge was the 50 year flood line which covers almost all the land along Pienaar's River. The author believes that this strip of land is still suitable for planting as the floods are reported not to be frequent enough to cause much damage to vegetables.

This study does not intend to concentrate on urban agriculture as a theme or focus area but rather present it as an activity that can bring people together both those involved in farming and their customers. As already demonstrated by the outlined benefits, bringing urban agriculture into this project attempts to reclaim and revitalize the deserted and unsafe river system in a way that the community would more involved creating a meaningful environment to them.

7.3.3. Access and Circulation

The project provides connections between the west and east as well as smaller parts of the park and the greenway system as a whole.

The site is accessed from several main points including from the rugby grounds to the north, Tsomo Road crossing in the south and Mthunzini Park from the East. Figure 89 shows other pedestrian access points from the residential area and surrounding schools as well as circulation paths linking different activity nodes in and around the park. The main paved pedestrian and bicycle track runs all along the river system linking the south and north while providing opportunities for pausing and seating under the trees forming the boulevard. From this other paths branch out connecting to activity nodes along the river. Smaller naturally looking soilcrete paths take people closer to the water edge and through the riverine vegetation. Two bridges are proposed along Pienaar's River allowing pedestrian only crossing. The bridges should be integrated into the existing movement patterns and be outside the 1:50 floodlines.

Figure 88: Arrival plaza (Author, 2011)

Figure 89: Circulation system (Author, 2011)

Vehicular access is allowed to the gardens for services as well to take out the produce but otherwise circulation is limited to the park edges. Tsomo Road connects the east and west but needs to respond more to pedestrian safety. Another vehicular bridge proposed on Sibande Avenue will assist in safely connecting the neighbourhoods. The plan also assumes that the proposed bridge on the north will be built allowing access to site and ease of crossing.

Where vehicular access is needed in pedestrian focused areas, the vehicular movement is directed by the use of bollards while the paving material and levels stay the same so as not to obstruct pedestrian movement especially the disabled.

7.3.4. Water Systems

Water forms another important element in the master planning and detail design not only for use in irrigating the vegetables but also controlling water quality in the stream. The water system is informed by the larger Pienaar's River catchment management plan.

Water from the catchment area is channelled along bio-swales and furrows to retention ponds for flood irrigating the vegetables (Figure 90). More water is harvested from the roofs and stored in tanks while greywater is directed to the on-site wetlands system for cleaning before reuse.

Collection, Cleaning, Storage and Reuse

On-site greywater from the school and community facilities is taken through a series of wetlands for treatment and storage before reuse. Rainwater catchment systems are also proposed for recycling water harvested from the roofs.

Tanks are used for storing roof water as it is relatively clean. Off-site stormwater from the streets, parking areas, paving and the rest of the residential area is channelled through bio-swales to treatment wetlands and storage ponds (Figure 91). Treated water is solar pumped into storage tanks in the towers for re-use in vegetable irrigation. Where there is excess water in the ponds it can be discharged into Pienaar's River but only when it has gone through the cleaning process at designated areas with erosion control renomats and/or gabions.

Figure 90: Water system (Author, 2011)

Figure 91: Retention pond at Mthunzini Park (Author, 2011)

Water use areas:

1. Wetland treating Greywater from the old Vlakfontein School. Roof water collected for cleaning vegetables.
2. Wetland treating runoff water from catchment. Bio-swale along the edge of the residential area direct the water to a treatment wetland. The cleaned water is then used for irrigation and play.
3. Pond storing water from the road and roof water from school
4. Pond acts as both an aesthetic feature and storage for water use for irrigation of vegetable.
5. Wetland and ponds to capture water falling from northern catchment along Magaliesberg.

7.4. CONCLUSION

The chapter submits that the *parti* diagram and concept drawings demonstrate the basic building blocks of the masterplan as recommended from the site analysis and framework. The proposed master plan revitalises and re/activates the area with community building activities. The integration of the park's natural and social systems ensures the park's sustainability. An understanding of the site's constraints and opportunities ensured that the proposed interventions are targeted at issues at hand and respond in a sustainable manner as demonstrated in the proposal of a productive landscape. The project has also paid attention to tackling the issues that currently make Pienaar's River an undesirable place. Provision of public facilities like amphitheatres ensures continued use of site for long hours, making it safer.

Whereas the park is meant for the locals, visitors to the urban agriculture gardens and markets could come from the nearby Tshwane areas. Once they area in park, the visitors are exposed to other cultural activities and arts which including crafts like basket weaving. This master plan will result in a river system with heightened relevance and meaning to the local people. The author has chosen to work at the community centre in order to take most of the ideas presented in the master plan into detail design.

CHAPTER

8

DETAIL DESIGN

8.1. INTRODUCTION

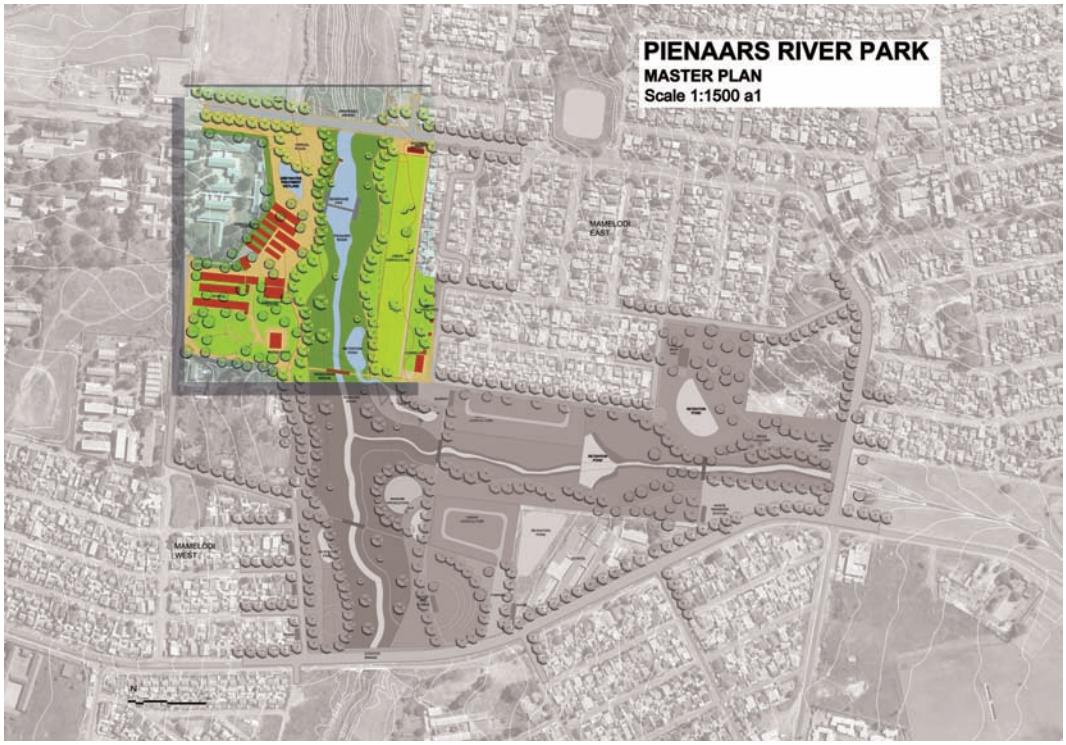


Figure 92: Sketch plan area (Author, 2011)

The author further looks at the northern portion of the park for the detailed design of the river edge and proposes community centre with agricultural facilities, school, hall and information centre (Figure 92) that will provide an opportunity to better demonstrate some of the ideas that can bring people from both sides of the river together in a shared public space and demonstrate role of landscape intervention in reclaiming the river edge.

This chapter first briefly looks at the challenges facing the design and the principles to be taken into consideration for sketch plan area. It will then present the generators for spatial organisation and form that influence the design. The chapter will then explore how the spaces, forms and meaning grow from the site into a series of analytical and design drawings that then evolves into the sketch plan. It then presents the designed areas in detailed drawing and short explanations of how the spaces work and how they fit into the larger park system. The chapter concludes by briefly stating how the design was able to overcome the challenges and learn from the design generators in creating meaningful community life places.

8.2. ANALYSIS

The focus project area features (Figure 93-99):

- large existing trees that include london planes and jakarandas on the west could be used to provide shade and modify micro-climate.
- a raised footpath resulting in a ditch between the river and the buildings can form part of the river system circulation network while bringing people to the river's edge.

- old school buildings informally occupied by members of the community provide an opportunity for re-use saving on resoources that could be used for new structures.
- second pipe crossing river used as a 'bridge' by the locals is a hazard especially during the floods as children drown.
- stormwater outlets inside the 1:50 year floodline causing soil erosion. Area needs to be rehabilitated and outlets moved outside the floodlines.
- a proposed new vehicular bridge on the northren end provides more opportunities for access and linkage.

8.3. DESIGN CHALLENGES

Complicating factors to be taken into account include the 50 year floodlines 400mm sewer lines and electrical servitude (east of river) along the river (Figure 93). The presence of floodline means that no structures are to be built within this area. The floods have also proved to be a hazard some of the buildings to be reprogrammed are within floodlines while the floods have been reported to come close to other buildings.

8.4. DESIGN GENERATORS

Two main generators provide typologies for the design: Tswana lapa system and the river. These are place specific 'precedents' as the Tswana system was used in planning Mamelodi and still exists at the rondavels hundred metres from the sketch plan area. The author believes these elements will give the design a character that celebrates and maintains the spirit of a place.

8.4.1. Tswana *lapa* system

As already mentioned (chapter two), the *lapa* system (Figure 100-103) used a dwarf wall to define spaces, their use and hierarchy in a traditional Tswana homestead. Openings along the walls connect the spaces to more public areas. These walls can be seen in the first images of Mamelodi. The author will use the dwarf wall typology and the application of a typical wall as a multifunctional architectural element that can develop into seating, retaining walls, terraces, landmarks and/ or signage.

8.4.2. River

The river's natural form follows the contours contrasting the more rigid and formal forms in the township. Its playfulness in form makes it an inviting element in the landscape. It widens creating areas where water can settle and becomes narrower forcing water to flow faster just like paths can do in a landscape. If these linear element can be seen in design as a space for things to happen, e.g. people to pause, then it becomes a meaningful connecting place. Water is also becomes an important element in the landscape not only in the river but also in its natural cleansing processes.

Figure 93: Analysis (Author, 2011)

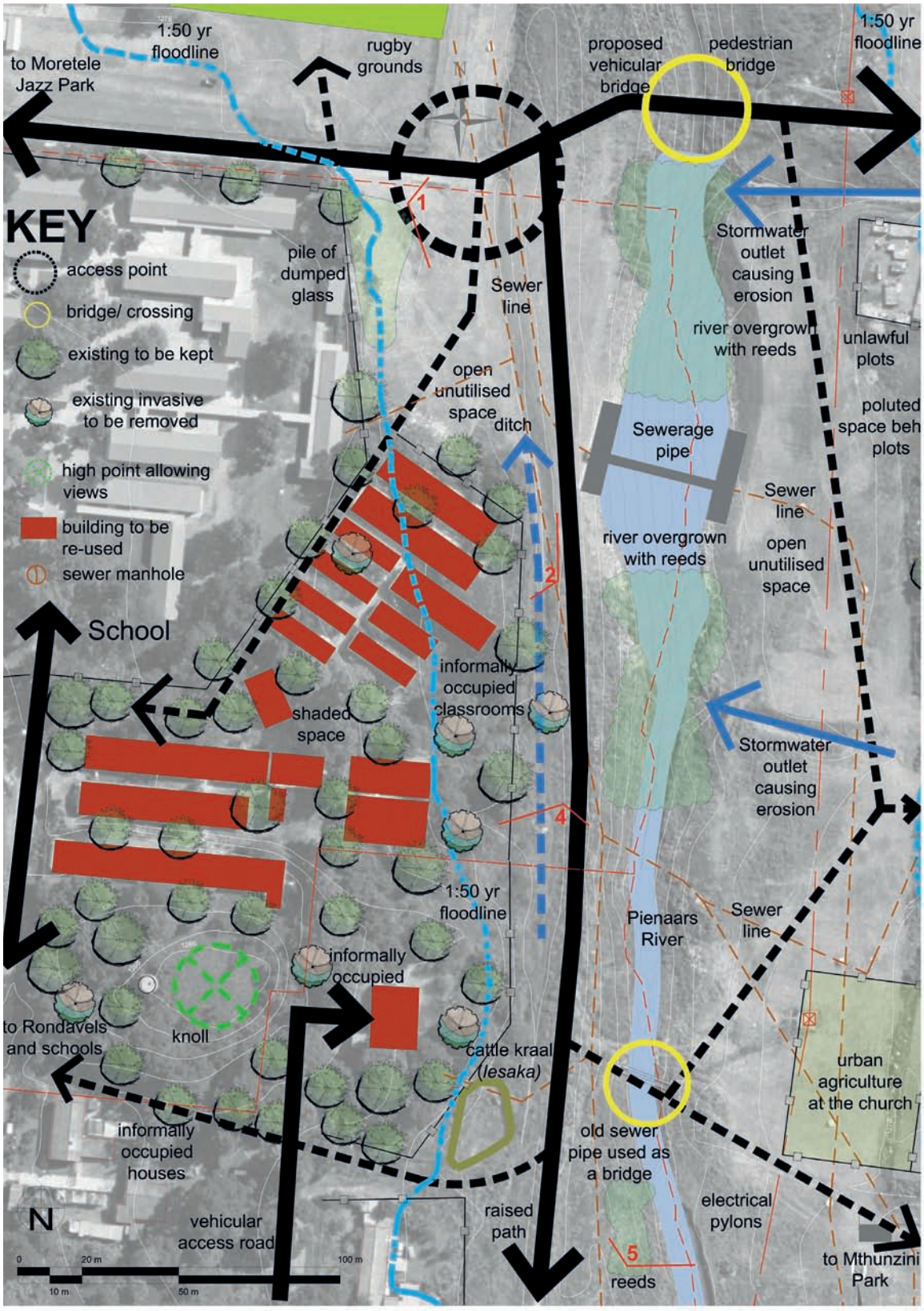


Figure 94: View of river from the bridge (Author, 2011)

Figure 95: Informally occupied building (Author, 2011)

Figure 96: Tree to provide shading (Author, 2011)

Figure 97: Raised pathway (Author, 2011)

Figure 98: View towards Magaliesberg Mountains

Figure 99: Old sewer pipe used as a bridge'

8.4.3. Space, Form and Meaning: Sketch plan development

According to Dee (2001:72), as landscape structures, walls can be used in design to link architecture and landscape or to 'connect' a site to its underlying geology, thereby creating regionally distinct space. In lapa system they are sometimes used to link different spaces. The choice of materials will therefore be very important in either linking or contrasting these depending on the effect the author is looking for. Walls can be conceived of as backdrops onto which images may be projected, words written or dramas and games played out (Dee, 2001:72). The walls sometimes form play structures for children who like climbing onto things. The users are allowed to re/appropriate the walls and use them in ways that best suit them.

When these two generators, river and *lapa*, are expressed in the landscape they

The first residents in Mammelodi sitting outside the new rondavels in the lapas. The design of the garden, importance of the gate and its notice reflects an urbanity which defies the countrified housing. (Photo: PCC, 1947).

Figure 100: Rondavels with lapa in Mamelodi (Walker & Van Der Waal, 1991: 8)

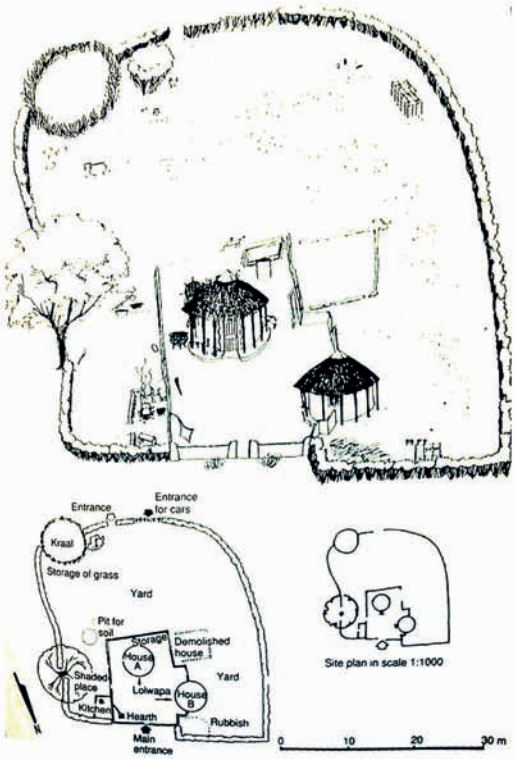
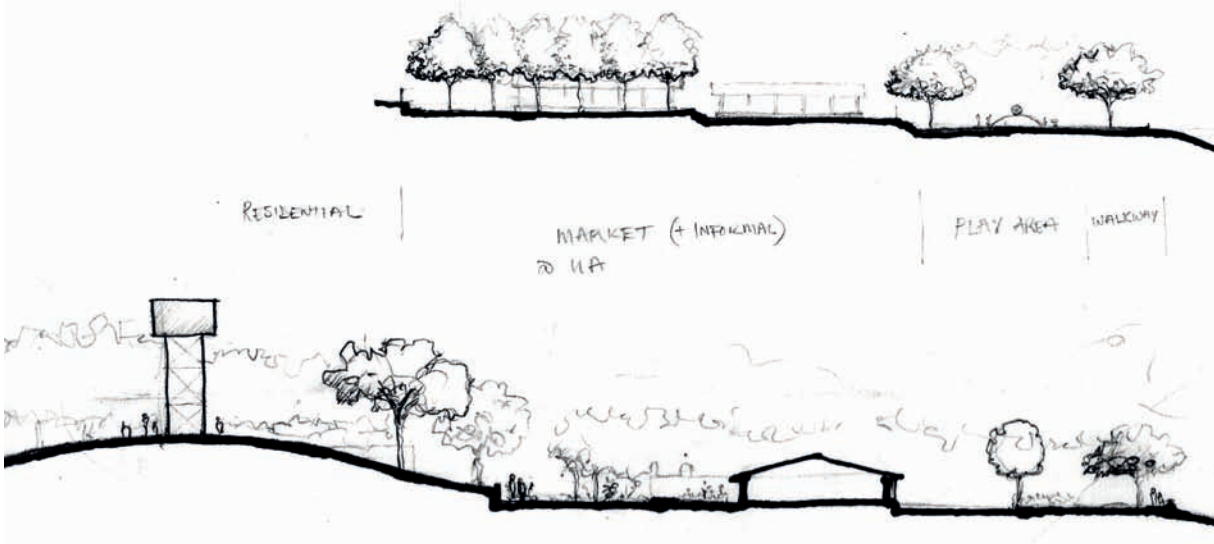


Figure 101: A typical plan of a dwelling unit belonging to one household (Silitshena & Mcleod, 1992: 239)



can form context distinctive and inviting social spaces. Paths brought closer to the water's edge allow people to connect with nature and perform religious rituals. This can be heightened where the river has plant and animal life. Bridges and boardwalks can be used to access and cross the river especially in areas that fall within the floodlines. This form can be used, following contours, to define the pathway system and used in conjunction with the dwarf walls to define spaces along the boulevard. The organic shape can be used to link spaces and define transition zones between the water's edge and the built environment (Figure 105-113).

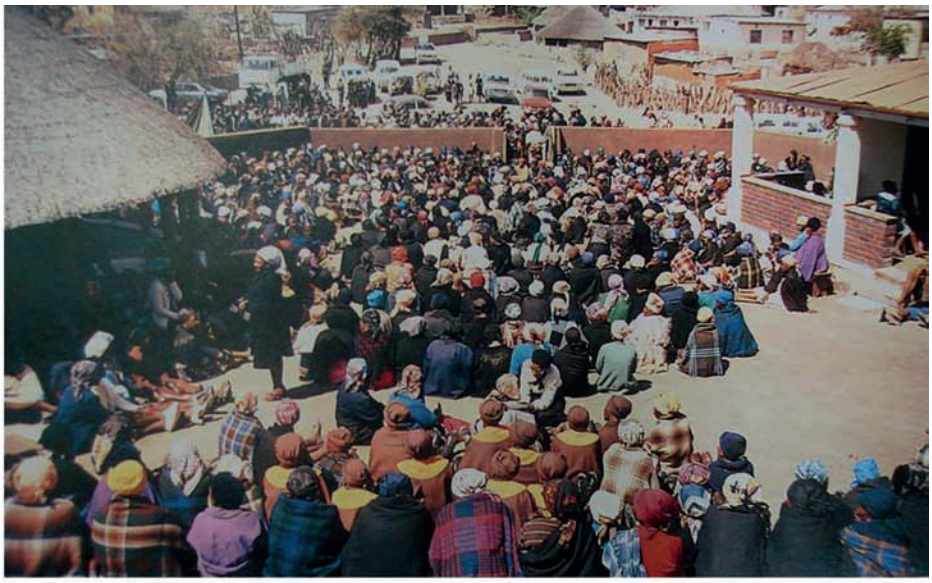


Figure 102: Lelwapa in Mochudi, 1981 hosting a funeral service (Grant & Grant, 1995: 39)

Figure 103: View from lapa towards the river in Ranaka, Botswana (Author, 2011)

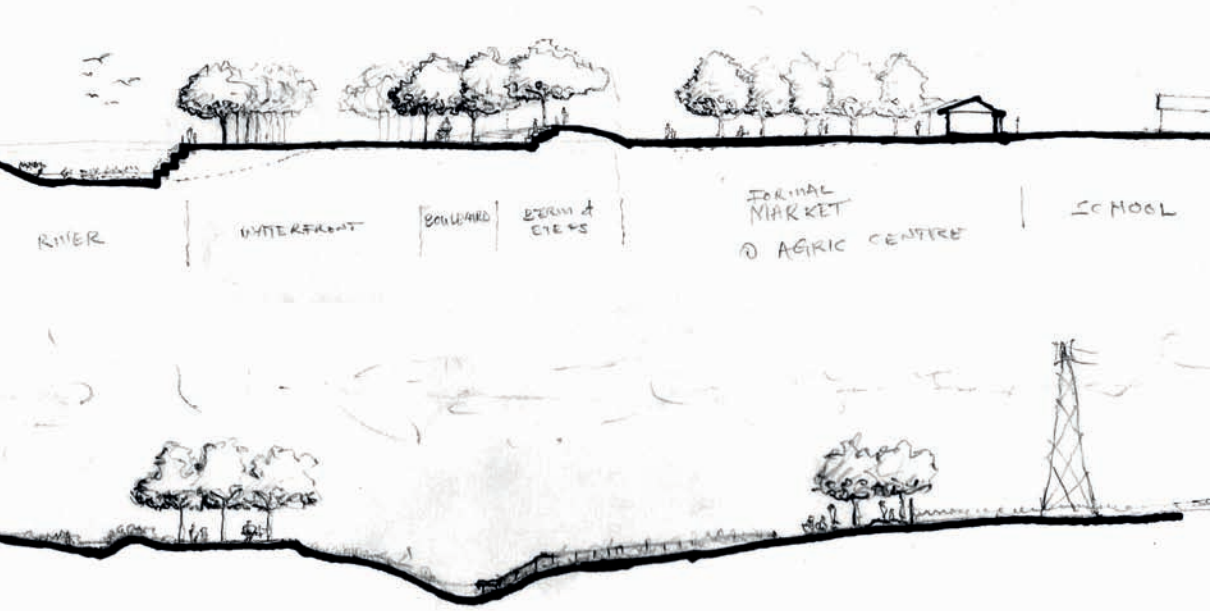
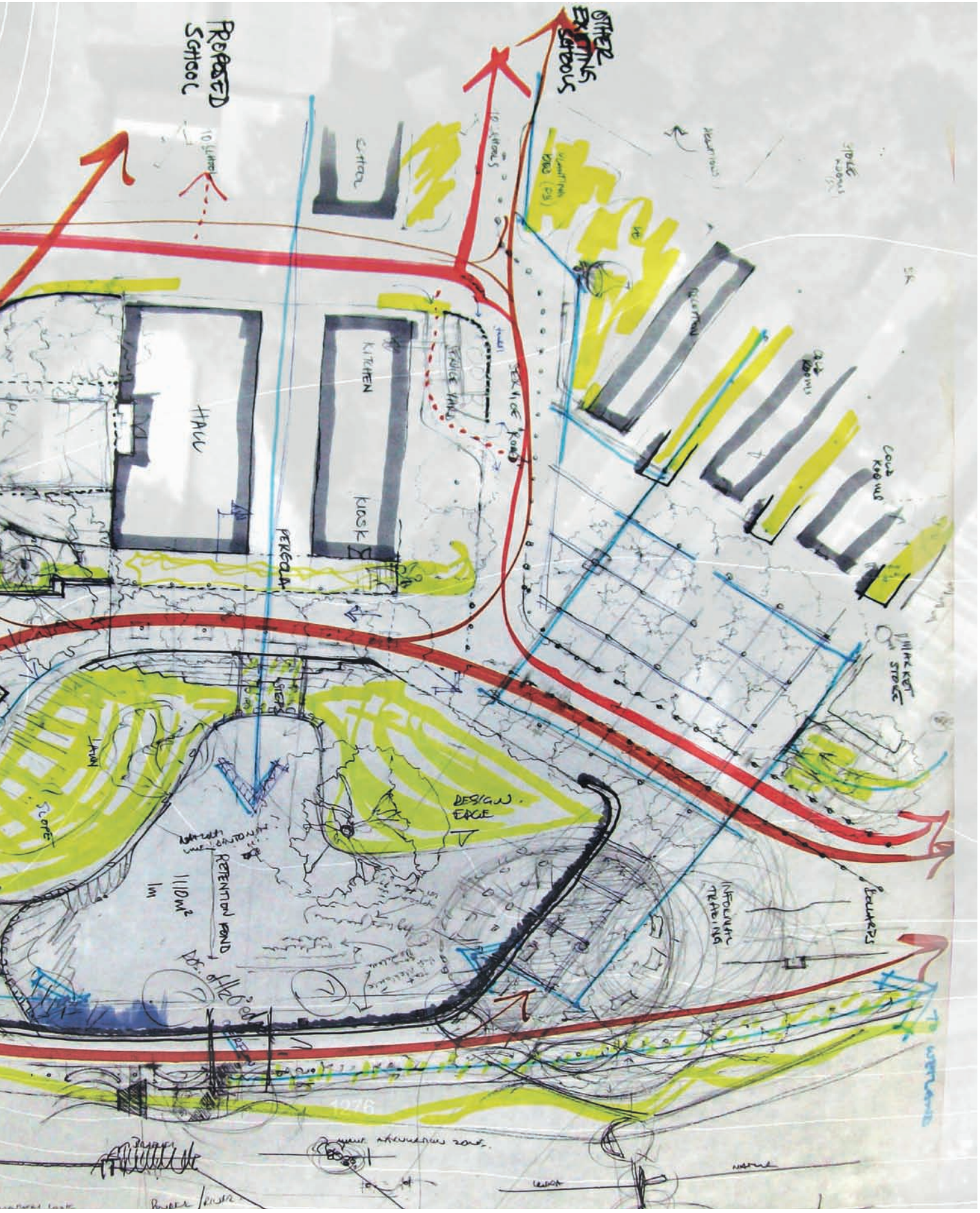


Figure 104: Concept sections showing relationship of built environment to the river's edge (Author, 2011)

Figure 105: Improving community facilities (Author, 2011)

Figure 106: Creaiting community sapces along river's edge (Author, 2011)

Figure 107: Sketch plan concept (Author, 2011)


PROPOSED SCHOOL
HALL
KITCHEN
KIOSK
PERGOLA
DESIGN EDGE
RETENTION POND
LAWN
SLOPE
1110m²
1m
INFORMAL TRADING
BOULDERS

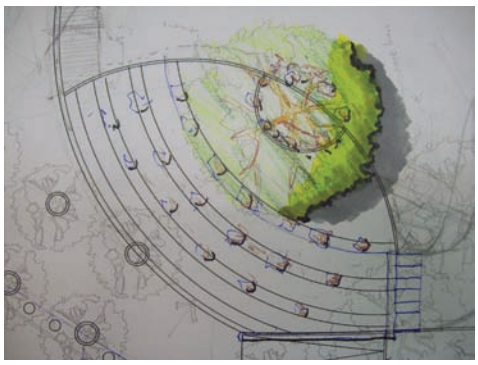


Figure 108: creating seating under tree (Author, 2011)

Figure 109: Building spills out into landscape (Author, 2011)

Figure 110: River's edge mimicks the form of the river (Author, 2011)

Figure 111: Retaining walls become seating (Author, 2011)

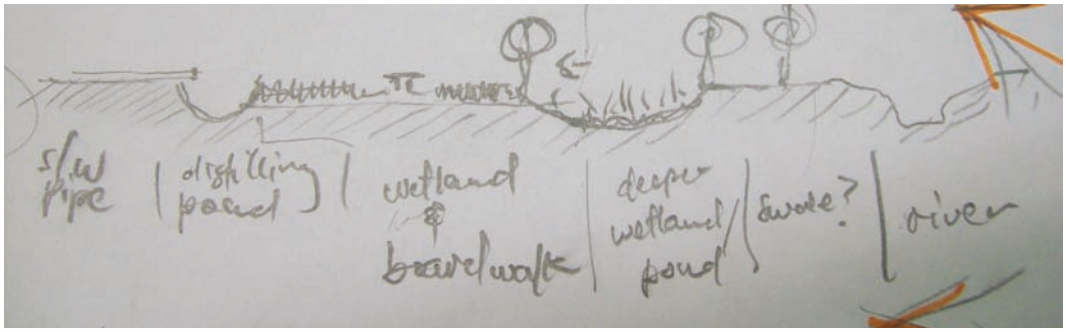


Figure 112: Treating stormwater (Author, 2011)

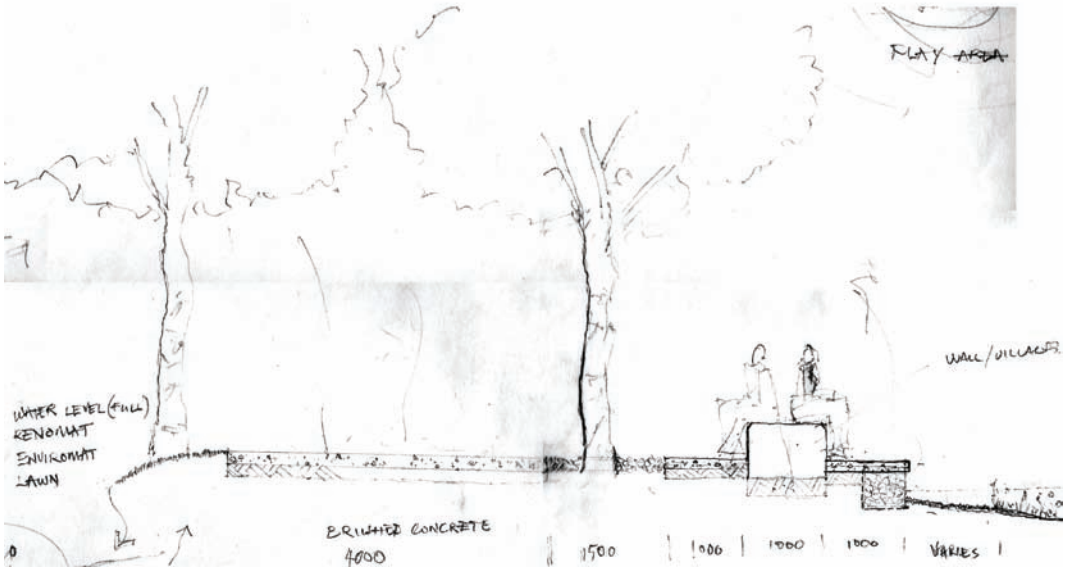


Figure 113: Creating interactive spaces along the river's edge (Author, 2011)

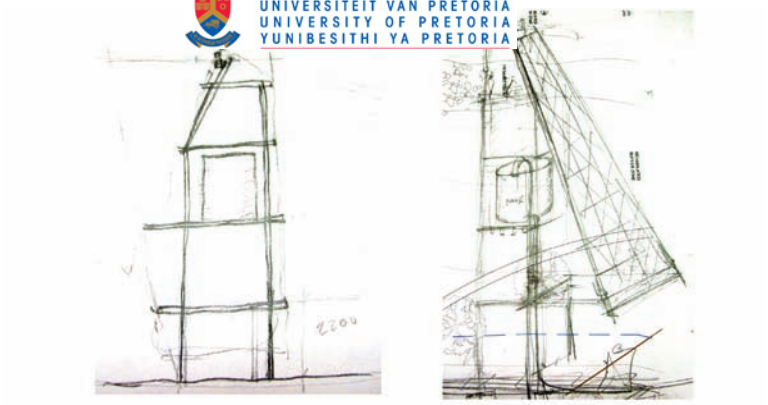
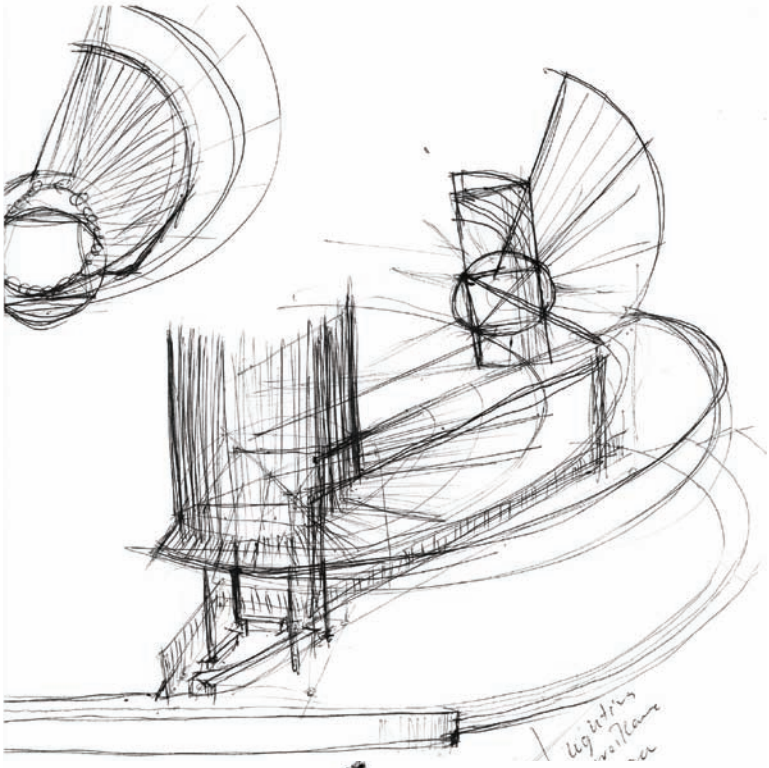


Figure 114: Tower - designing a landmark (Author, 2011)



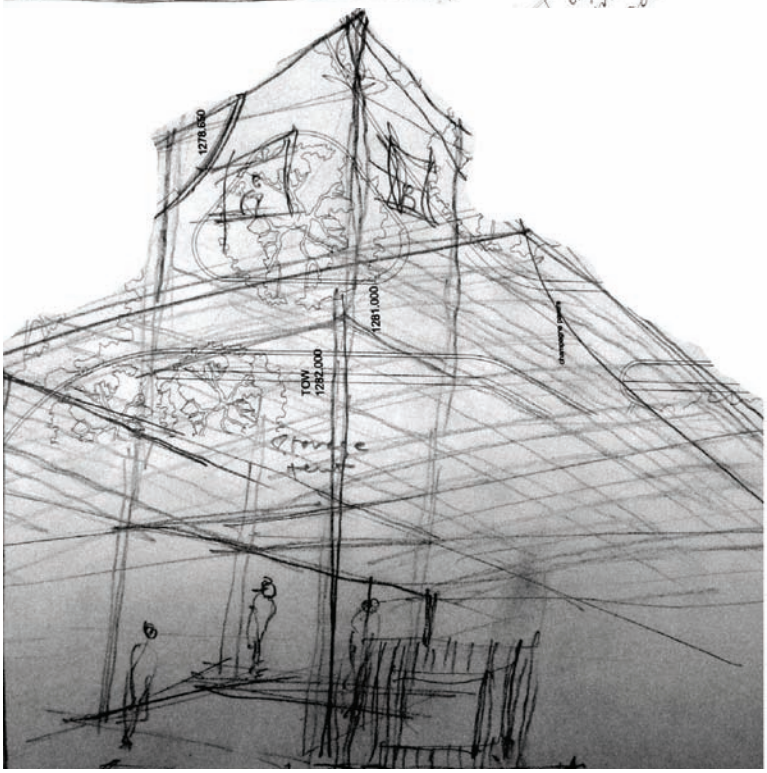


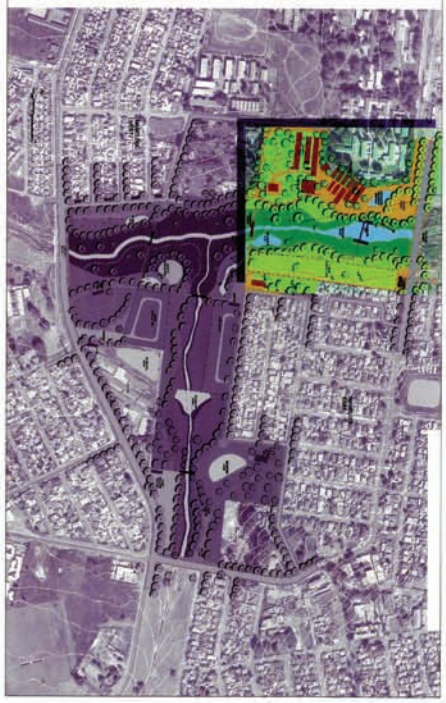
Figure 115: Tower - roviding surveillance (Author, 2011)

Figure 116: Sketch Plan (Author, 2011)

LEGEND

- POST TOP LIGHT
- LITTERBIN
- MARQUE-TENT AREA
- SEATING WALL
- TREE SURROUND
- PLAQUE
- TABLES, CHAIRS & UMBRELLAS
- BOLLARD
- HANDRAIL
- SCREEN WALL

LOCALITY PLAN



8.5. SKETCH PLAN

The sketch plan layout and functioning features shared meeting spaces as outdoor rooms of different sizes for gatherings and interaction creating new connections along the river system. It grows from the *parti* diagram in that it uses continuous movement pathways along the green spine that connects people but most importantly orientates them to the linear public open space to celebrate their efforts in joining the previously disconnected community.

The designs pushes back the floodline towards the river by using cut and fill process to take soil from the proposed wetland and ponds and use it to fill the area creating an elevated surface. This solves the problem of buildings being flooded while also opening up the spaces between the buildings and the river for community use.

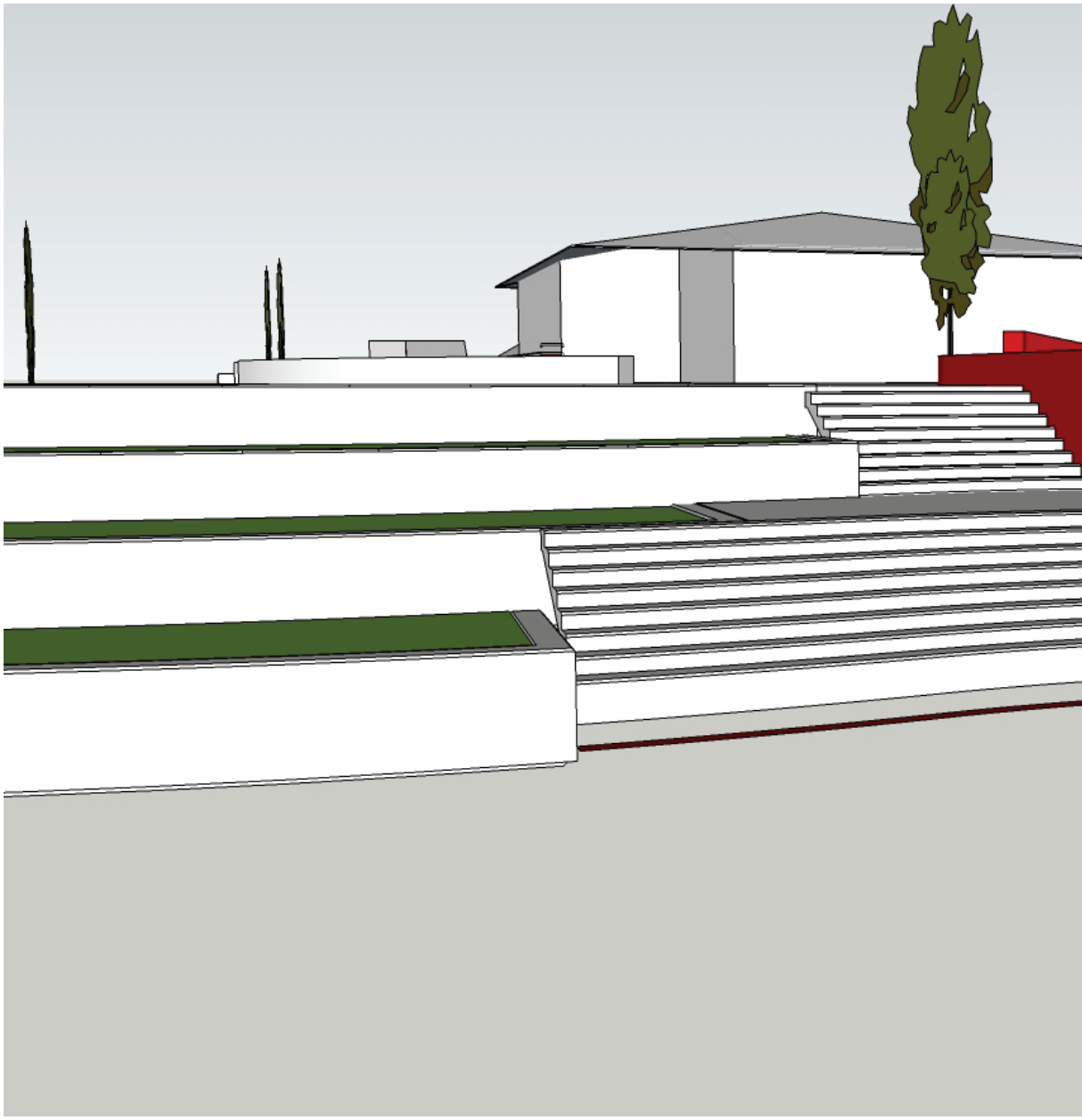


Figure 117: Information Centre, steps, terraces and ramp (Author, 2011)

8.5.1. Community Centre

The Centre includes an office, kiosk, kitchen and hall that will also serve the school. It will function as the main hub for the community. The office, using the old guest house is located at the south. It will serve as information point for the community and visitors. Because it is elevated (Figure 117) compared to other buildings, it will provide for a lovely view towards the river and over other activities around the Agricultural and Community Centre.

The hall area hosts a spill-out area where students and other community members can sit and enjoy their meals from the kiosk and kitchen in a more enclosed and quieter space under the large existing Jakaranda trees. The hall will host school and community indoor meeting and other functions like parties and weddings. Users are again invited to sit on the terraces and lawn (Figure 117) area that take advantage of the natural slope and face the central pond, events area and the river.

8.5.2. Seating Wall, River Edge and Bridge

A wooden boardwalk and bridge provide crossing of the river linking the community centre to the rest of the park and residential area to the east of the river. The bridge (Figure 118) sits just above the 50 year floodline allowing the minimal contact with the riverine area while keeping users safe in times of floods.

The river edge is divided into the grassed kick-about area along the pathway and bicycle track (Figure 119) as well as the riverine area. The soilcrete pathway separates the *cynodon dactylon* area from the naturalised veld grass area making it easier to maintain while defining a definite edge for children to know when they are close to the river water line.

Figure 118: Bridge (Author, 2011)

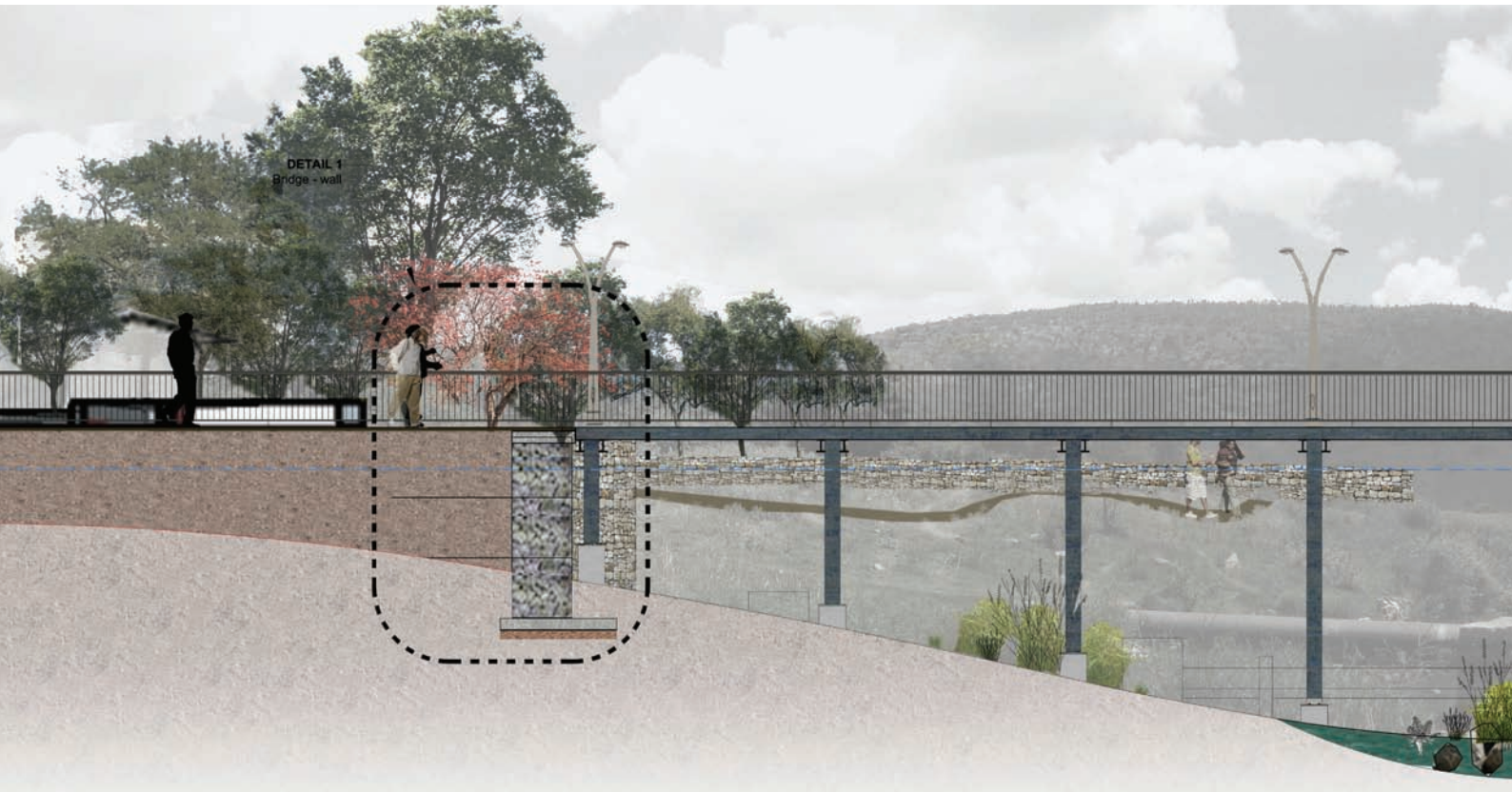


Figure 119: Shaded seating along pathways (Author, 2011)

8.5.3. Wetland, Fish Pond and Zero-Depth Water Feature

Water elements/ structures use recycled water to form the central magnet of this site pulling together other spaces in front of the building and linking them to the river's edge. The terraced wetland (Figure 122) area lets-in water from the treatment chambers where water goes through an oil trap and ultraviolet treatment making it safe to play. Colourful indigenous planting in the wetland attract wildlife from the river while forming a soft edge transition from the hard pathway paving to the pond. The fish pond (Figure 121) is kept at a constant water level throughout the year taking only the amount needed from the treatment wetlands off-site.

Figure 120: A well lit river system (Author, 2011)

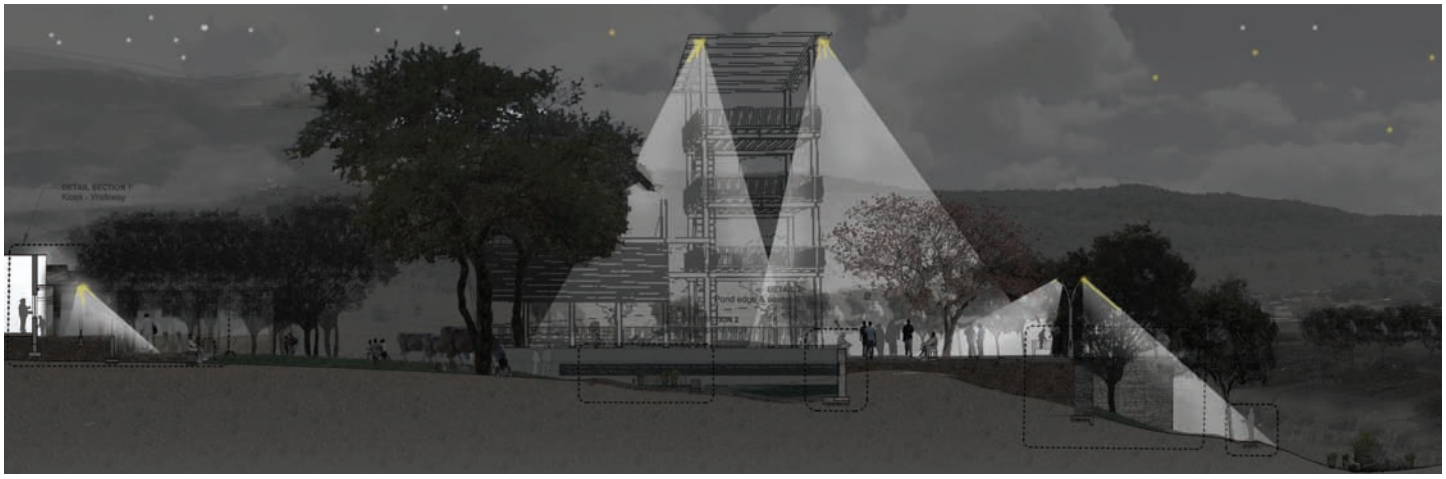


Figure 121: Creating people-spaces (Author, 2011)

A zero-depth water feature (Figure 122) uses water from the solar powered pump to achieve a risk play area while parents are provided with seating all around the water area enabling them to keep an eye on their children. The solar pump circulates the water in the pond making sure it's aerated to oxygenate it especially during the day.

Figure 122: View of the wetland and river's edge (Author, 2011)

8.5.4. Events Space and Surveillance Tower

The events space (Figure 123) is an open paved space for multiple activities like weddings, gatherings, small concerts, play and motion picture shows. The space can be covered with tents of sizes not larger than 400 square metres to support the hall.

Figure 123: Events space (Author, 2011)

Figure 124: Events space at night (Author, 2011)

The tower forms a multifunctional landmark (Figure 123-125) in this area with attached uses like surveillance cameras, a shade structure, water storage for irrigation and a support structure for the solar panels that capture the sun's energy for pumping water from the pond to the zero depth water feature and from the greywater treatment ponds to the tower then the agricultural centre where it is used for cleaning vegetables before packaging. The tower also provides floodlighting at night keeping the area safe (Figure 124).

Figure 125: Defining pedestrian and vehicular circulation (Author, 2011)

8.5.5. Agricultural Centre and Informal Market

The gricultural centre and market located on the northern end of the boulevard employ residents, being a place to sell vegetable from the local gardens as well as being a place for agricultural education for the township. The centre spills out onto a Celtis grove area and open air informal market where farming produce and associated activities are taken out into the public spaces. The Celtis grove provides ample seating under the trees where people will have conversations about daily life. It will also allow the visitors to see the vegetables being packaged and sold.

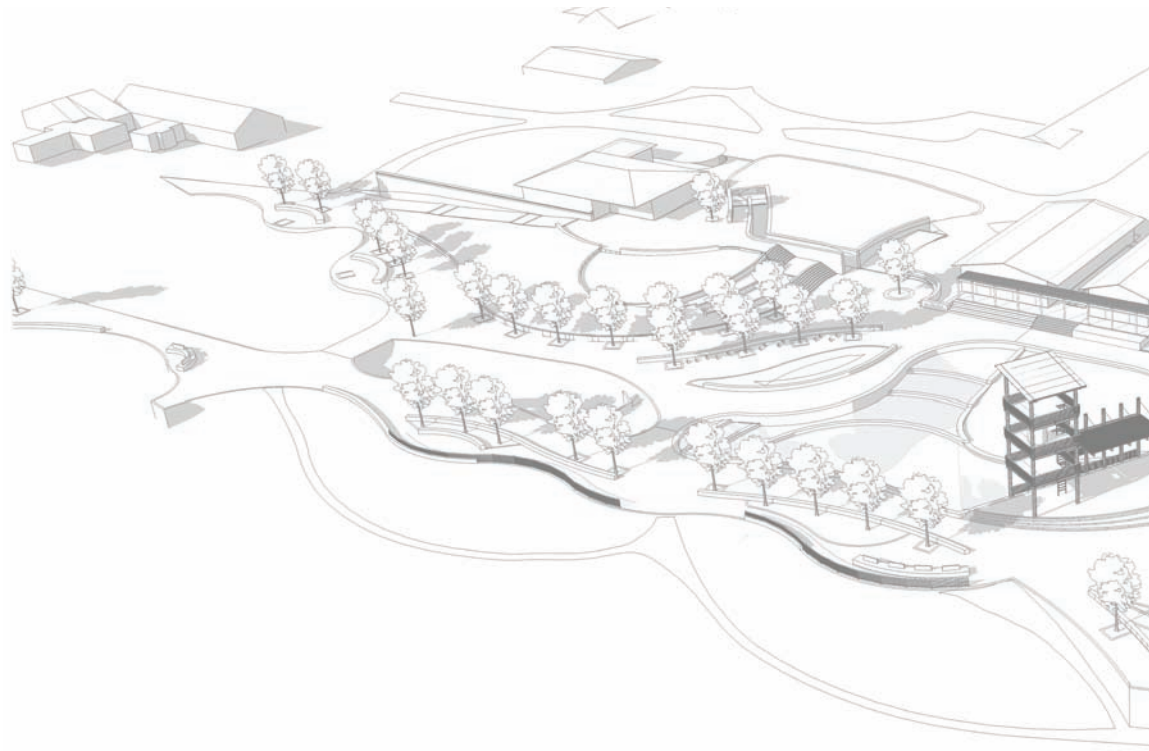
Service access for vehicular is limited to the bollard lined path (Figure 125-126) that also separate the Celtis grove from the events space. There is no material change in paving to show that the area is a pedestrian orientated space.

8.5.6. Picnic and Braai Facilities

The eastern side of the river features open green areas with a strings of walkways mimicking the flow of the river. It stays relatively less busy and repairs the area that experienced erosion caused by a stormwater outlet pipe inside the flood plain. The outlet is moved to a wetland outside the floodlines and the area if turned into a siltation wetland and pond for the excess water coming from the vegetable garden. The water from the pond is solar pumped to a storage water tower in the garden for reuse in irrigation.

Ample seating under trees and braai facilities area provided closer to the pond to attract picnickers and strollers to these quieter areas. The use of the soilcrete pathway to separate the grassed area from naturalised area is also applied here. The pathways can be used by joggers for exercising.

Figure 126: Axonometric drawing of the focus project (Author, 2011)

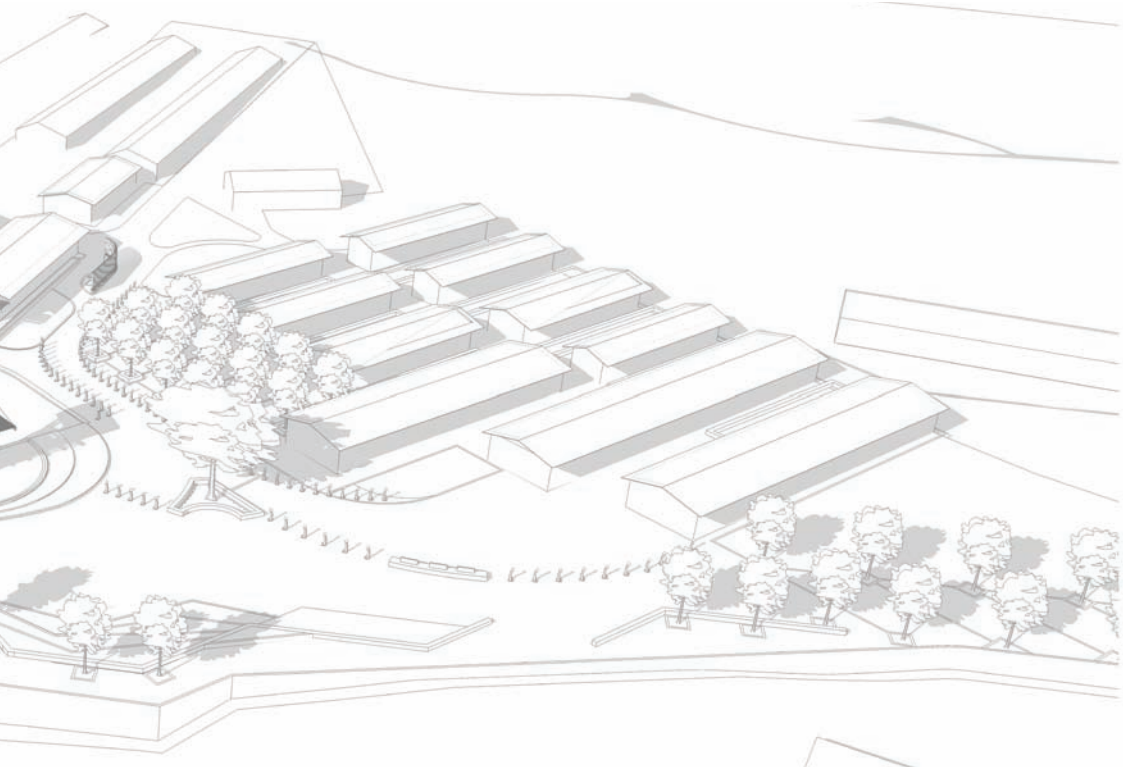


8.6. CONCLUSION

In an attempt to design a meaningful community place, the project has employed the following design principles as introduced and discussed in chapter 6:

- Community design
- Safety
- Connection and linkage
- Integration of uses
- Robustness
- Sustainability

The chapter concludes that the design (Figure 126) was able to manipulate the contours and reposition the floodline which consecutively allowed the author to reprogram the created open spaces above the floodlines into events spaces, play areas and market for public use. The proposed functions for the reprogrammed buildings allows for supportive activities that will activate the area for long hours, including in the evenings when the hall and event space hosts movie shows and concerts. All these spaces show a response to the river edge connecting people visually and physically to the water's edge. The dwarf wall derived from the Tswana's *lapa* system is used as an architectural element to define spaces, access points, provide seating and become a play structure that children can climb onto. It takes different forms mostly 'natural', mimicking the form and flow of a river. The design also demonstrates how stormwater could be reused for both aesthetic and sustainability reasons in ponds and for irrigation. The central water area holds the spaces together and creates a sense of arrival at the community and agricultural centre both from the north and south. Indigenous planting is used in the wetlands and elsewhere while robust materials are chosen for paving and seating.



CHAPTER

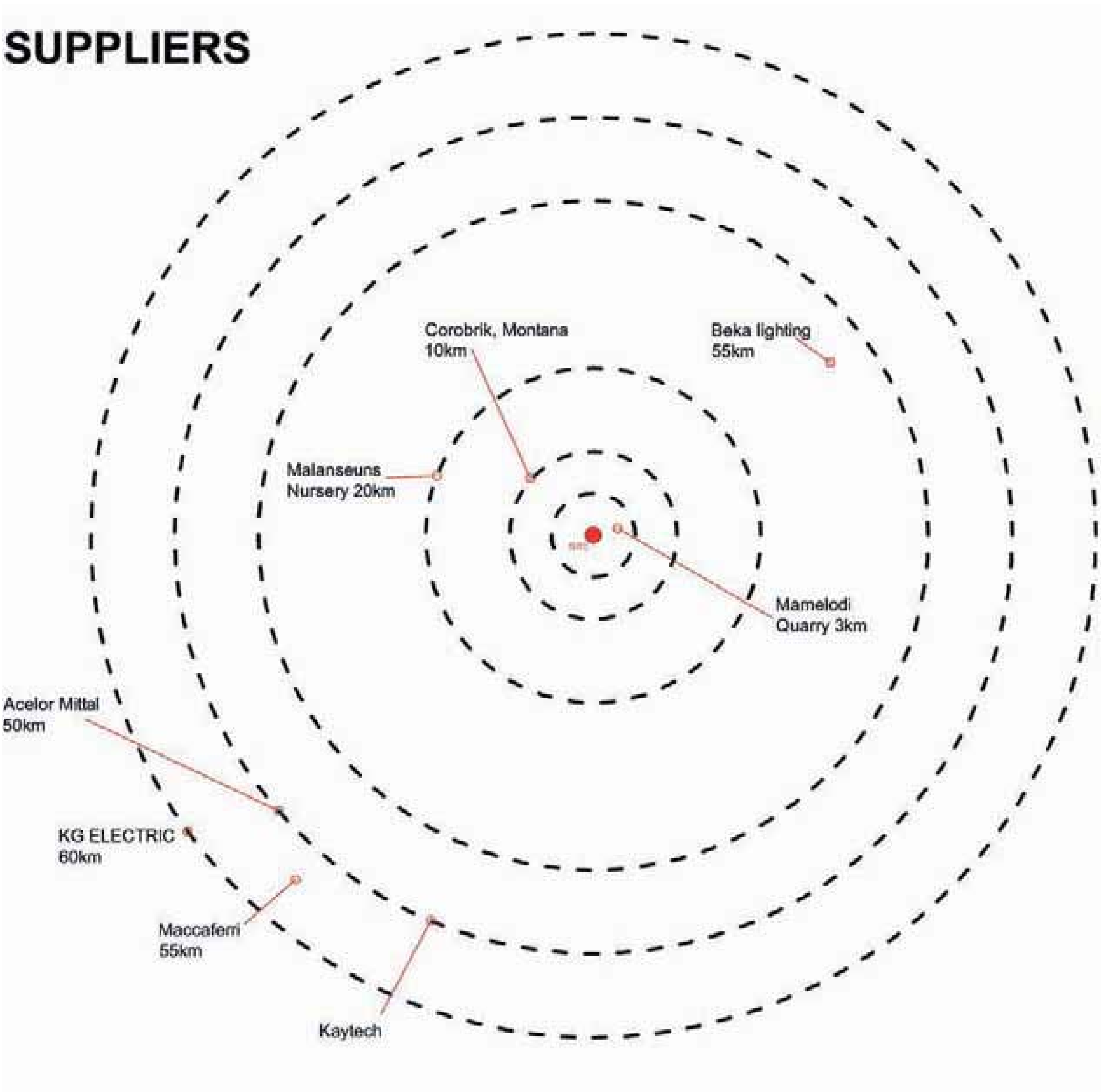
9

TECHNICAL RESOLUTION

9.1. INTRODUCTION

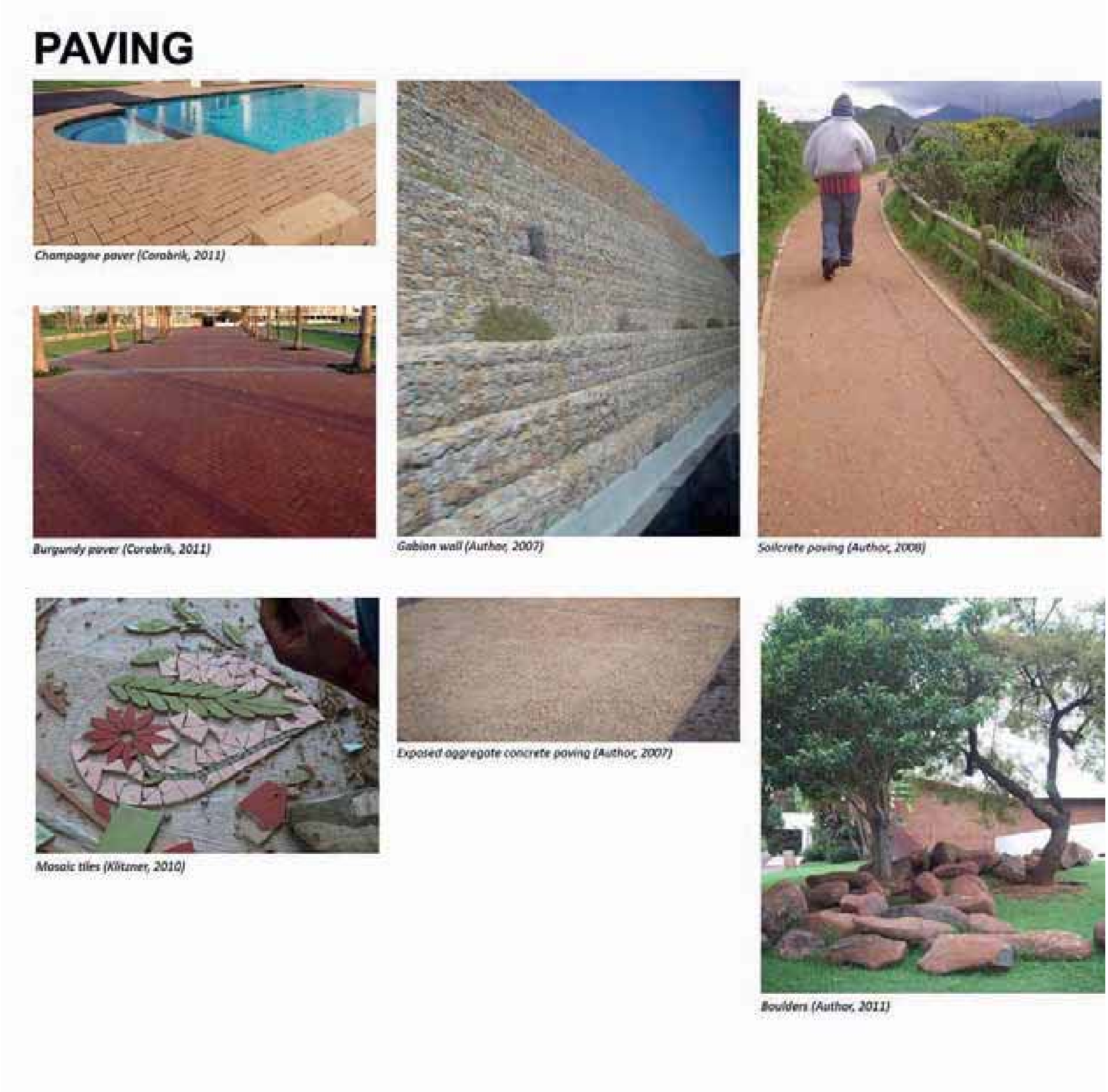
This chapter explores in detail the technical aspects of the project to meet the set design principles discussed in the last chapter. The philosophy behind the material [illegible]

[illegible] Distance to [illegible]



9.2. MATERIAL SELECTION

Structures in public spaces are usually prone to damage due to frequent use by [illegible] choice of materials therefore form the start should aim for durable materials that [illegible] possibility of being reused and/or re-appropriated. The materials used should also [illegible]



[illegible] *Paving*
[illegible]

Concrete : *In situ* 2ũ ăKdzğŜN Ŏ2yŎNŜúŜ ǿƛff ōŜ dzăŜŘ ŦƧN úKŜ Ŏ2yăúNdzŎə2y 2Ŧ úKŜ ăŎdzfLJúdzNlŀf ăŜlŀəyƎ lŀyŘ NŜúlŀƛyƛyƎ ǿlŀfŦãǾ ¢KŜ fƧŎlŀf flŀō2dzNŜNă ǿƛff ƛYLJNƧØŜ úKŜƛN ăʅƛffã ƛy Ŏ2yŎNŜúŜ Ŭyƛ̃ăKƛyƎ lŀyŘ l ŘƛũŜNŜyúƐ ŎKŜlŀLJŜN lŀyŘ Y2NŜ ădzăúlŀƛylŀōfŜ lŀLJLJN2lŀŎK úƨ Ŏ2yăúNdzŎə2y ƛă LJN2Y2úŜŘǾ 9ÈLJ2ăŜŘ lŀƎƎNŜƎlŀúŜ Ŏ2yŎNŜúŜ Klŀă ōŜŜy ŎK2ăŜy ƦƧN úKŜ ăúŜLJă lŀyŘ NlŀYLJăǾ Lú LJN2ØƛŘŜă l y2yπăfLJLJŜNè ădzNƦlŀŎŜ ŎNdzŎƛlŀf ƛy LJdzōfƛŎ ăLJlŀŎŜă ǿKƛfŜ úKŜ ŜÈLJ2ăŜŘ lŀƎƎNŜƎlŀúŜ lŀff2ǿă ƛú úƨ ōfŜyŘ ǿƛúK úKŜ ylŀúdzNlŀf flŀyŘăŎlŀLJŜǾ . ŜŎlŀdzăŜ 2Ŧ Ŏ2yŎNŜúŜƣă ØŜNălŀəfƛúè lŀff2ǿă ƛú úƨ ōŜ ƦƧNYŜŘ ƛyúƨ ŘƛũŜNŜyú ăKlŀLJŜă ǿKƛfŜ úKŜ 2ũ ăKdzğŜN Ŭyƛ̃ăK ƎŜúă lŀy 2fŘ f22ʅ 2ØŜN əYŜƧ lŀă úKŜ flŀyŘăŎlŀLJŜ lŀfã2 ŎKlŀyƎŜă ǿKƛfŜ ƛú remains durability.

Clay paver Y úKŜ Yŀlƛy LJlŀúKǿlŀèă ǿƛff ōŜ LJlŀØŜŘ lŀyŘ ŜŘƎŜŘ ǿƛúK /Klŀ YLJlŀƎyŜ óCƛƎdzNŜ мнyú lŀyŘ .dzNƎdzyŘè Ŏfŀlè LJlŀØŜNăǾ ¢KŜè lŀNŜ ăŜfŜŎúŜŘ ŦƧN úKŜƛN lŀŜăúKŜəŎ ljdzlŀfƛəŜă lŀăă2ŎƛlŀúŜŘ ǿƛúK ylŀúdzNlŀf Ŝlŀ̃NüK Ŏ2f2dzNăƧ Ŝlŀ̃ăŜ 2Ŧ flŀèƛyƎ lŀyŘ ŘŜŎ2yăúNdzŎə2y ǿKŜNŜ necessary.

Soilcrete óŎŜYŜyű ăűlŀōƛfăŜŘ ă2ƛfű ƛă dzăŜŘ ƛy úKŜ ăŜyãƛəØŜ NƛLJlŀNƛlŀy Î2yŜă 2y LJlŀúKă Ŏ2Yƛy Ŏf2ăŜN ű2 NƛØŜN ŜŘƎŜǾ . ŜŎlŀdzăŜ 2Ŧ ƛúă ylŀúdzNlŀf f22ʅ ƛú ōfŜyŘă ǿƛúK úKŜ flŀyŘăŎlŀLJŜǾ {2ƛfŎNŜúŜ ƛă lŀfã2 ŦlŀƛNfè ăűlŀōfŜ ƛy ǿŜú lŀyŘ ŦNŜljdzŜyúfè ƀ22ŘŜŘ lŀNŜlŀă Lú NŜljdzƛNŜă y2 ăʅƛffŜŘ flŀō2dzN LJN2ØƛŘƛyƎ Y2NŜ 2LJLJ2Núdzyƛ̃ăŜă Ŧ2N úKŜ fƧŎlŀf ǿ2NʅŜNăǾ

Gum poles lŀNŜ ăŜfŜŎúŜŘ Ŧ2N úKŜƛN Ŝlŀ̃Ŝ 2Ŧ Ŏ2yăúNdzŎə2y lŀyŘ lŀăă2Ŏƛlŀə2y ǿƛúK úNlŀŘƛə2ylŀf ōdzƛfŘƛyƎ YŜúK2Řăǿ ¢KŜ fƧŎlŀf Ŏ2YYdzyƛúè ƛă ŦlŀYƛfƛlŀN ǿƛúK úKŜY ăƛyŎŜ úKŜè lŀNŜ fƧŎlŀffè dzăŜŘ Ŧ2N ŜNŜŎəyƎ úŜyűă lŀyŘ 2úKŜN ăKlŀŘŜ ăúNdzŎúdzNŜăǾ ¢KŜè ƎŜú ƎNŜè ǿKŜy ŜÈLJ2ăŜŘ ú2 ǿŜlŀúKŜN Ŏ2yŘƛə2yã 2ØŜN əYŜ ōŜŎ2YƛyƎ LJlŀNú 2Ŧ úKŜ flŀyŘăŎlŀLJŜǾ /NŜ2ălŀúŜ úNŜlŀúŜŘ ƎdzY LJ2fŜă ǿƛff ōŜ dzăŜŘ Ŧ2N úKŜ LJŜNƎ2flŀ lŀyŘ úKŜ ú2ǿŜNăǾ

Mild Steel Y Dlŀfǿlŀyƛ̃ăŜŘ YƛfŘ ăűŜŜf ƛă ŎK2ăŜy ōŜŎlŀdzăŜ 2Ŧ ƛúă ăúNdzŎúdzNlŀf ăúNŜyƎúK Ŧ2N úKŜ Ŏ2yăúNdzŎə2y 2Ŧ úKŜ ōNƛŘƎŜǾ Lú ƛă fƧŎlŀffè lǿlŀflŀōfŜ ƛy ŘƛũŜNŜyú ăKlŀLJŜă lŀyŘ Ŧ2NYăǾ ¢KŜ Ylŀúŝ Nƛlŀf ƛă lŀfã2 ăŜfŜŎúŜŘ Ŧ2N ƛúă ŘdzNlŀōƛfúè lŀyŘ Ŝlŀ̃Ŝ 2Ŧ ƨ2ƛylƎ ōè ǿŜfŘƛyƎǾ Dlŀfǿlŀyƛ̃ăŜŘ YƛfŘ ăűŜŜf ƛă NŜăƛăúlŀyú ú2 Ŏ2NN2ăƛ2y YlʅƛylƎ ƛű ƛŘŜlŀf Ŧ2N dzăŜ 2dzűăƛŘŜǾ Lú ƛă lŀfã2 NŜlŀŘƛfè lǿlŀflŀōfŜ fƧŎlŀffèǾ

Natural stone Y . 2dzfŘŜNă NŜŎ2ǿŜNŜŘ ŦN2Y ăƛúŜ lŀNŜ dzăŜŘ lŀă ăŜlŀəyƎŁ ŜŘƎƛylƎ Ylŀ̃úŜNƛlŀf ŦŜlŀúdzNŜă ƛy úKŜ flŀyŘăŎlŀLJŜ lŀă ǿŜff lŀă ʅŜŜLJƛylƎ úKŜ ŎdzfúdzNlŀf lŀyŘĸ2N Kƛăűƛ2NŘŎlŀf ǾlŀfdzŜǾ {ű2yŜ ŦN2Y a lƎlŀfǾŜăōŜNƎ ljdzlŀNNè ƛă dzăŜŘ ú2 Ufff Ǝlŀōƛ2y lŀyŘ NŜy2Ylŀűă lŀă NŜűlŀƛylƎ ǿlŀffă lŀyŘ ŜN2ăƛ2yŎ2yűN2f ăúNdzŎúdzNŜăǾ

Tyres : /lŀN úèNŜă ălŀfǾlŀƎŜŘ ŦN2Y úKŜ LJN2ƨŜŎű lŀNŜlŀ lŀNŜ lŀfã2 Ŏ2ffŜŎúŜŘ lŀyŘ NŜdzăŜŘ ƛy úKŜ flŀyŘăŎlŀLJŜ lŀă ăŜlŀəyƎ ƛy úKŜ ŎKƛfŘNŜyǾă LJfƛlè lŀNŜlŀăǾ ¢èNŜă Klŀ̃ØŜ ōŜŜydzăŜŘ ōè ʅŘă ƛy úKŜ ú2ǿyăKƛLJ lŀă LJfƛlè ¶ű2èăǾ ǿKƛfŜ ǿ2YŜydzăŜ úKŜY lŀă ƀ2ǿŜN LJ2ûăǾ ¢KŜè lŀNŜ lŀfã2 lŀăă2ŎƛlŀúŜŘ ǿƛúK úKŜ NƛŎK ¶ōdzăK YŜŎKlŀyƛŎǾ ōdzăƛyŜăă ƛy a lŀYŜf2Řƛǿ

Dfŀlăă ō2ğfŜă Y .ŜŜN ō2ğfŜă Ŧ2NY l Yŀƨ2N Klŀ̃Îlŀ NŘ Ŧ2N ŎKƛfŘNŜyˊLJfƛlèƛyƎ lŀf2yƎ úKŜ NƛØŜN lŀyŘ ălŀfǾlŀƎyƎ úKƛă Ylŀúŝ Nƛlŀf Ŧ2N l Y2NŜ ădzăűlŀƛylŀōfŜ lŀyŘ ălŀŦŜN dzăŜ ƛă ØŜNè ƛYLJ2Núlŀyűǿ C2N úKƛă NŜlŀă2yŁ Ǝfƛlŀăă ō2ğfŜă lŀNŜ dzăŜŘ lŀă l ŬfffŜN ű2 ōdzƛfŘ Ŏ2f2dzNŦdzf ŦŜlŀúdzNŜ ǿlŀffă óCƛƎdzNŜ мооú ƛy úKŜ flŀyŘăŎlŀLJŜ úKlŀű ŦdzNúKŜN Yƛylƛ̃Yƛ̃ÎŜă úKŜ dzăŜ 2Ŧ Ŏ2yŎNŜúŜǾ

9.3. PLANTING PALETTE

¢ŔŜ a l·űŜℕλl·fã tfl·y´óCλƎdzℕŜ мολύ dzăŜă l· LJl·fŜğŜ óCλƎdzℕŜ мнфύ Y´2ăűfẽ Ŏ2YLJℕλăŜŘ 2Ŧ plants that are indigenous to the area as listed in chapter 4 and is culturally and űℕl·Řλə2yl·ffẽ ăλƎyλŬŎl·yű λy´űŔl·ú űŔŜè l·ℕŜ dzăŜŘ YˆŜŘλŎλyl·ffẽΣ ƎNl·Îλy∃ ƒØŜăű2Ŏ]Σ Ŕl·ØŜ ŜŘλōfŜ LJl·Nűă 2ℕ l·ℕŜ l·ăă2Ŏλl·űŜŘ ǿλűŔ l· Ŏdzfűdzℕl·f l·Ŏə∅λűè℗ hűŔŜℕ LJfl·yűă l·ŘŘ ŎŔl·Nl·ŎűŜℕ ű2 ăLJl·ŎŜă ōl·ăŜŘ 2y´úŔŜλN ăűNdzŎűdzℕŜΣ Ŏ2f2dzN 2N ăλÎŜ ǿŔλfŜ ă2YˆŜ Ŏ2yűNλōdzűŜ ű2 űŔŜ NλØŜℕ ŜŎ2f2Ǝè ōè ŎfŜl·yλy∃ űŔŜ ăèăűŜY 2N l·ğNl·Ŏəy∃ ǿλfŘƒƬŜ℗ 5ℕ2dzƎŔű NŜăλăúl·yű LJfl·yűă l·ℕŜ l·fã2 LJNŜƬŜℕℕŜŘ℗ ¢ŔŜ l·dzűŔ2N ƎλØŜă ă2YŜ ¢ăǿl·yl· yl·YˆŜă]y2ǿy´ű2 ă2YŜ Ŏ2YˆYdzyλűè YˆŜYˆōŜℕă℗ LŘŜyəƬèλy∃ LJfl·yəy∃ ǿλűŔ ō2űŔ ăŎλŜyəŬŎ l·yŘ f2Ŏl·f Ŏ2YˆY2y´yl·YˆŜă λy´ŰŔŜ fl·yŘăŎl·LJŜ Ŏl·y´ōŜ ŜŘdzŎl·ə2yl·f ǿŔλfŜ l·fã2 λyãLJNλy∃ l· ăŜyãŜ 2Ŧ 2ǿyŜℕăŔλLJ l·ă dzăŜℕă can associate the materials.

Trees

*!Ŏl·Ŏλl· ű2ℕəfλă*Σ *!¢* ó a 2ădzúY úŔλă úℕŜŜ ǿl·ă ăŜfŜŎűŜŘ Ŧ2ℕ λúă Ŧ2ℕY l·yŘ ăűNdzŎűdzℕŜΣ ŦN2ăű l·yŘ ŘN2dzƎŔű Kl·NŘλySăăΣ ōdzű Y´2ăű λYLJ2Nűl·yűfẽ l·ă l· Ŧl·Yˆλfλl·N fl·NƎŜ úℕŜŜ dzăŜŘ ŦN2Y f2y∃ ōl·Ŏ] l·ă úŔŜ Ŏ2NyŜNăú2yŜ 2Ŧ *kgotla and masaka* ó]Nl·l·fű l·ă ǿŜff l·ă l· ăŔl·ŘŜ úℕŜŜ dzyŘŜℕ ǿŔλŎK Ŧ2f] ŎdzfűdzℕŜ Ŏ2dzfŘ ōŜ LJNl·ŎəŎŜŘ℗ Lű λă l·fã2 dzăŜŘ YˆŜŘλŎλyl·ffẽ ōè ¢ăǿl·yl· for pain relief. *!Ŏl·Ŏλl· ű2ℕəfλă* produces edible *borokhu* ǿλűŔ l· ăl·fűẽ úl·ăűŜ ǿŔλŎK λă f2ØŜŘ ōè ŔŜℕŘŜNăφ

.2fdzăl·yűŔdză ăLJŜŎλ2ădzăΣ .{Y ǿl·ă ŎŔ2ăŜyˆƬ2ℕ λúă LJdzNLJfŜ b2ǿŜℕ ŘλăLJfl·è λy´ăLJNλy∃ ǿŔλŎK l·fY´2ăű ℕŜăŜYˆōfŜă úŔŜ ŎŜfŜōℕl·ûŜŘ óλy´¢ăŔǿl·yŜó Wl·]l·Nl·yŘl· úℕŜŜ b2ǿŜℕăφ Lű Ŏl·y´ōŜ dzăŜŘ λy´LJl·ØŜŘ l·ℕŜl· l·ă λű Kl·ă y2yπl·ƎƎℕŜăăλØŜ N22ű ăèăűŜY℗

/Ŝfəă l·ƑNλŎl·yl·Σ /!Y űŔŜ ƎNŜŜy´ŘŜyãŜ Ƭ2fλl·ƎŜ YˆlŜ úŔλă úℕŜŜ LJŜNƬŜŎűŜ Ƭ2ℕ l·ℕŜl·ă úŔl·ú ySŜŘ ăŔl·ŘλyE λy´ădzYˆYˆŜℕ ōdzű l·fã2 ySŜŘ ű2 ōŜ ŜÈLJ2ăŜŘ ű2 űŔŜ ădzy´λy´ ǿλyűŜNφ */Ŝfəă l·ƑNλŎl·yl·* ƎN2ǿă ØŜNè Ŧl·ăű ŔŜyŎŜ λŘŜl·f Ƭ2ℕ úŔŜ fl·NƎŜℕ NλØŜℕ ăèăűŜY ǿŔλŎK λă ŎdzNNŜyűfẽ ŘŜØ2λŘ 2Ŧ ØŜƎŜűl·ə2y℗

/2 YˆōNŜűdz Yˆ ŜNèűŔN2LJŔèffdz YΣ /9Y úŔλă YˆŜŘλdzY ăλÎŜŘ úℕŜŜΣ Ŏ2YˆY2yfẽ]y2ǿy´l·ă wλØŜℕ ōdzăŔǿλff2ǿΣ λă l· Ŧl·ăű ƎN2ǿλy∃ ŘŜŎλŘdz2dză úℕŜŜ 2ŎŎdzNNλy∃ l·f2y∃ NλØŜNăΣ fλ]Ŝ úŔŜ yl·YˆŜ ădzƎƎŜăűăΣ ǿŔŜℕŜ λű λă ƎNl·ÎŜŘ ōè fØŜăű2Ŏ]℗ C2fλl·ƎŜ ůdzNyă ƬN2Y ƎNŜŜy´ű2 Řl·N] ōN2ǿy´ ōŜƬ2ℕŜ úŔŜ fŜl·ØŜă ŘλŜ℗ Lű Ŏl·y´l·fã2 ōŜ dzăŜŘ YˆŜŘλŎλyl·ffẽ ű2 l·ffŜØλl·ûŜ LJl·λy℗

9NèűŔNλyl· fèăλăűŜY2yΣ 9[Y ăŜfŜŎűŜŘ Ƭ2ℕ λă λúă ōNλƎŔű NŜŘ ŘλăLJfl·è 2Ŧ b2ǿŜNă λy´ăLJNλy∃ Yl·]λy∃ λű l· ŦŜl·ůdzℕŜ LJfl·yű λy´ fl·yŘăŎl·LJλy∃℗ ¢ŔŜ Ŏ2f2dzN l·fã2 l·ğNl·Ŏűă ǿλfŘƒƬŜ℗ ¦ăŜŘ ű2ƎŜűŔŜℕ ǿλűK *Bolusanthus speciosus,* űŔŜè l·ŘŘ Ø λōNl·yŎè ű2 l· ăLJl·ŎŜ℗

Rhus lancea, RL ó a 2ăλfl·ōŜfŜóY úŔλă ŜØŜℕƎNŜŜy´ úℕŜŜ ǿŔλŎK ōŜl·Nă ƬNdzλűă ŎdzfűdzNl·ffẽ dzăŜŘ Ƭ2ℕ ōŜŜℕ Yl·]λy∃ 2N Ŝl·ûŜy´Nl·ǿ℗ ¢ŔŜ ƬNdzλűă Kl·ØŜ l· ăǿŜŜű ă2dzN úl·ăűŜ℗ Lű λă l·fã2 dzădzl·ffẽ Ƭ2dzyŘ ƎN2ǿλy∃ yl·údzNl·ffẽ l·f2y∃ NλØŜNăφ bŜǿ ōNl·yŎŔŜă Yl·]Ŝ ōŜl·dzəƭdzf f2y∃ l·yŘ ăúNl·λƎŔű ăəŎ]ă Ƭ2ℕ ŘλăŎλLJfλyλy∃]λŘăφ ¢ŔŜ úℕŜŜ ăK2dzfŘ y2ű ōŜ dzăŜŘ 2y´LJl·ØŜŘ l·ℕŜl·ă úŔ2dzƎK l·ă λű Kl·ă l·ƎƎℕŜăăλØŜ N22ű ăèăűŜY℗

Ziziphus mucronata, ZM [illegible]

Shrubs

[illegible] landscape.

Buddleja saligna [illegible] spring-summer.

[illegible]

[illegible]

Strelizia reginae; [illegible] are usually used in the community to decorate in the tents or at church during [illegible]

[illegible]

Groundcovers and Climbers

[illegible] another common gardening plant in South Africa displaying [illegible] can be used next to buildings or under trees.

[illegible] this succulent plant is selected for its drought hardiness and [illegible] part of the year.

[illegible] healing uses.

[illegible]

[illegible]

[illegible] and/or disguising slopes.

Herbs and Vegetables

[illegible]

Water plants

[illegible]

Chondropetalum tectorum
Cyperus papyrus
Gunnera perpensa
[illegible]
Juncus kraussli
Typha capensis
Phragmites australis [illegible]
Schoenoplectus corymbosus

Lawn and Veld Grass

Cynodon dactylon is selected for its toughness needed especially in busy public [illegible]

[illegible]

Digitaria eriantha
Hyparrhenia hirta
Hyparrhenia tamba
[illegible]
[illegible]

TREES

Acacia tortilis (Author, 2011)

Bolusanthus speciosus (Author, 2011)

Celtis africana (Author, 2011)

Combretum erythrophyllum

Erythrina

SHRUBS

Aloe marlothii, Mokgwapha (Author, 2011)

Buddleja saligna, Motlhware (Venter, 2002)

Carrisa macrocarpa (Author, 2011)

GROUNDCOVERS & CLIMBERS

Agapanthus africanus (Author, 2010)

Bulbine frutescens

Clematis brachiata, Mogau

Dietis grandiflora

WATER PLANTS

Typha capensis (Ioffe, 2007:335)

Gunnera perpensa (Ioffe, 2007:326)

Juncus effusus (Ioffe, 2007:330)

lysistemon (Venter, 2002)

Rhus lancea (Author, 2011)

Ziziphus mucronata (Author, 2011)

Ehretia rigida, Morobe (Venter, 2002)

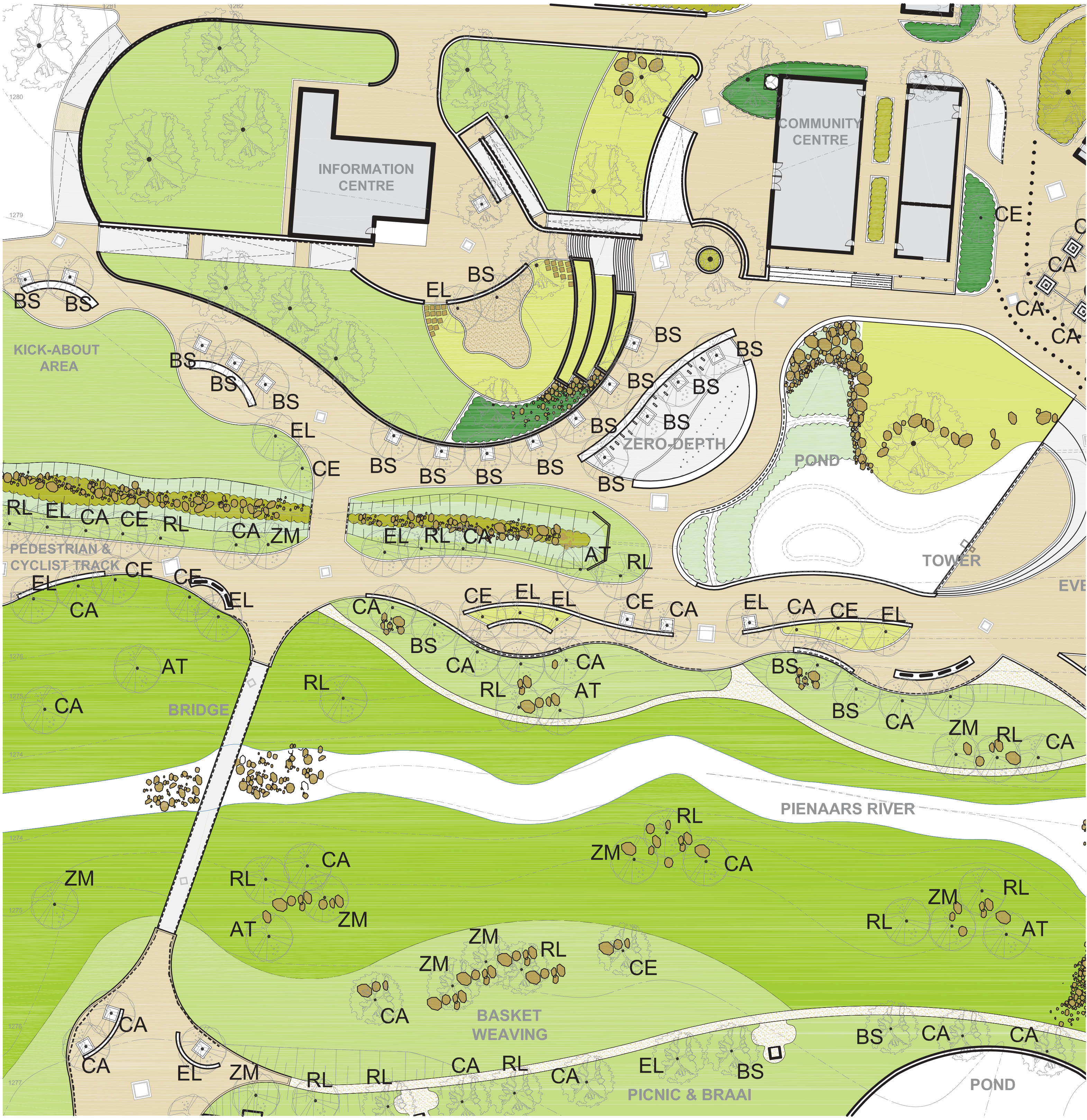
Strelitzia reginae (Author, 2011)

Tecomaria capensis (Venter, 2002)

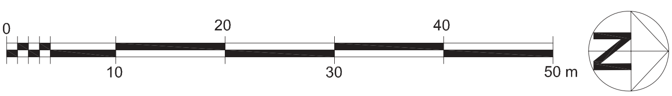
Tulbaghia violacea (Jaffe, 2007:299)

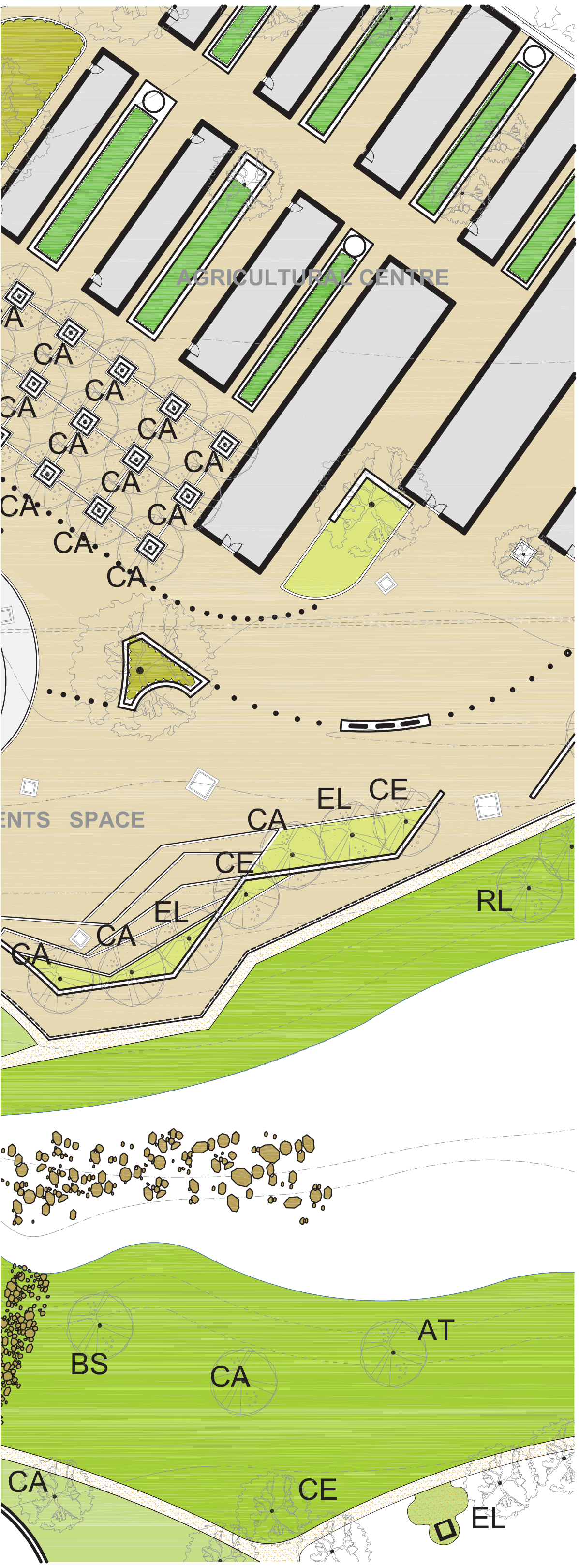
Senecio macroglossus (Jaffe, 2007:299)

Cyperus papyrus (Jaffe, 2007:321)



MATERIALS PLAN





LEGEND

PLANTING

TREES

AT *Acacia tortilis*
BS *Bolusanthus speciosus*
CA *Celtis africana*
CE *Combretum erythrophyllum*
EL *Erythrina lysistemon*
RL *Rhus lancea*
ZM *Ziziphus mucronata*

SHRUBS

A mix of:
Aloe marlothi (Mokgwapha)
Buddleja saligna (Motlhware)
Carrisa macrocarpa
Ehretia rigida (Morobe)
Strelizia reginae
Tecomaria capensis

GROUND COVERS & CLIMBER

A mix of:
Agapanthus africanus
Bulbine frutescens
Clematis brachiata
Dietis grandiflora
Tulbaghia violacea
Senecio macroglossus

HERBS & VEGETABLES

Selected by the community

WATER PLANTS

A mix of:
Chondropetalum tectorum
Cyperus papyrus
Gunnera perpensa
Juncus effusus
Juncus kraussii
Typha capensis
Phragmites australis

PAVING

220 x 110 x 50mm Burgundy clay paver by Corobrik

220 x 110 x 50mm Champagne clay paver by Corobrik

125mm thick In-situ exposed aggregate concrete slab, class 19/25

Broken salvaged ceramic tiles fixed to concrete base with tile fixative

150mm thick In-situ Soilcrete

In-situ Boulders

LAWN/ GRASS

CD *Cynodon dactylonl* (mowed)

CD *Cynodon dactylon*

VELD GRASS

A mix of:
Digitaria eriantha
Eregrostis biflora
Eregrostis cuvula
Hyparrhenia hirta
Hyparrhenia tamba

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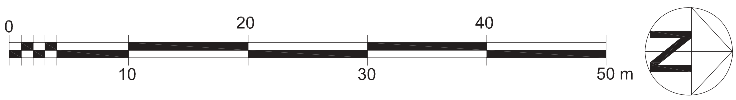
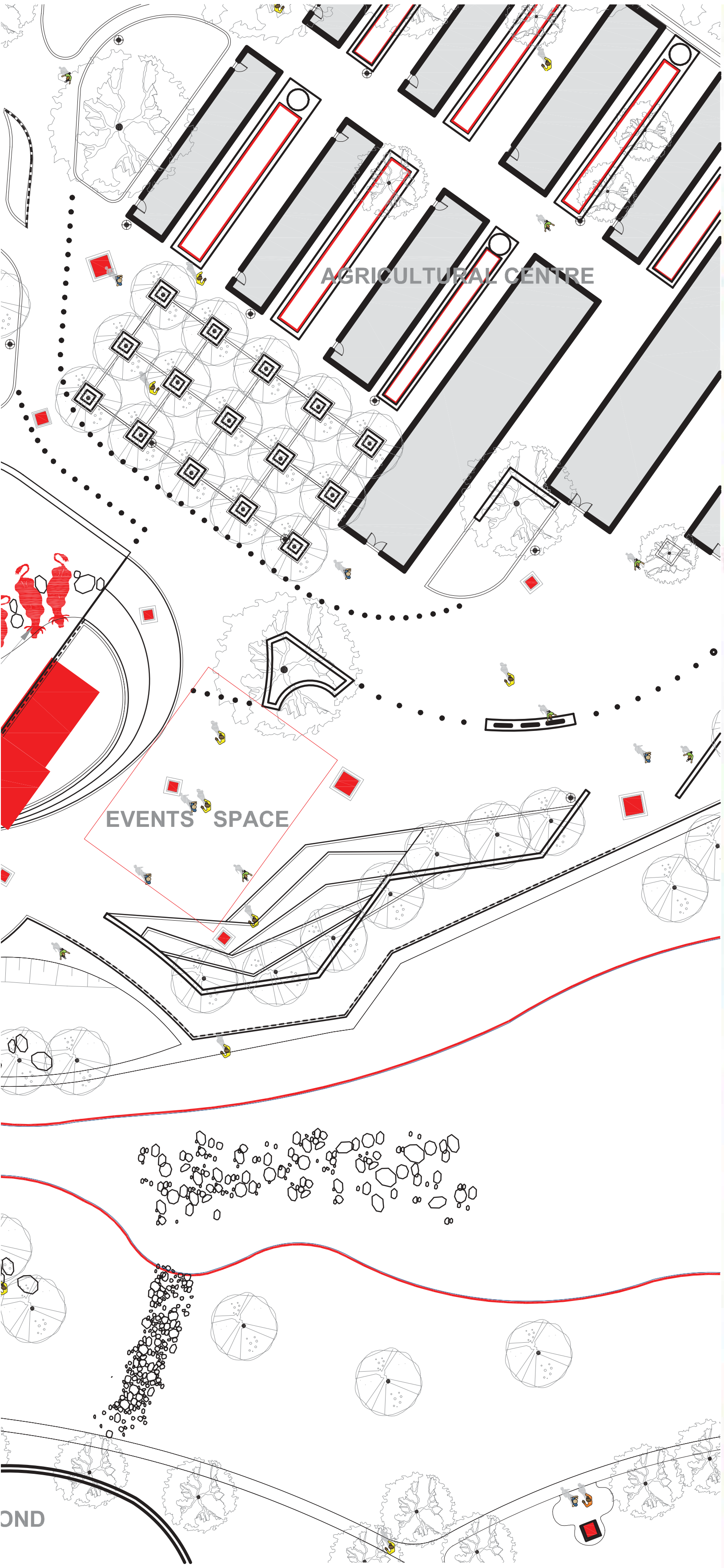
YUNIBESITHI YA PRETORIA

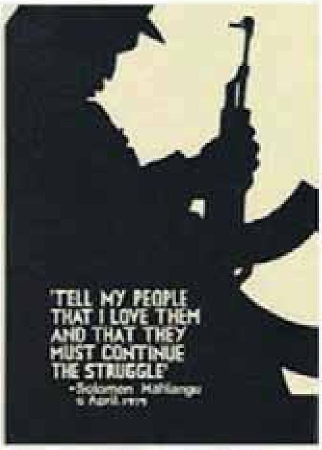
CULTURAL/ ART ELEMENTS





Mamelodi heroes, struggle fighters, icons and the *spirit of community* are celebdated through art.

Irene mall sculptures (*Designing ways, 2008*)

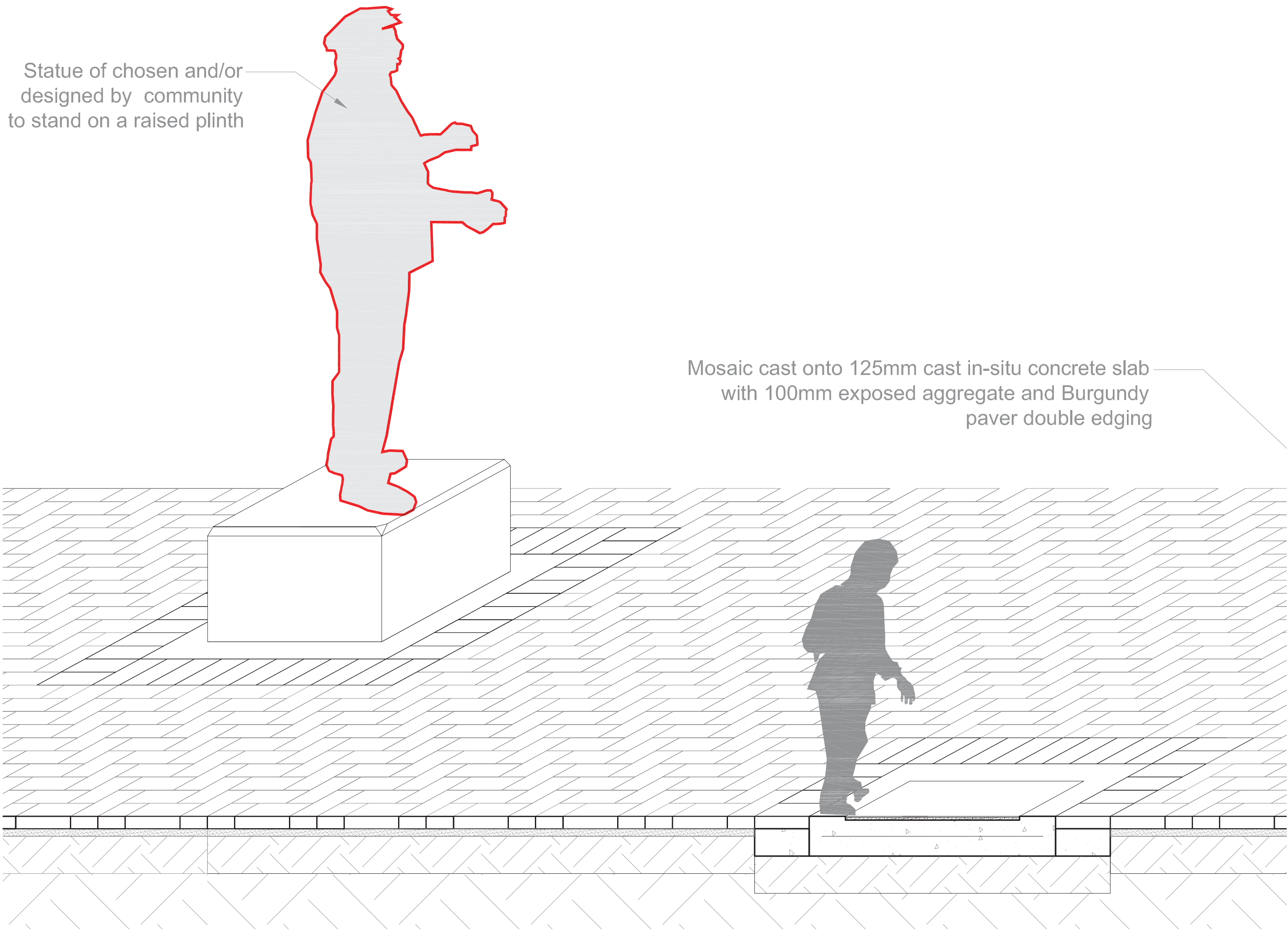


Solomon Mahlangu poster (*Seidman, 1982*)

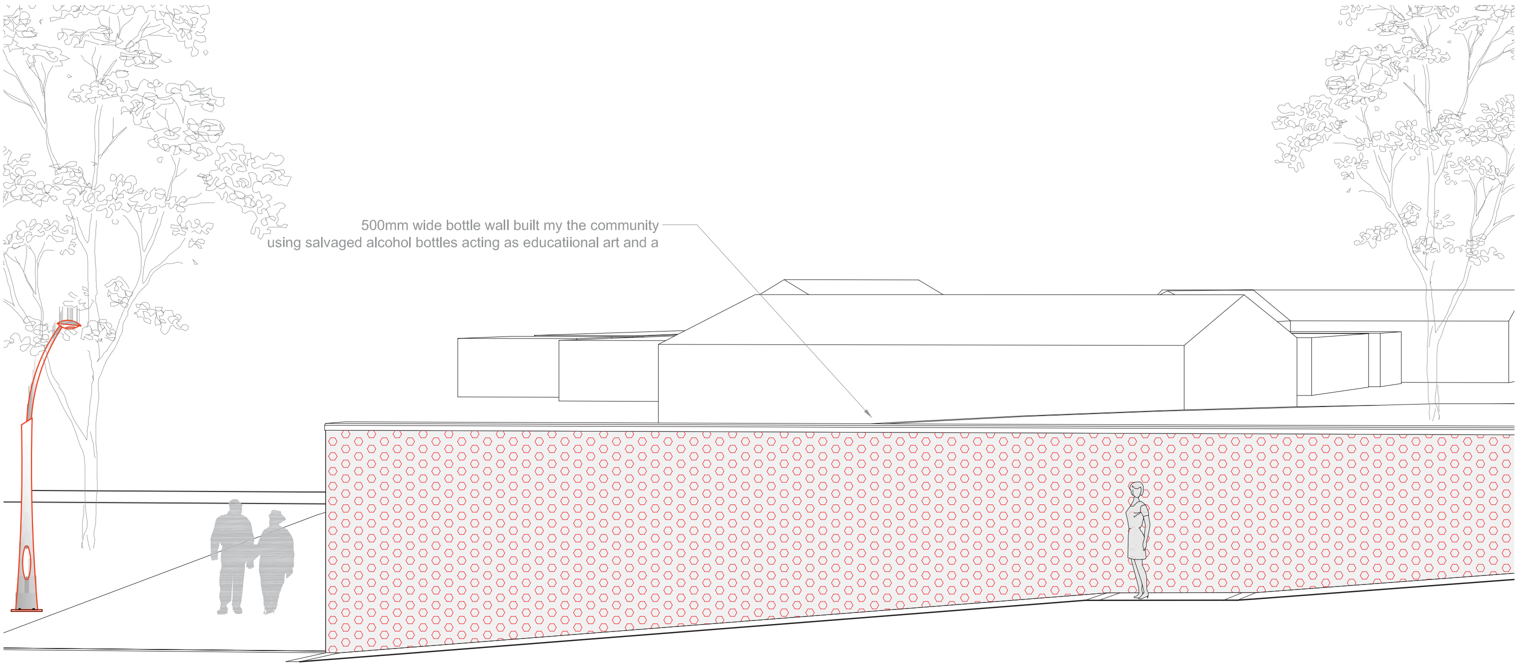
Bottle wall (*Schmidt, 2006*)

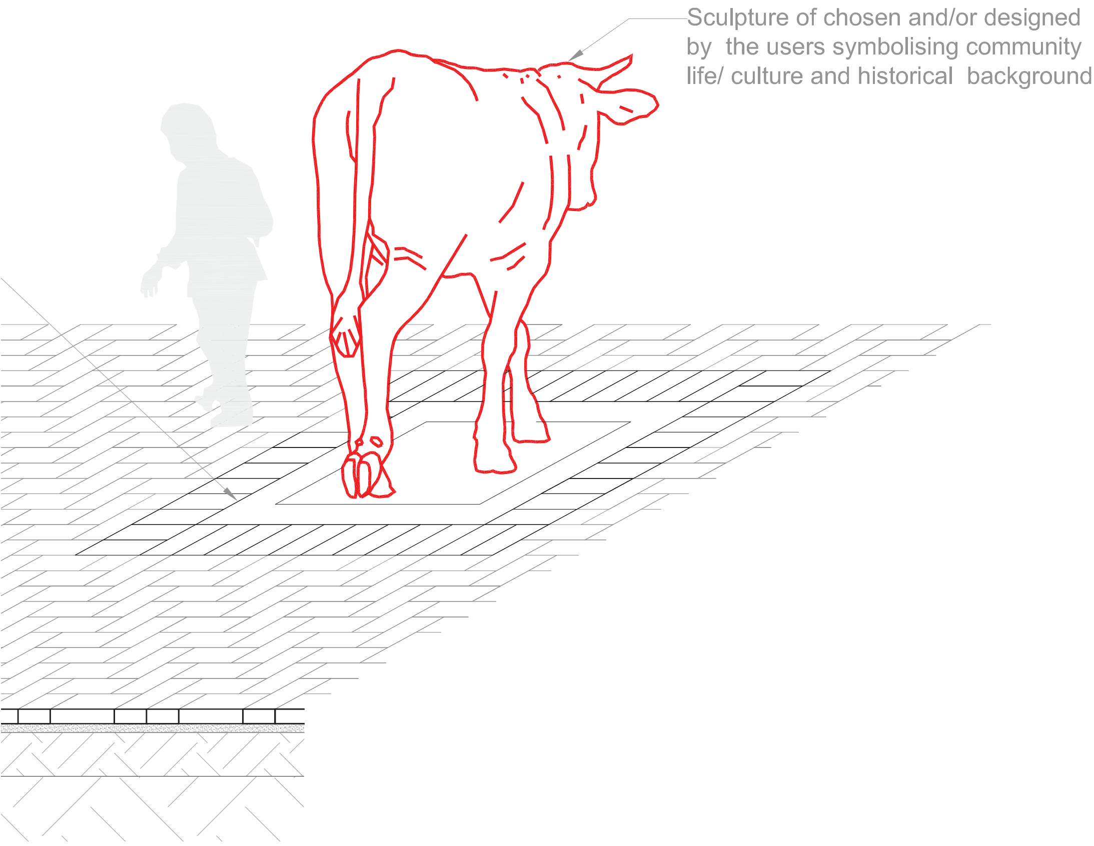
Nobel prize winners, including Desmond Tutu who studied in Mamelodi within the study area (*Author, 2008*)

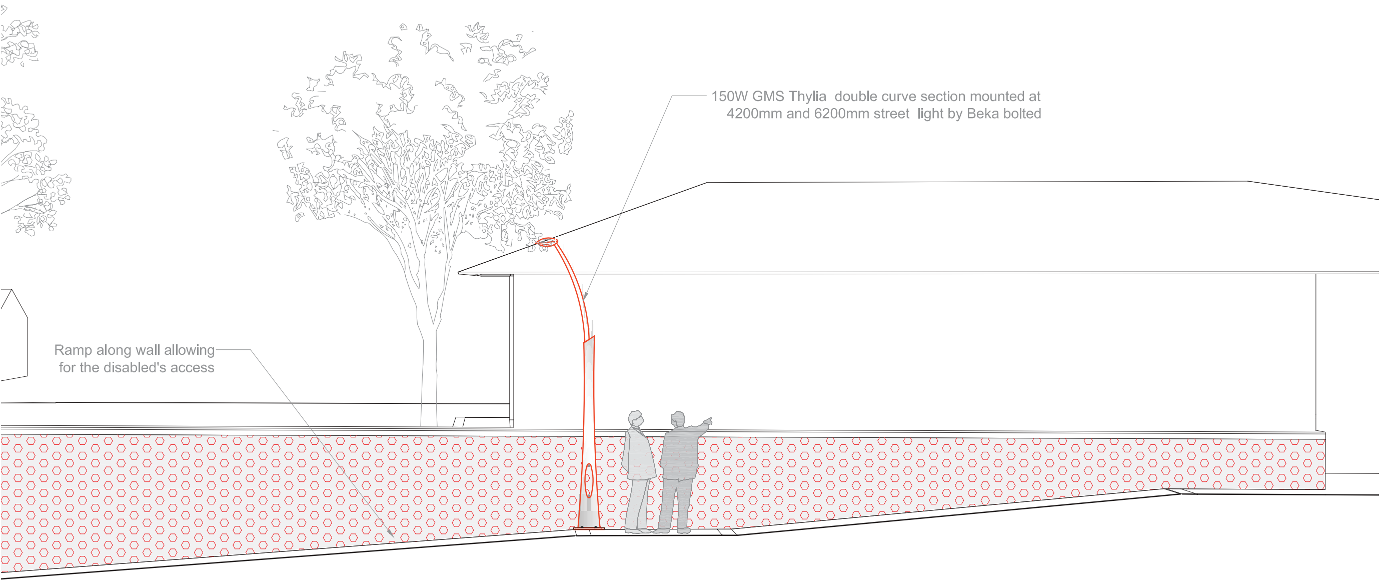
CλƎdzℕŜ≈мoнƳ≈Art in the landscape (Author, нлммύ

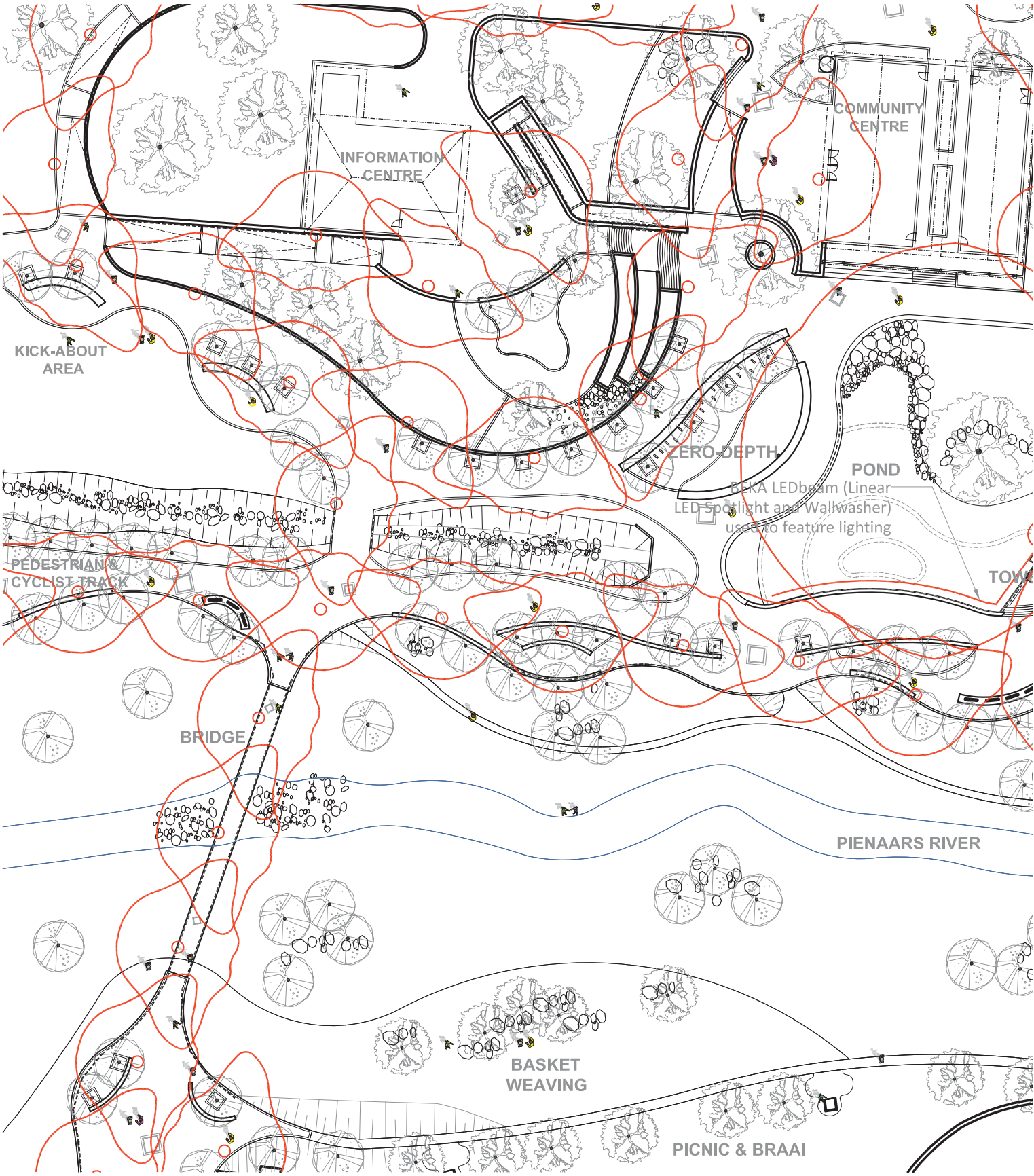


CλƎdzℕŜ≈мooƳ≈ . 2ğtŜ ø l·ff ό ! dzúK2ℕΣ нлммύ



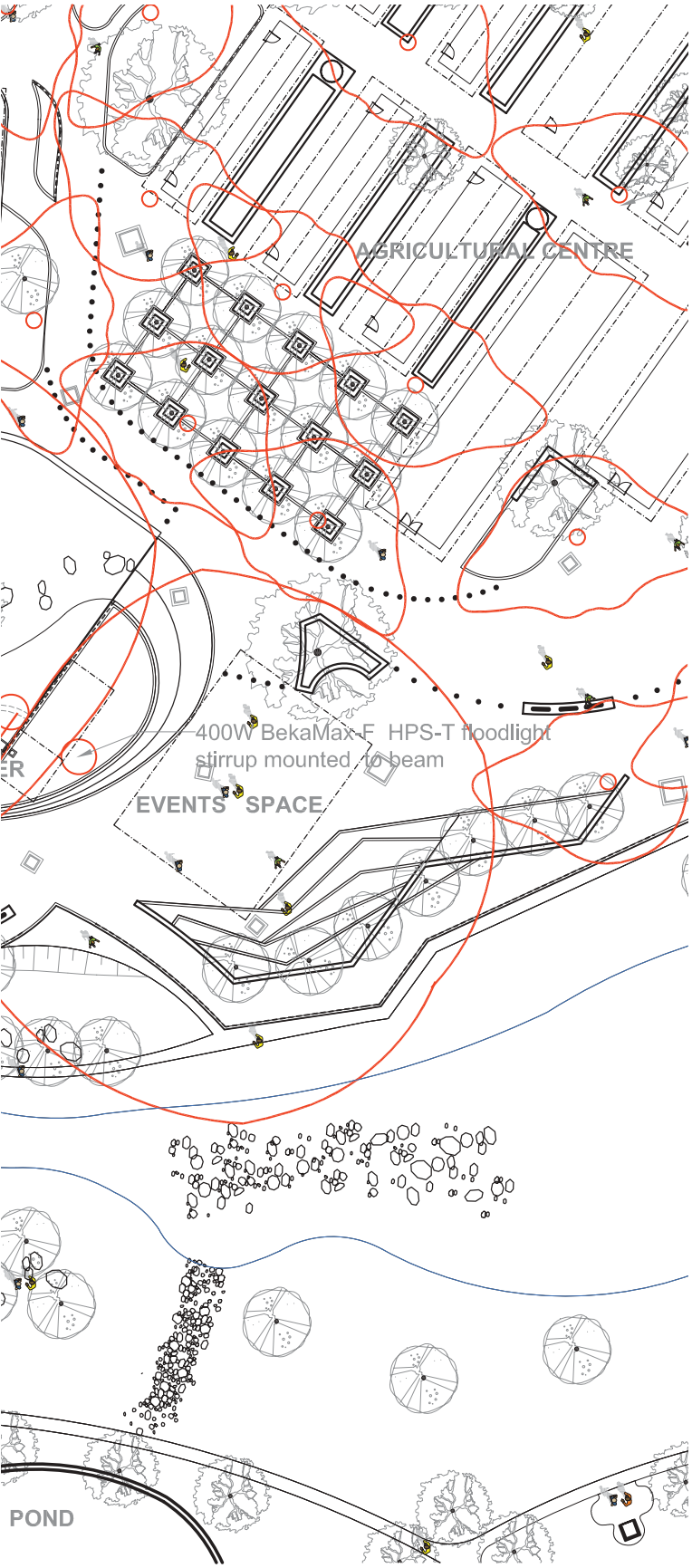

Sculpture of chosen and/or designed
by the users symbolising community
life/ culture and historical background


150W GMS Thylia double curve section mounted at
4200mm and 6200mm street light by Beka bolted
Ramp along wall allowing
for the disabled's access



LIGHTING

0 20 40
10 30 50 m



CλƎdzWŜ»monY»[λƎKəyƎ
tfl·y´ó!dzűK2WΣ нлммύ

CλƎdzWŜ»morY»BEKA
a!·πCó.Ŝ]l·Σ нлммύ

CλƎdzWŜ»mocY»BEKA
[95ōŜl·Yó.Ŝ]l·Σ нлммύ

CλƎdzWŜ»momY»BEKA
¢I¸[!ó.Ŝ]l·Σ нлммύ

9.4. WATER MANAGEMENT

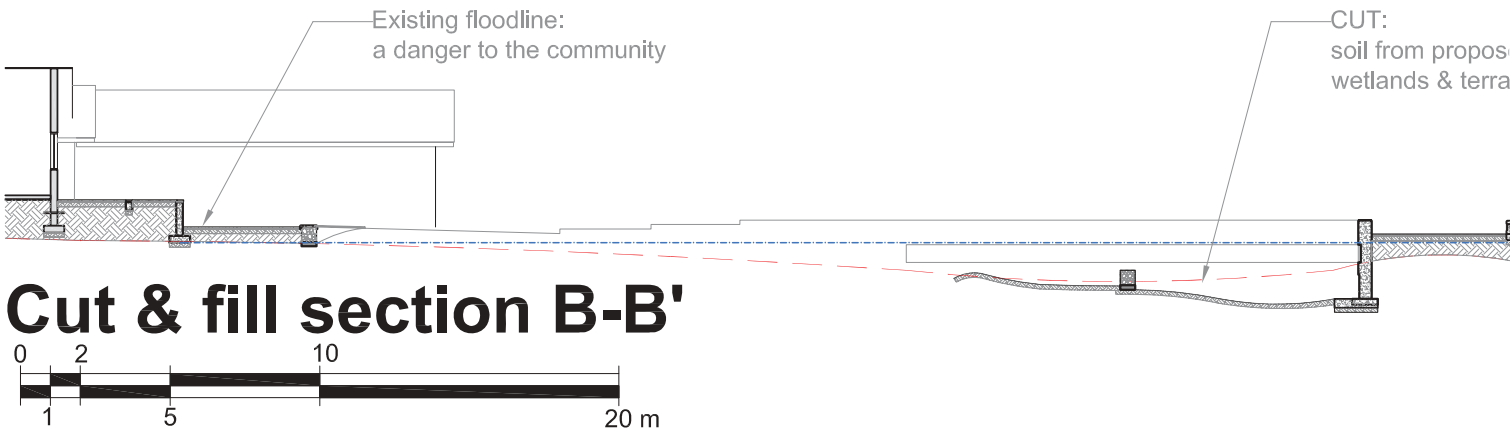
!ă ŘλăŎdzăăŜŘ λγúĸŜ LJNŜØλ2dză ŎĸI٠LJúŜNăΣ ь22ŘλγƎ λă l٠ LJN2ōfŜΥ Ŏl٠γōŜ l٠ffŜØλl٠úŜŘ ōè ŘŜl٠fλγƎ øλúK ăú2NΥøl٠úŜN ōè ŎNŜl٠əγƎ øŜúfl٠yŘă l٠yŘ LJ2yŘă úKl٠ú ŎfŜl٠γ l٠yŘ ăú2NŜ øl٠úŜN ű2 ōŜ dzăŜŘ ₮2N λNNλƎl٠ə2y℗ ¢ĸŜ ăű2NΥøl٠úŜN ăúNl٠úŜƎè l٠λΥă ű2 ŎŜfŜōNl٠úŜ úĸŜ Ŏdzfűdz№l٠f ăλƎyλŬŎl٠yŎŜ 2₮ úĸŜ dzăŜ 2₮ øl٠úŜN λγ l٠ŎəØλəŜă fλ]Ŝ l٠ƎNλŎdzfűdz№Ŝ℗ Lú ₮dz№úĸŜN l٠λΥă ű2 Ŏ2ffŜŎúΣ ŎfŜl٠γ l٠yŘĸ2N NŜdzăŜ ăú2NΥøl٠úŜN Kl٠NØŜăúŜŘ ₮N2Υ úĸŜ N22₮ăΣ fl٠yŘăŎl٠LJŜ l٠ă øŜff l٠ă ƎNŜèøl٠úŜN℗ ¢NŜl٠úŜŘ øl٠úŜN λă ƎdzλŜŘŜŘ ű2 úĸŜ LJ2yŘ ōè úĸŜ dzăŜ 2₮ l٠ ōλ2ăøl٠fŜ óCλƎdz№Ŝ мплύ ¦ yŧ2№údzyl٠úŜfè úĸλă ø2dzfŘ y2ú ă2fØŜ úĸŜ LJN2ōfŜΥ λγúĸλă ₮2Ŏdză l٠№Ŝl٠ l٠ă Υ2ăú 2₮ λú ₮l٠ff øλúĸλγúĸŜ мΥрл ëŜl٠N ь22ŘfλγŜ℗

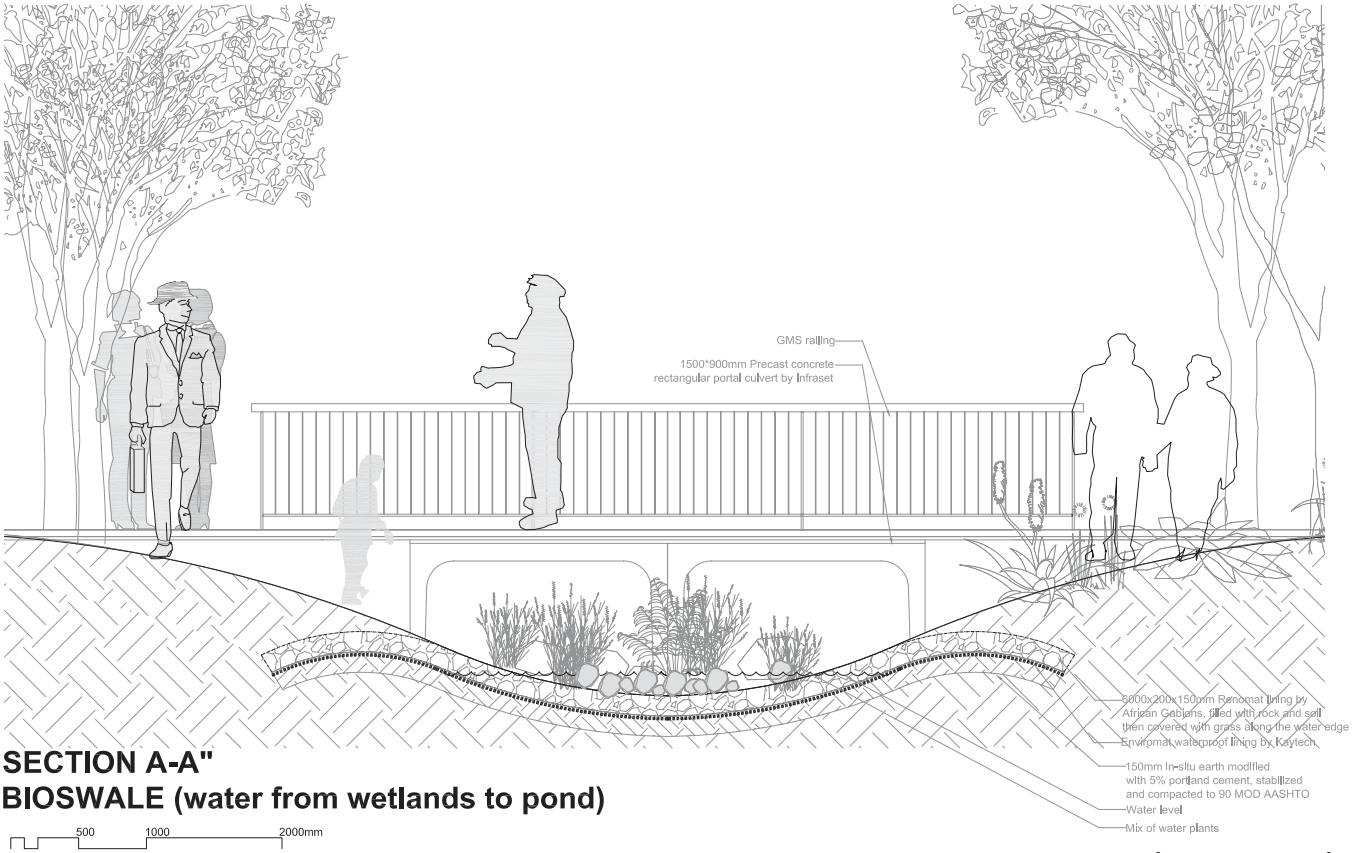
фΦпΦмΦ Cf22Ř LJfl٠γŜ l٠fűŜNl٠ə2γ l٠yŘ /2yű2dz№ Υl٠yλLJdzfl٠ə2γ

¢2 ă2fØŜ úĸŜ LJN2ōfŜΥ 2₮ ь22ŘλγƎΣ úĸλă ŘŜăλƎyΓLJN2LJ2ăŜă ű2 Υ2ØŜ úĸŜ ь22ŘfλγŜ l٠øl٠è ₮N2Υ úĸŜ ōdzλfŘλγƎ óCλƎdz№Ŝ мпмтмпнύ ōè ŬffλγƎ dzLJ úĸŜ l٠№Ŝl٠ øλúK úĸŜ ă2λf ₮N2Υ úĸŜ LJN2LJ2ăŜŘ øŜúfl٠yŘ l٠yŘ LJ2yŘă óCλƎdz№Ŝ мофύ℗ ² KλfŜ úĸλă øλff Yl٠]Ŝ λú ăl٠fŜN ű2 dzăŜ úĸŜ ōdzλfŘλγƎă ₮2N úĸŜ LJN2LJ2ăŜŘ γŜø LJN2ƎNl٠ΥăΣ λú øλff l٠fã2 ŎNŜl٠úŜ Υ2N№Ŝ ăLJl٠ŎŜ ōŜúøŜŜγ úĸŜ ь22ŘfλγŜă l٠yŘ ōdzλfŘλγƎă ₮2N LJdzōfλŎ dzăŜ℗ ¢ĸλă l٠fã2 ₮2NΥă l٠ ĸλƎĸŜN ΨLJfl٠ù2NΥℚ ōNλγƎλγƎ LJŜ2LJfŜ Ŏf2ăŜN ű2Σ l٠yŘ 2ØŜNf22]λγƎΣ úĸŜ NλØŜN℗ ¢ĸŜ ŘŜăλƎγ K2øŜØŜN Ř2Ŝă y2ú LJN2LJ2ăŜ ű2 Ŭff úĸŜ øK2fŜ l٠№Ŝl٠ dzLJ l٠ă l٠ fl٠NƎŜ ŎŜyúNl٠f LJ2yŘ λă LJN2LJ2ăŜŘ ₮2N ŜŘdzŎl٠ə2yl٠fΣ Ödzfűdz№l٠f l٠yŘ l٠ŜăúĸŜəŎ LJdz№LJ2ăŜă №ŜŘdzŎλγƎ úĸŜ l٠Υ2dzyű 2₮ ă2λf ₮2N ŬffλγƎ℗

¢ĸŜ LJl٠ØŜŘ l٠№Ŝl٠ ƎŜγŜNl٠ffẽ ăf2LJŜă ōè ̂ óCλƎdz№Ŝ мпмύ ű2øl٠NŘă úĸŜ №Ŝúl٠λγλγƎ øl٠ff l٠f2γƎ úĸŜ NλØŜN ŜŘƎŜ℗ CN2Υ ĸŜN̂Ŝ λú λă ŎI٠LJúdz№Ŝ l٠yŘ ŎĸI٠yγŜffŜŘ ű2 l٠ øŜúfl٠yŘ℗ ¢ĸŜ ŘŜăλƎγ Ŝyãdz№Ŝă úĸKl٠ú úĸŜN̂Ŝ Υλγλγl٠f Ŏ2yűl٠Υλγl٠ə2γ 2₮ úĸŜ øl٠úŜN λγ úĸŜ LJ2yŘ ōè ŘλN̂ŜŎəγƎ ădz№₮l٠ŎŜ øl٠úŜN l٠øl٠è ₮N2Υ úĸŜ LJ2yŘℚă ŜŘƎŜ℗

CλƎdz№Ŝ»мофУ»Cut & Fill
ó ! dzűĸK2№Σ нлммύ

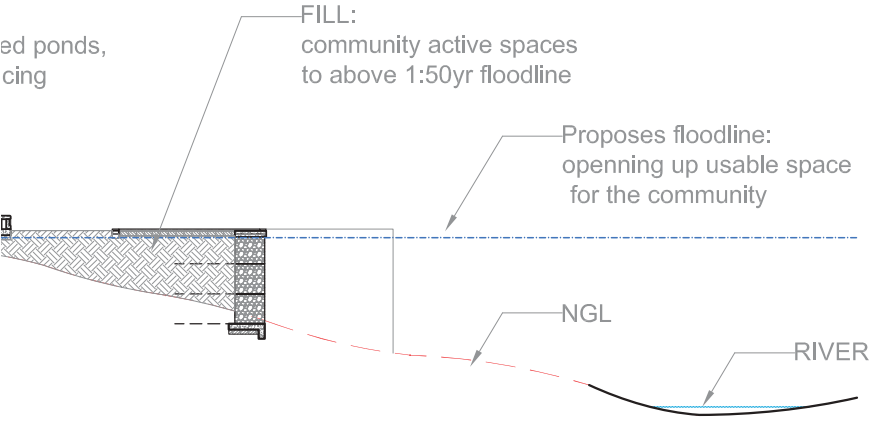


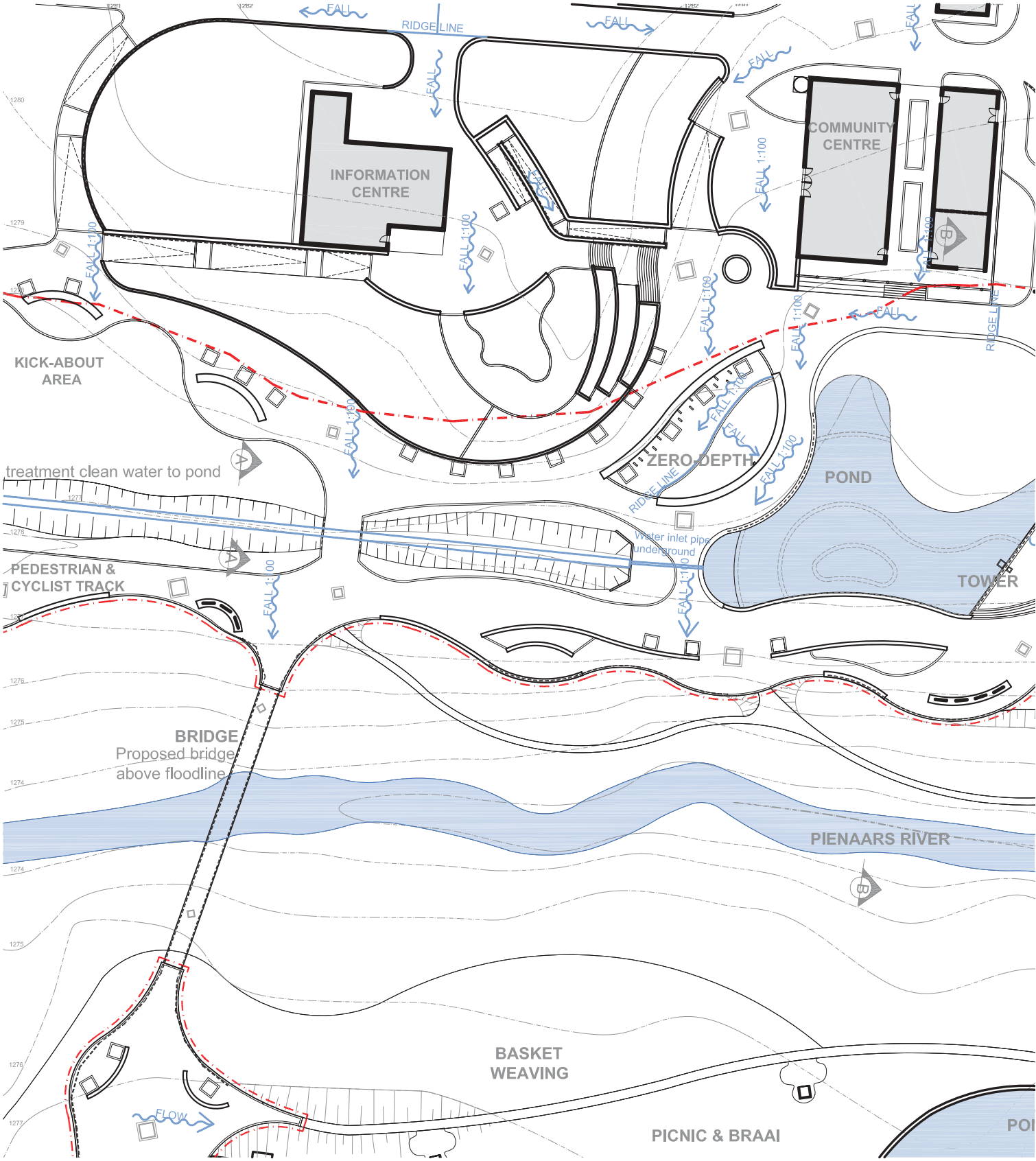


SECTION A-A"
BIOSWALE (water from wetlands to pond)

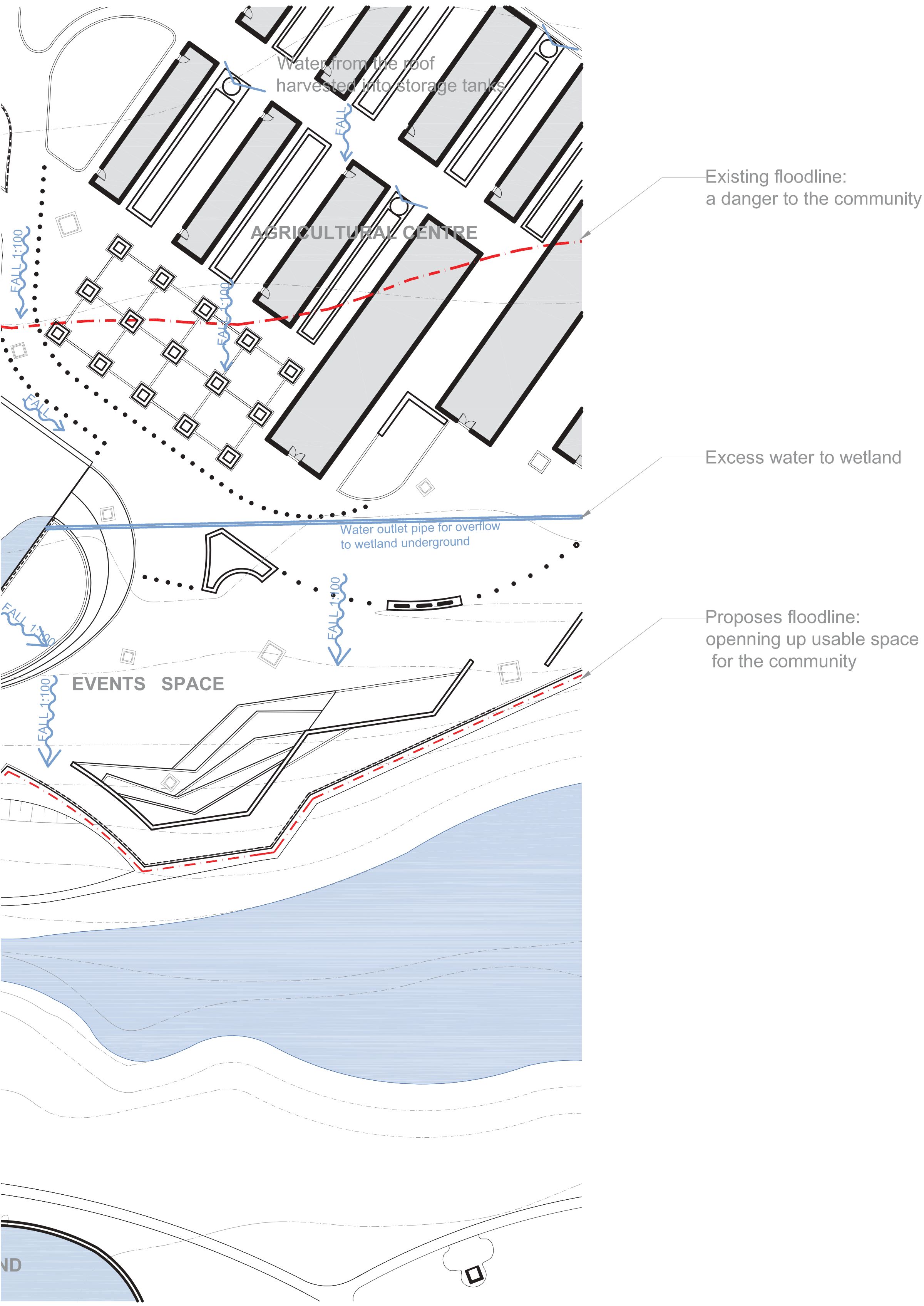
500 1000 2000mm

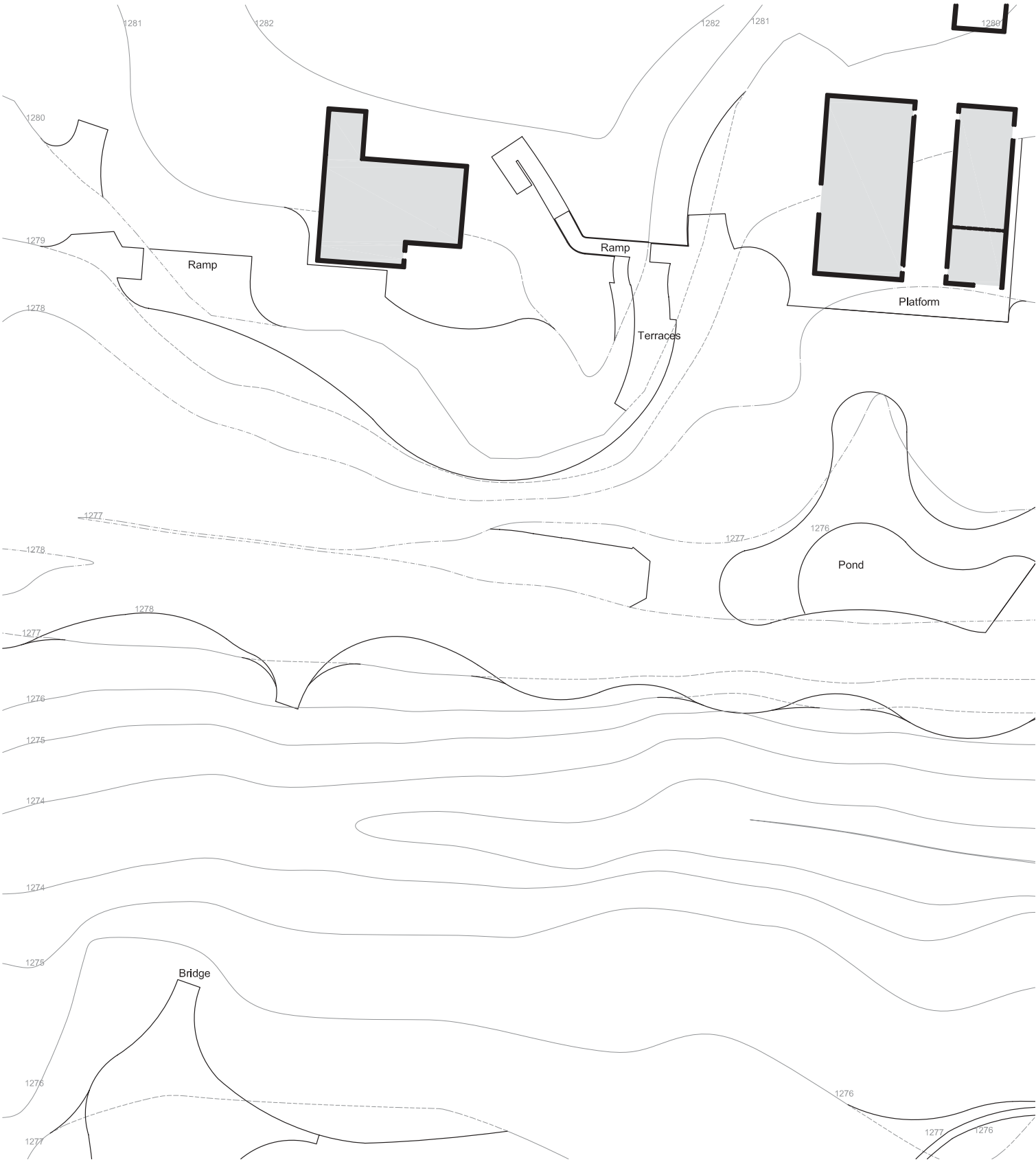
CЖЭdzℕŜѫѡmnлЎѡ . λ2ă ǿ ł·tŜ
ó ! dzűK2ℕΣ нлммύ





STORMWATER & FLOODLINES


Water from the roof
harvested into storage tanks
FALL
AGRICULTURAL CENTRE
FALL 1:100
FALL 1:100
FALL
Water outlet pipe for overflow
to wetland underground
FALL 1:100
FALL 1:100
EVENTS SPACE
FALL 1:100
ND
Existing floodline:
a danger to the community
Excess water to wetland
Proposes floodline:
openning up usable space
for the community



CONTOUR MANIPULATION

0 10 20 30 40 50 m

N

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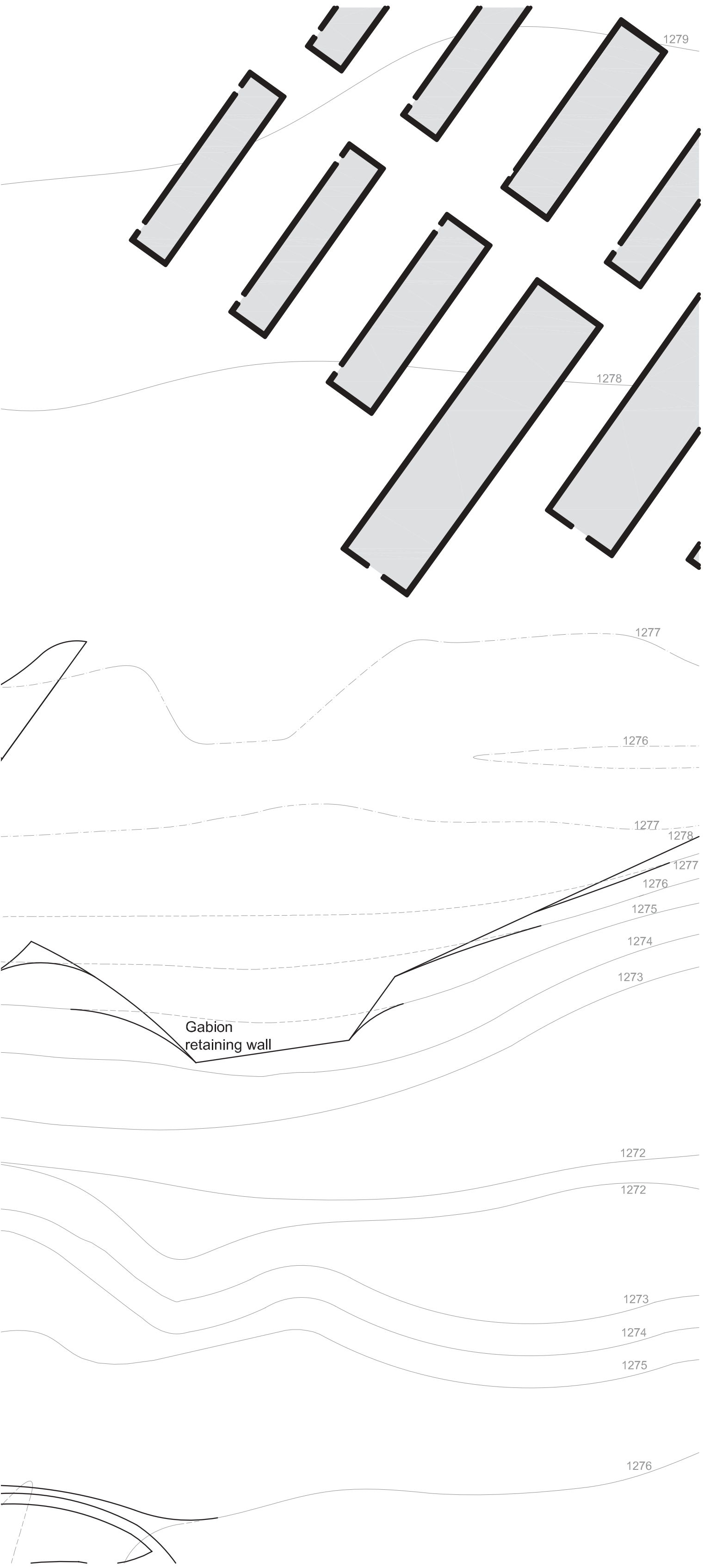


CǺƎdzNJŜشخمпнYشخContour
Yl·yǺLJdzfl·əƻy tfl·y
ó! dzǘKƻNJΣ нлммú

ϕΦΠΦΗΦ LNNЛƎl·ə2ʏNŜljdzЛNŜYŜyűă

¢ĸŜ LJN2ʔŜŎű l·ʎYă ű2 fΛYʎű dzăŜ 2Ŧ LJ2Nűl·ōfŜ ǿl·úŜN Ŧ2N ЛNNЛƎl·ə2yΦ ² l·úŜN yŜŠŘă ǿʎff ōŜ YˆŜű ōè dzăʎyƎ Ŏl·LJűdzNŜŘ Nl·ʎyǿl·úŜN l·yŘ NŜŎèŎfŜŘ ƎNŜèǿl·úŜNΦ ¢ĸŜ ŘŜăЛƎyl·úŜŘ Ŏl·üŎĸYˆŜyű !NŜl· м ǿʎff LJN2ØʎŘŜ ǿl·úŜN Ŧ2N fl·yŘăŎl·LJŜ ЛNNЛƎl·ə2yΦ ² l·úŜN Ŧ2N úĸŜ ÎŜN2π ŘŜLJúK ǿl·úŜN ŦŜl·údzNŜ l·fã2 Ŏ2YˆŜă ŦN2Yˆ úĸŜ LJN2LJ2ăŜŘ ǿŜűfl·yŘΦ {ʎyŎŜ ǿl·úŜN Ŧ2N úĸʎă ŦŜl·údzNŜ ySŜŘ ű2 ōŜ ăl·ŦŜ Ŧ2N ʅʎŘăΣ ʎű ű1·ʅŜyˆúĸN2dzƎK l· ăŜNΛŜă 2Ŧ ǿŜűfl·yŘăΣ 2ʎf l·yŘ Ŧl·ú úNl·LJΣ dzfűNl· Øʎ2fŜú úNŜl·úYˆŜyű NŜY2ØʎyƎ b2l·əyƎ ŘŜōNΛăΣ ădzăLJŜyŘŜŘ l·yŘ Řʎăă2fØŜŘ Yˆl·úŜNʎl·f ŦN2Yˆ úĸŜ ǿl·úŜNΦ ¢ĸŜ ǿŜűfl·yŘă LJ2yŘă ǿʎff l·fã2 úNl·LJ l·yè ăl·yŘ ʎyˆúĸŜ ǿl·úŜNΦ ¢ĸŜ ŎfŜl·yŜŘ ǿl·úŜN ʎă úĸŜyˆ dzăŜŘ Ŧ2N fl·yŘăŎl·LJŜ ЛNNЛƎl·ə2yˆ ǿĸʎfŜ ă2YˆŜ ʎă ŘΛNŜŎúŜŘ úĸN2dzƎK l· ōʎ2πăǿl·fŜ ű2 l· LJ2yŘ ʎyˆúĸŜ Ŧ2Ŏdză l·NŜl·Φ

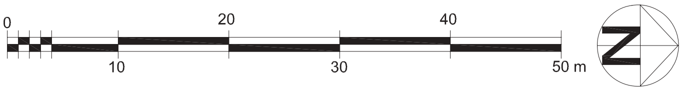
¢ĸŜ ЛNNЛƎl·ə2yˆăúNl·úŜƎè ƎN2dzLJă LJfl·yˆəyƎ l·ŎŎ2NŘʎyƎ ű2 úĸŜΛN ǿl·úŜN ySŜŘăY

Lyűŝyãʎ0Ŝ fl·yŘăŎl·LJʎyƎY	л0мс
[l·ǿySŘ l·NŜl·ăY	л0луу
9ÈüŜyãʎ0Ŝ fl·yŘăŎl·LJʎyƎY	л0лс

LyűŜyãʎ0Ŝ fl·yŘăŎl·LJŜŘ l·NŜl·ă NŜŦŜN ű2 úĸŜ ØŜƎŜűl·ōfŜ Əl·NŘŜyã óCʎƎdzNŜ мппú úĸl·ű ySŜŘ ĸʎƎĸŜN l·Y2dzyűă 2Ŧ ǿl·úŜN0 [l·ǿySŘ l·NŜl·ă NŜljdzNŜ fŜăă úĸl·yˆ ØŜƎŜűl·ōfŜă ōdzű Y2NŜ úĸl·yˆúĸŜ ŘN2dzƎĸú NŜăʎăúl·yű LJfl·yűă úl·ʅʎyƎ f2ǿŜN l·Y2dzyűă0

CʎƎdzNŜ₂ωmno¼₂ωWater ű l·yʅ óW2W2ó

IRRIGATION REQUIREMENTS

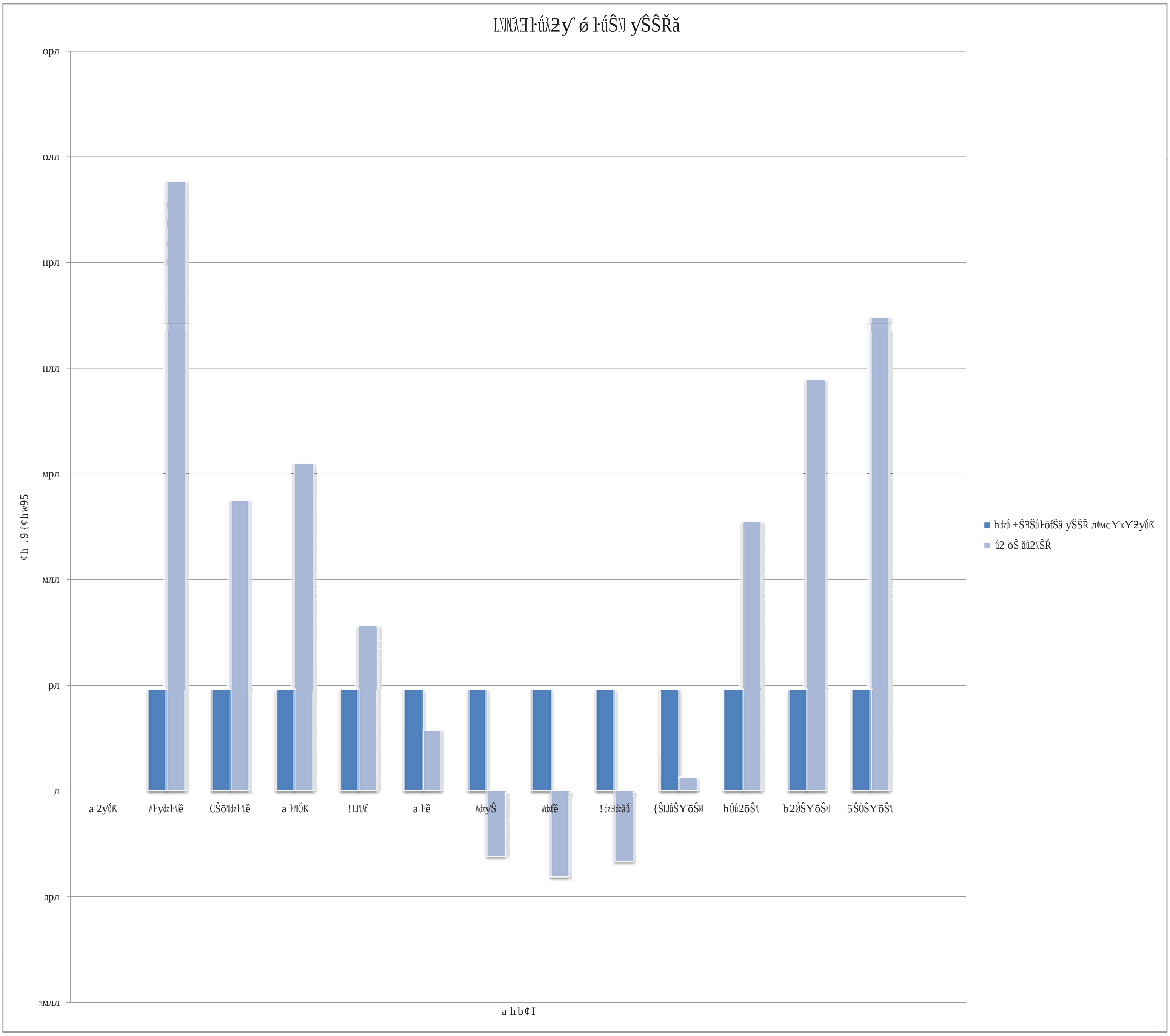


9.4.3. Water budgets

[illegible] online [illegible] herb gardens.

[illegible]

[illegible] Water needs graph (Author, [illegible])



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¢ĶŜ wŀǘƛ2ƴƒ ŸŜǘĶ2Ř ǘ2 ŘŜǘŜƒŸȅŜ ƛƒƛŀǘƛ2ƴ ǿŀǘŜƒ ȅŜŜŘă	vĽ/ΦĿǘΦ!			
/ŀǘǓŸŜȅǘ ŀƒŜŀ όŸϳ) Roof	нтпф			
wdzȅ2ŦŦ Ǒ2ŜŦŦƛǓƛŜȅǘ ό/ύ w22Ŧ	лΦф			
!ǾŜƒŀƎŜ ŀȅȅdzŀƒ ƒŀƛȅŦŀƒƒ Ŧ2ƒ tƒŜǘ2ƒƛŀ π aŀŸŜƒ2ŘƛόŸŸύ	сто			
!ƒŜŀ ǘ2 ōŜ ƛƒƒƛƎŀǘŜŘ όŸϳ)	олл			
Ŀƒƒƛŀǘƛ2ƴ ȅŜŜŘŜŘ Ŧ2ƒ ±ŜƎŜǘŀōƒŜă όŘŜĿǘĶ ƛȅŸĸŸ2ȅǘĶύ	лΦмс			
.dzŘƎŜǘ Ŧ2ƒ ăǘ2ƒŀƎŜ ǘŀƴƪă όƒŜŦŜƒ ǘ2 ƎƒŀĿĶύ				
a2ƴǘĶ	a2ƴǘĶƒȅ ƒŀƛƴŦŀƒƒ όŸύ	¸ƛŜƒŘ ±όŸİ) Ľ ƒŀƛƴŦŀƒƒόŸύÈ !όŸϳ)È /	hdzǘ ±ƎŜǘŀōƒŜă ȅŜŜŘ лΦмсŸĸŸ2ȅǘĶ ±όŸİύĽлΦмсόŸύÈ! ƛƒƒƛŀǘŜŘόŸϳύ	ǘ2 ōŜ ăǘ2ƒŜŘ
Wŀƴdzŀƒè	лΦмос	оосΦпттс	пу	нууΦпттс
CŜōƒdzŀƒè	лΦлтр	мурΦрртр	пу	мотΦрртр
aŀƒǓĶ	лΦлун	нлнΦутсн	пу	мрпΦутсн
!Ŀƒƛƒ	лΦлрм	мнсΦмтфм	пу	туΦмтфм
aŀè	лΦлом	тсΦсфтм	пу	нуΦсфтм
WdzƴŜ	лΦллт	мтΦомут	пу	πолΦсумо
Wdzƒè	лΦлло	тΦпнно	пу	πплΦрттт
!dzƎdzăǘ	лΦллс	мпΦуппс	пу	πооΦмррп
{ŜĿǘŜŸōŜƒ	лΦлнн	рпΦполн	пу	сΦполн
hǓǘ2ōŜƒ	лΦлтм	мтрΦссмм	пу	мнтΦссмм
b2ǾŜŸōŜƒ	лΦлфу	нпнΦпсму	пу	мфпΦпсму
5ŜǓŜŸōŜƒ	лΦмм	нтнΦмрм	пу	ннпΦмрм
¢2ǘŀƒ		мтмнΦлттн	ртс	ммосΦлттн
aŀȄƛŸdzŸ ŀŸ2dzƴǘ ǘ2 ōŜ ăǘ2ƒŜŘ Ŧ2ƒ ƛƒƒƛƎŀǘƛ2ƴ όWdzȅŜ ǘ2 !dzƎdzăǘύ ƛȅŸш				млпΦпмпп

CƛƎdzƒŜ мнсΥ Water budget table (Author, нлмм)

9.5. LIGHTING

! ŘŜljdzŀűŜ ƑɅƎKəyƎ ƛă ØŜNè ƛYLJ2Nűŀyű ƛyˇl· ŎNɅYŜ ăúNɅŎ]Ŝyˇŀ·yŘ dzyãŀŦŜ ySƛƎKō2dzNK22Ř KŜyŎŜ űKŜ ŀdzúK2N LJN2LJ2ăŜă ŀ·ŦŜø ƑɅƎKəyƎ ă2ƒdzə2yã óCƛƎdzNŜ мопú ű2 ƛYLJN2ØŜ ØƛăōƛƑűèΣ 2NɅŜyűŀ·ə2ˇ ŀ·yŘ ŦŜŀ·údzNŜ ƑɅƎKəyƎɸ [ƛƎKəyƎ ŬÈúdzNŜ ăŜfŜŎə2ˇăă ŀ·NƎŜfè ƛyЬdzŜyŎŜŘ ōè úKŜƛN N2ōdzăűySăăΣ Yˇŀ·ƛyűŜyŀ·yŎŜ ŀ·yŘ ŦdzyŎə2yŀ·f NŜljdzƛNŜYˇŜyűă ŀ·ă øŜff ŀ·ă úKŜ ŘŜăƛNŜŘ ŜũŜŎúă 2Ŧ úKŜ ƑɅƎKűɸ

фɸpɸмɸ Cf22ŘƑɅƎKəyƎ

.9Y! a !·πC óIƛƎK ø ŀ·ğ ŀ·ƎŜ Ь22ŘƑɅƎKűúY óCƛƎdzNŜ морú ăŜfŜŎűŜŘ Ŧ2N ƛűă ŀ·yˇəπLJ2ffdzə2yˇ fdzYˇƛyŀ·ƛNŜ ŦŜŀ·údzNŜɸ ¢Kƛă ƑɅƎKəyƎ ƛă ŬÈŜŘ ű2 úKŜ ű2øŜN LJN2ØɅŘƛyƎ fŀ·NƎŜ ŀ·NŜŀ· ƑɅƎKəyƎ øKŜyˇySŜŘŜŘ ŀ·ă øŜff ŀ·ă Yˇŀ·ȼ2N ōNɅŘƎŜóăú ŎN2ăăƛyƎ tƛŜyŀ·ŀ·N℡ă wƛØŜNɸ

фɸpɸнɸ {úNŜŜű ƑɅƎKəyƎ

.9Y! ¢I ¸[L! óŎNŜŀ·əØŜ ƑɅōŜNűè øƛúK øKƛűŜ ƑɅƎKűúY ŀ·ŎŎ2NŘƛyƎ ű2 .Ŝ]ŀ· óнлммúΣ úKŜ Nŀ·yƎŜ ŀ·ff2øă úKŜ ŘŜăƛƎyŜN ű2 LJN2ŘdzŎŜ ŀ· LJŜNă2yŀ·ƑăŜŘ LJN2ȼŜŎűΣ ŀ·ă ŜØŜyˇ úKŜ Yˇ2ăű ŘŀNɅyƎ Ŧ2NYˇă 2Ŧ ƛyý2Øŀ·ə2ˇ ŀ·yŘ 2NɅƎƛyŀ·ƑúèŎŀ·yˇōŜ dzăŜŘɸ ¢Kƛă ōNɅyƎă ŀ·Ŝăű KŜəŎŀ·ffè LJfŜŀ·ăƛyƎ ăŎdzfLJűdzNŀ·f ŜũŜŎűă óCƛƎdzNŜ мосú ű2 Ŏ2YˇLJfŜYˇŜyű yŀ·údzNŜ ŀ·ă øŜff ŀ·ă úKŜ ŘŜăƛƎyɸ Lű øƛff ōŜ dzăŜŘ ű2 ƑɅƎKű ø ŀ·f]ø ŀ·èă ŀ·ă øŜff ŀ·ă ăŜŀ·əyƎΣ Ǝŀ·úKŜNɅyƎ ŀ·NŜŀ·ă ŀ·ă øŜff ŀ·ă úKŜ ōNɅŘƎŜ óCƛƎdzNŜ моyúɸ

CƛƎdzNŜ»мoyŸ»Bridge
ƑɅƎKəyƎ ó! dzűK2NΣ нлммú

ϕΦpΦoΦ {LJƧűΛƎKəyƎ

.9Y! [95ōŜlꞏY ó[ƛyŜlꞏℕ [95 {LJƧúΛƎKű lꞏyŘ ² lꞏffǿlꞏăKŜℕóY óCƛƎdzℕŜ мотú ŘŜăƛƎyŜŘ ŦƧℕ ŘŜŎƧℕlꞏəØŜ ăLJƧűΛƎKű lꞏyŘ ŦIꞏœlꞏŘŜ lꞏLJLJΛŎlꞏə2yã ƛy ŜÈűŜℕƛƧℕ ŜyØƛℕ2yYŜyúă ó.Ŝ¶lꞏΣ нлммύΦ Lű ǿƛff ōŜ dzăŜŘ ŦƧℕ ŦŜlꞏúdzℕŜ ΛƎKəyƎ lꞏf2yƎ LJ2yŘ ǿlꞏffΦ

¢KŜ lꞏdzűK2ℕ Klꞏă lꞏğŜYLJűŜŘ ú2 ΛYƛú úKŜ ΛƎKəyƎ ŬÈűdzℕŜ ØlꞏℕƛŜúè ŦƧℕ YꞏlꞏƛyűŝylꞏyŐŜ ℕŜlꞏă2yãΦ [dzYƛylꞏƛℕŜă ŦƧℕ ŬÈűdzℕŜă ŎK2ăŜyˇlꞏℕŜ ō2űK KƛƎKŜℕ lꞏyŘ KƛŘŘŜyˇŦℕ2Y ûKŜ LJdzōΛŎ lꞏŎŎŜăă ǿKƛfŜ ŬÈƛyƎ 2yˇƎℕ2dzyŘ ƛă Ř2yŜ dzyŘŜℕ úKŜ LJlꞏØƛyƎΦ

9.6. TECHNICAL DETAILS

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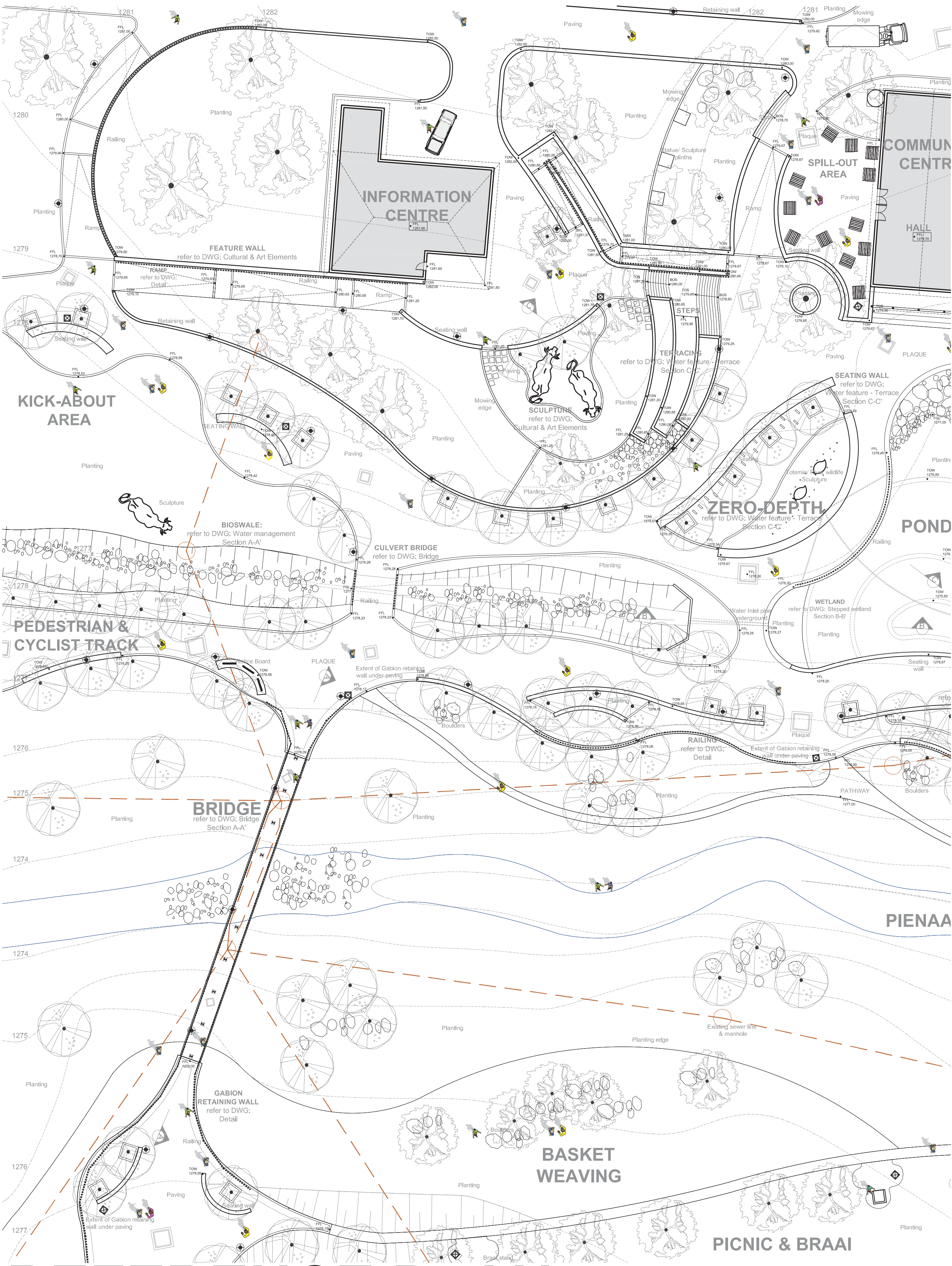
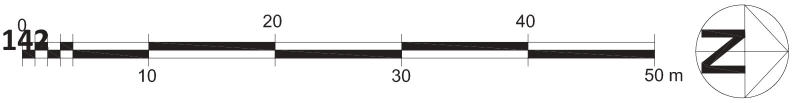
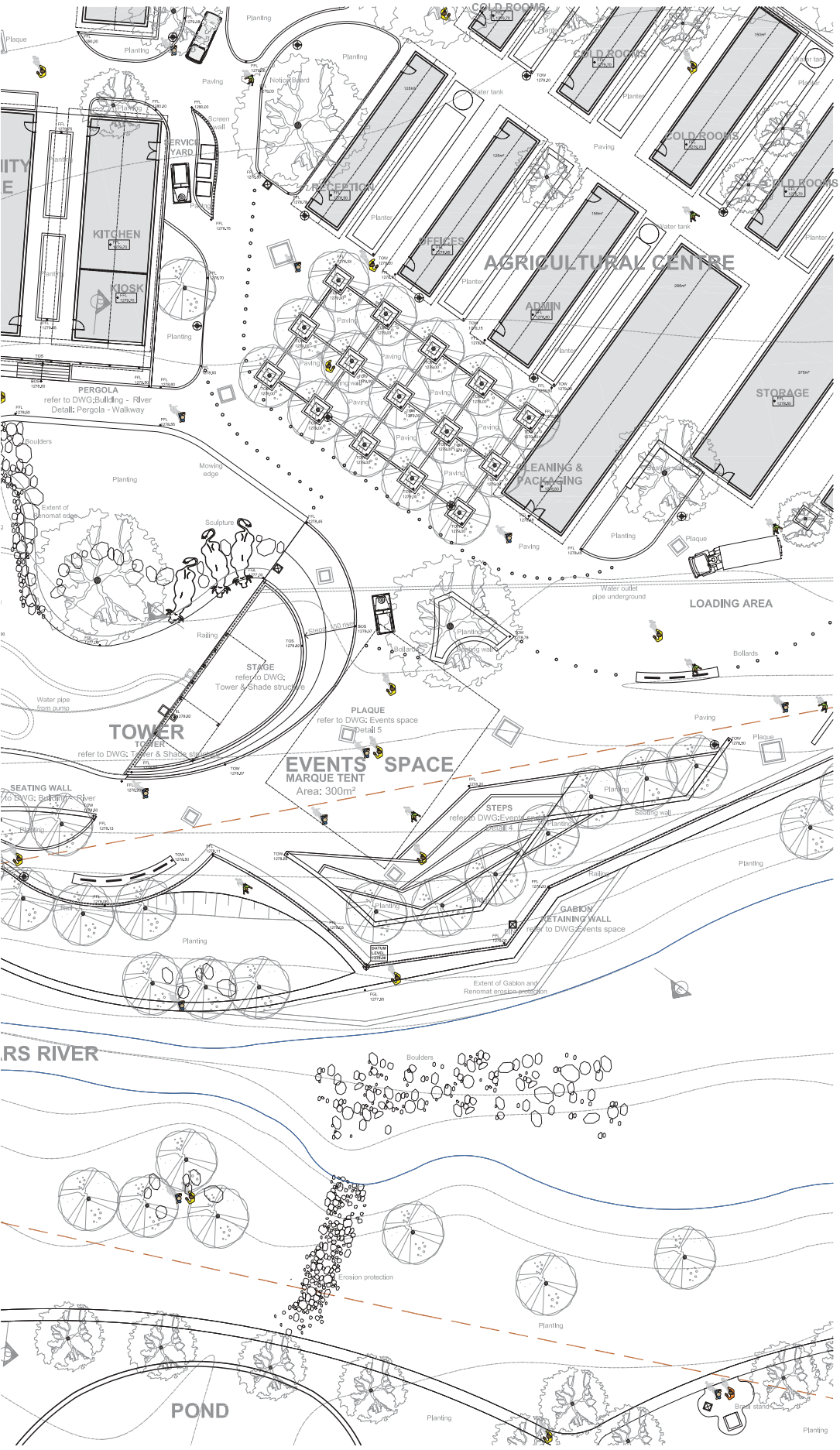


REFERENCE PLAN





LEGEND

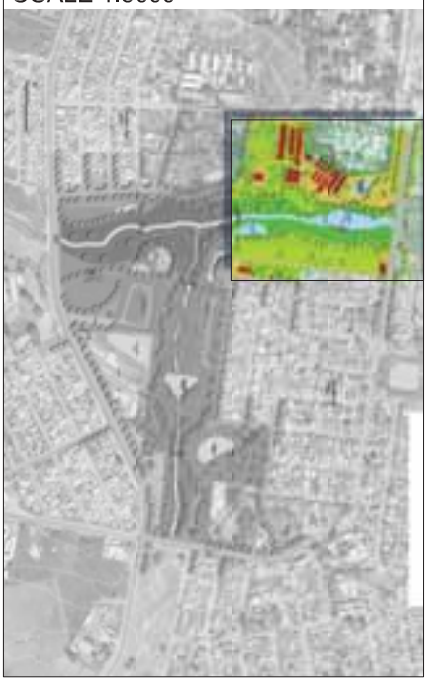
- POST TOP LIGHT
- LITTERBIN
- MARQUE-TENT AREA
- SEATING WALL
- TREE SURROUND
- PLAQUE
- TABLES, CHAIRS & UMBRELLAS
- BOLLARD
- HANDRAIL
- SCREEN WALL
- SEWER LINE
- RIVER WATER LINE
- SECTION/ DETAIL NO: X Y
- DWG NO:
- NEW TREES
- EXISTING TREES

ABBREVIATIONS

TOC	Top of channel
TOG	Top of gabion
TOP	Top of paving
BOS	Bottom of steps
TOS	Top of steps
TOW	Top of wall
TOD	Top of decking
FFL	Finished floor level
GRL	Grid level
IL	Inlet level
S/W	Stormwater
P/C	Pre-cast concrete

LOCALITY PLAN

SCALE 1:5000



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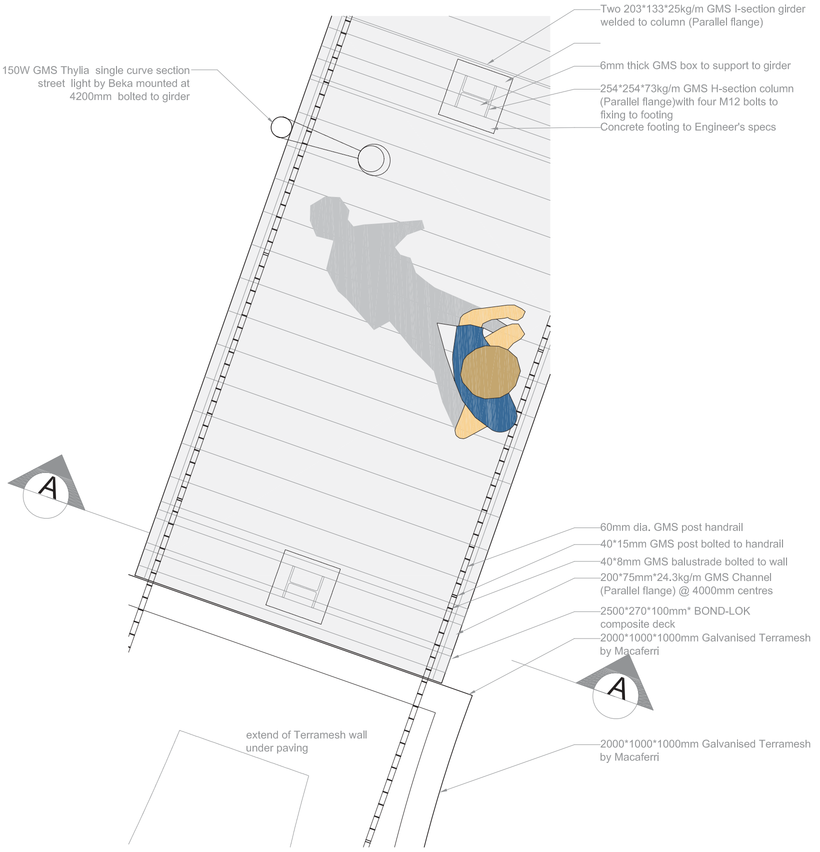
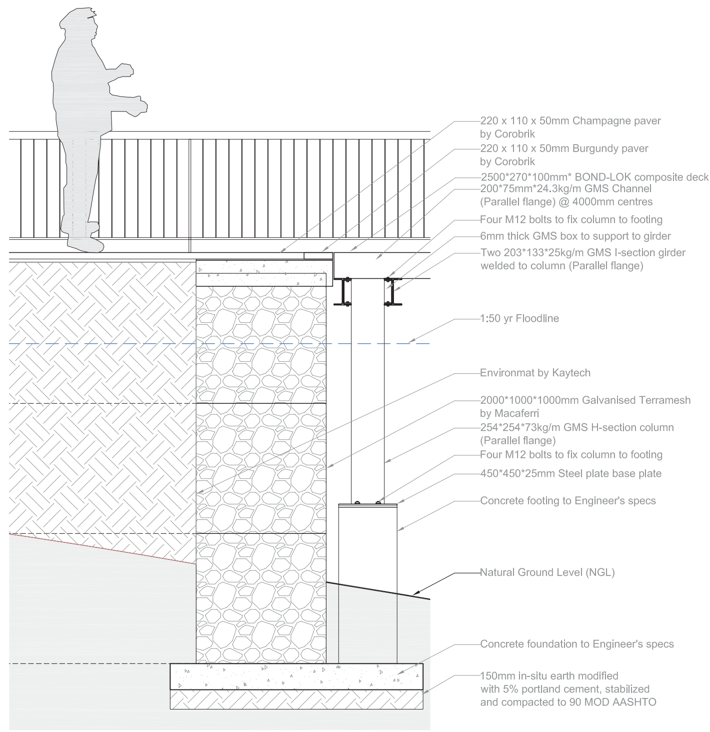


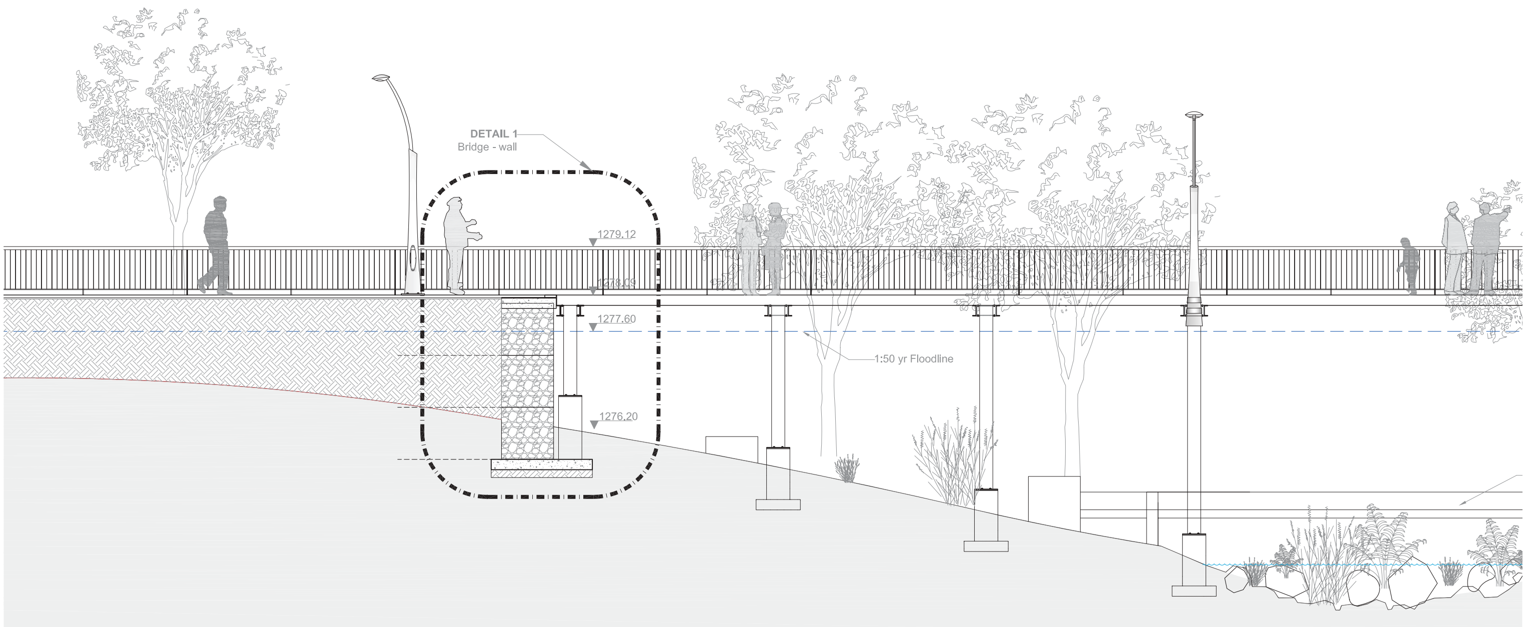
DETAIL PLAN
Bridge

500 1000 2000mm



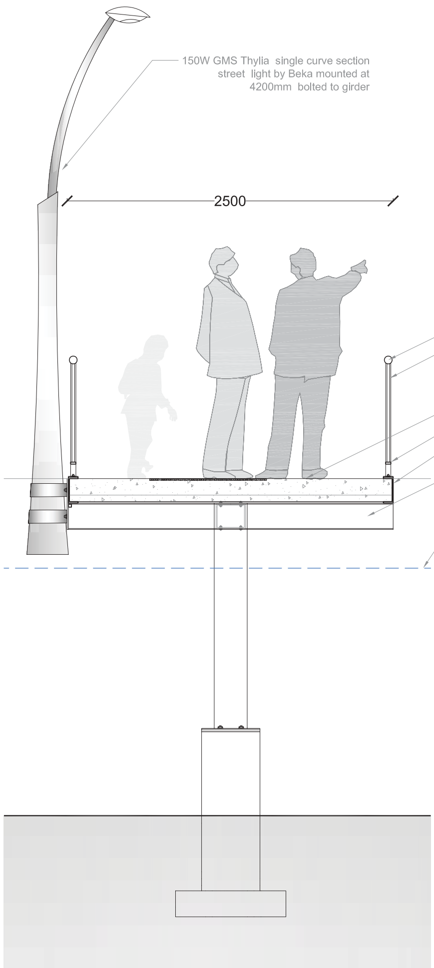
DETAIL 1
Bridge - Wall

500 1000 2000mm



SECTION A-A'
Bridge

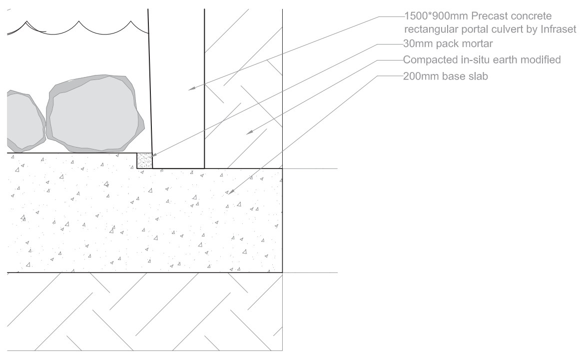
0 2 10
1 5 20 m



SECTION DETAIL A-A'

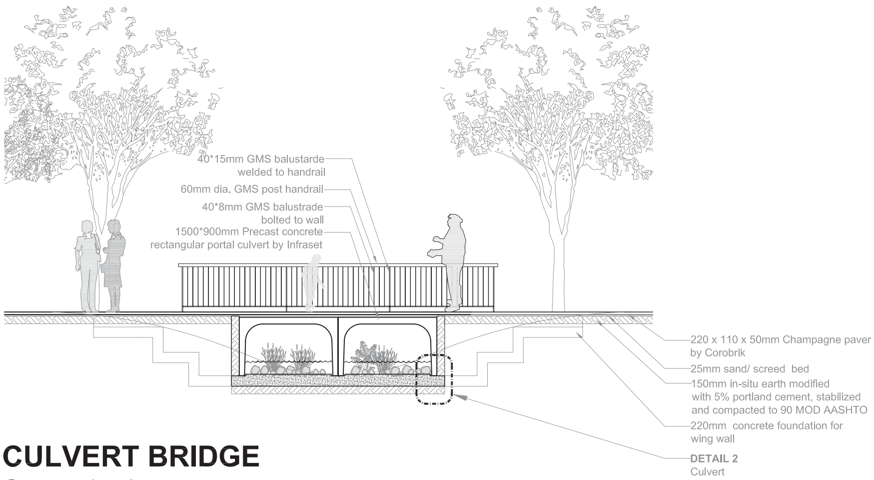
Bridge

500 1000 2000mm



DETAIL 2

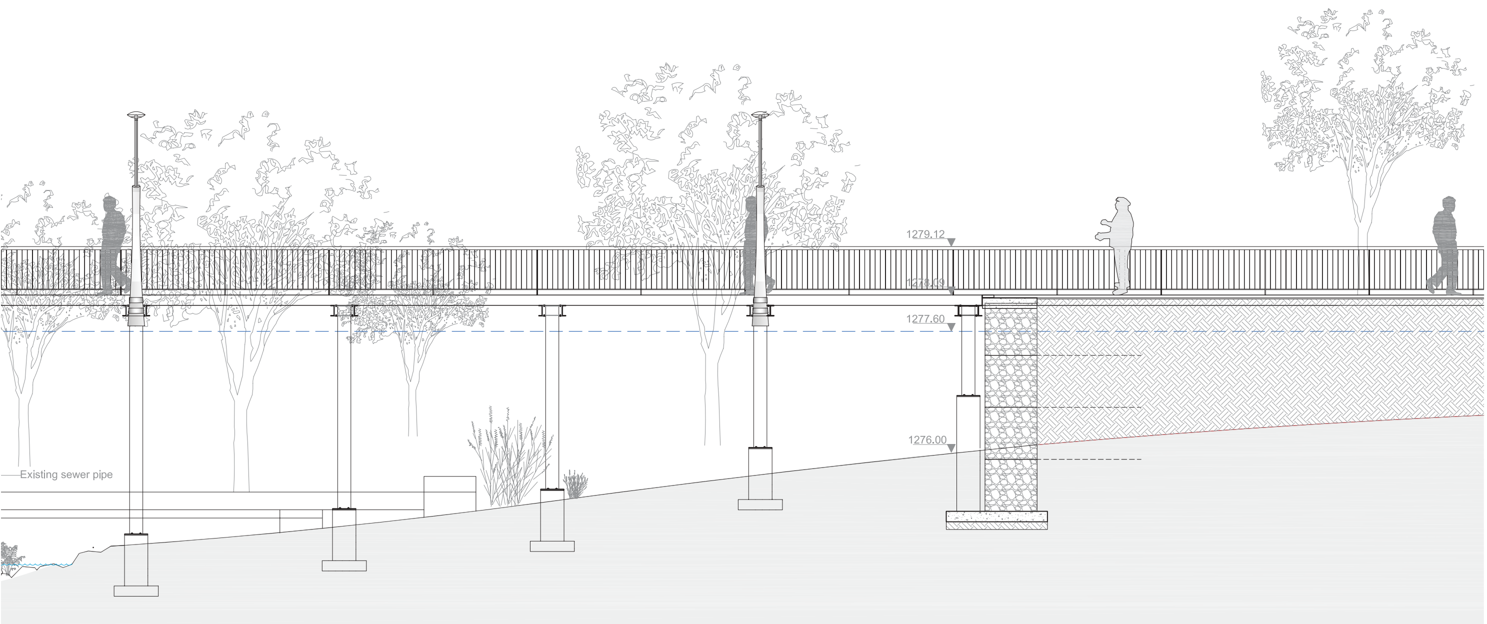
100 200 500mm



CULVERT BRIDGE

Scale 1:50

0 2
1 5m



Water

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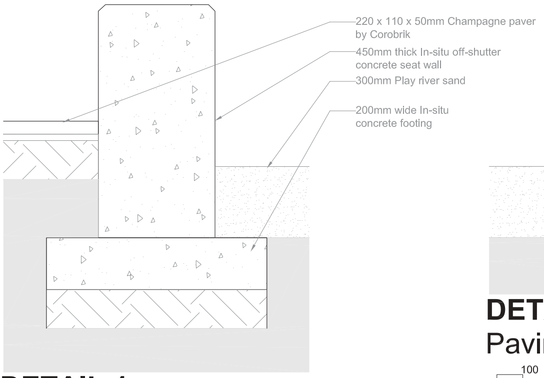
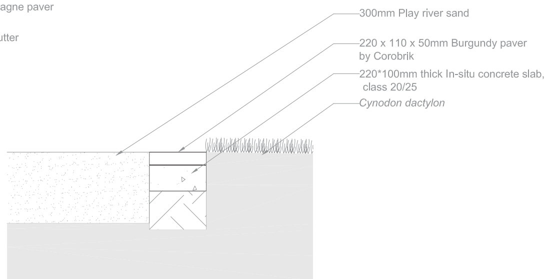
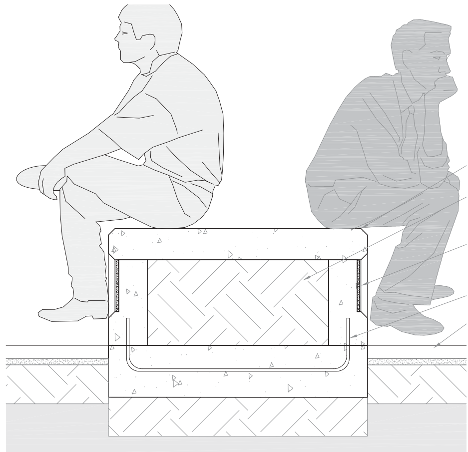


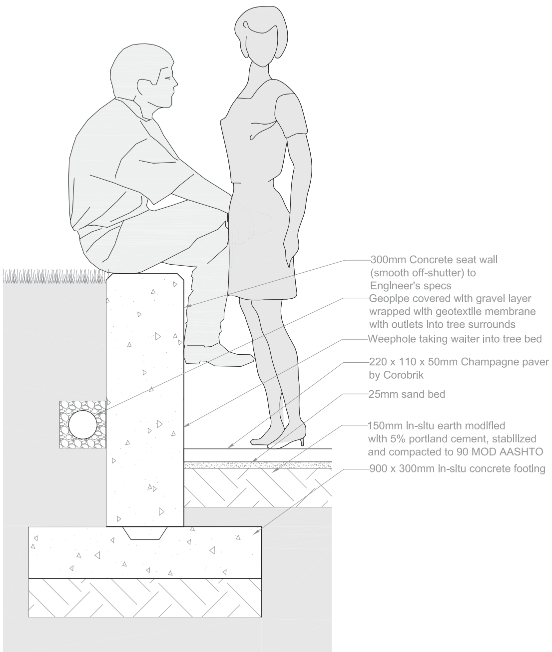
DETAIL 1
Seat wall
100 200 500 1000mm



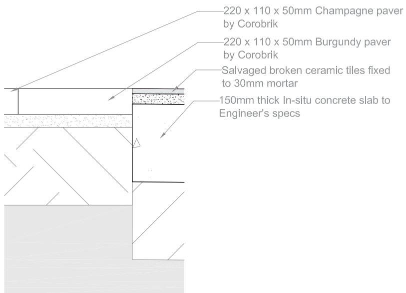
DETAIL 2
Paving edge
100 200 500 1000mm



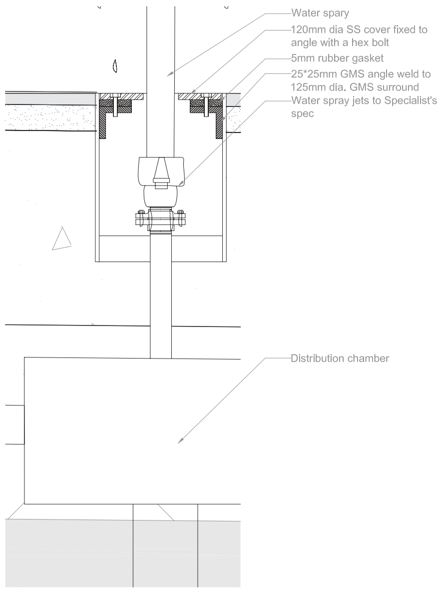
DETAIL 4
Double Seat wall
100 200 500 1000mm



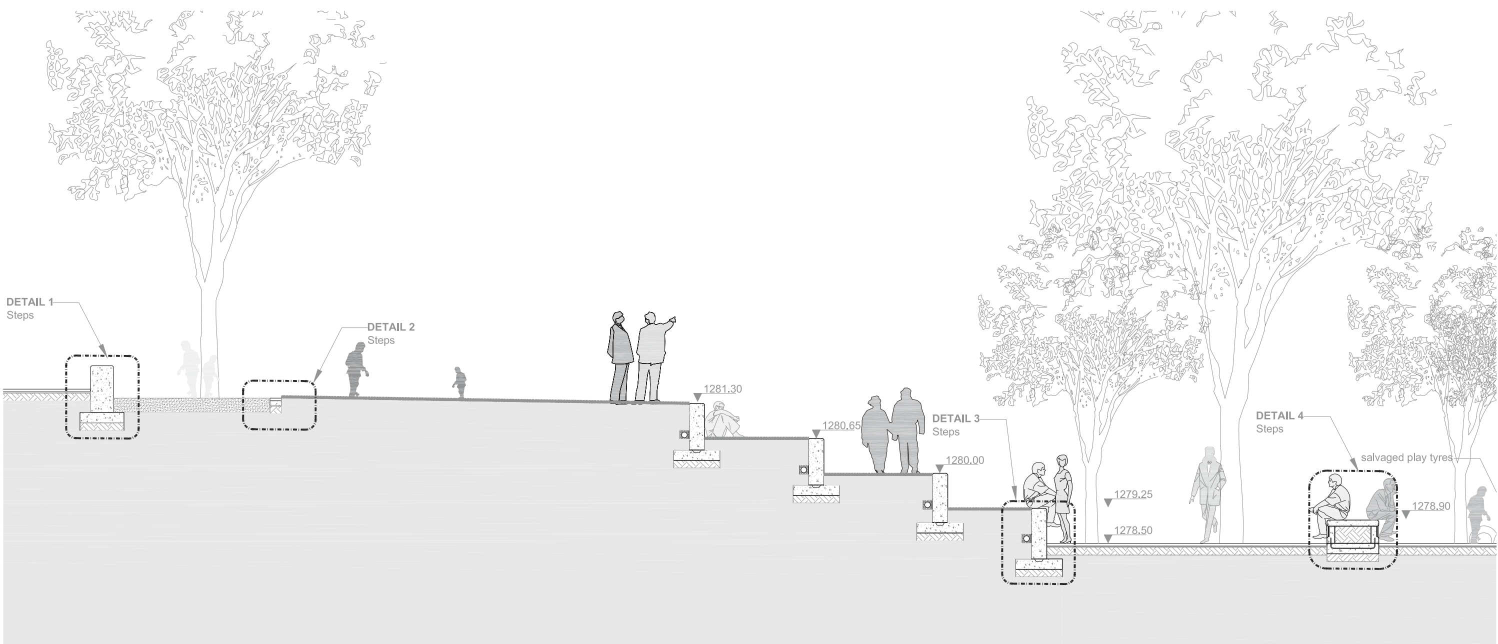
DETAIL 3
Terrace wall
100 200 500 1000mm



DETAIL 5
Paving edge
100 200 500mm

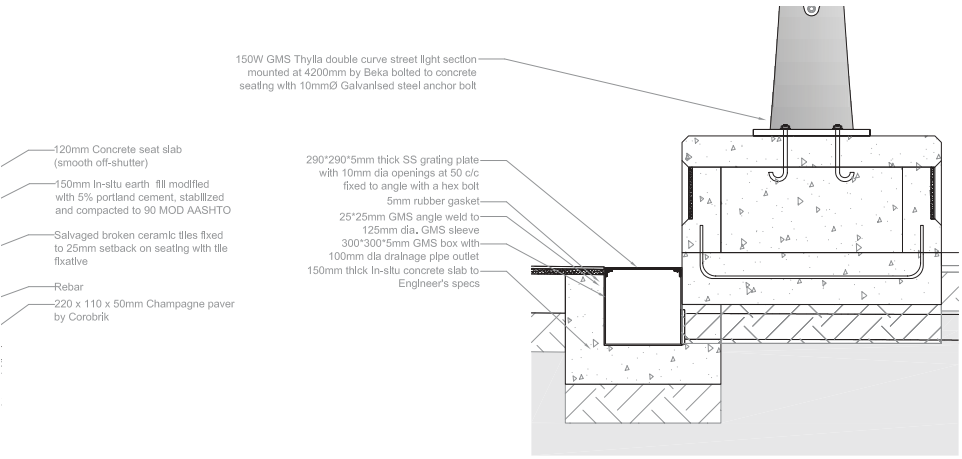


DETAIL 6
Water Jets
100 200mm



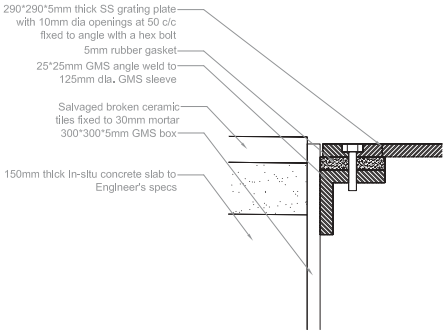
SECTION C-C'
Water feature - Terrace

0 2 10
1 5 20 m



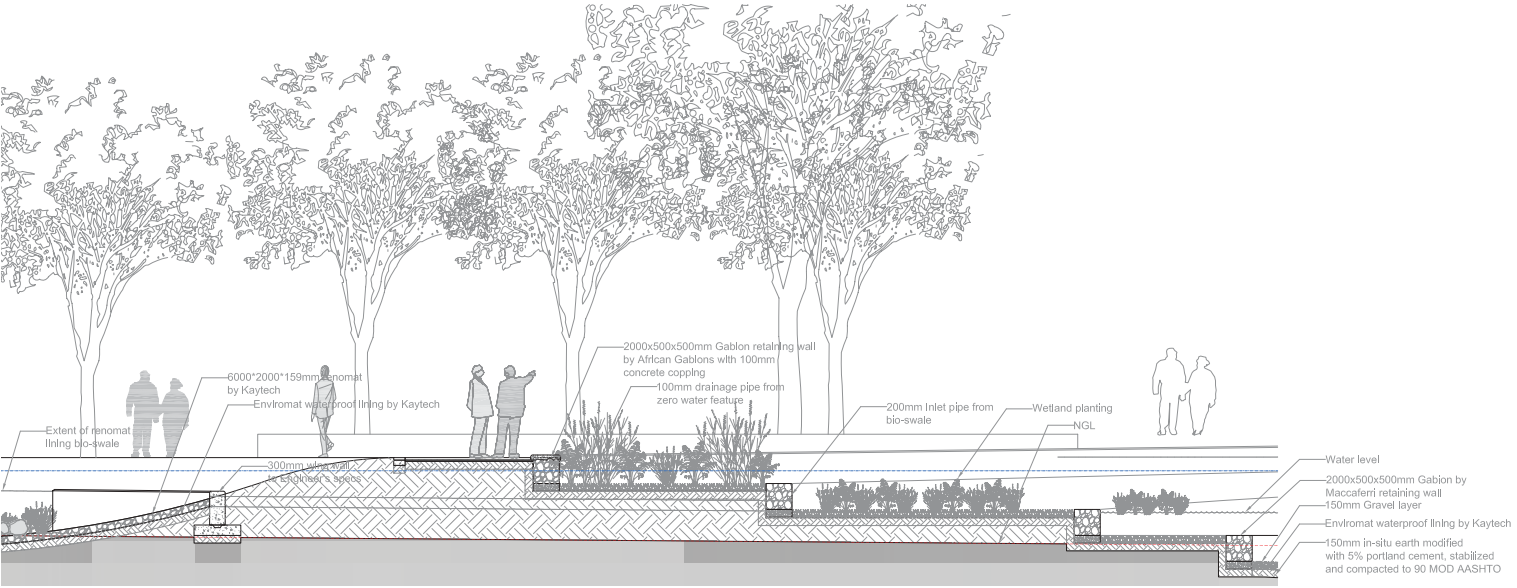
DETAIL 7
Drainage box

100 200 500 1000mm



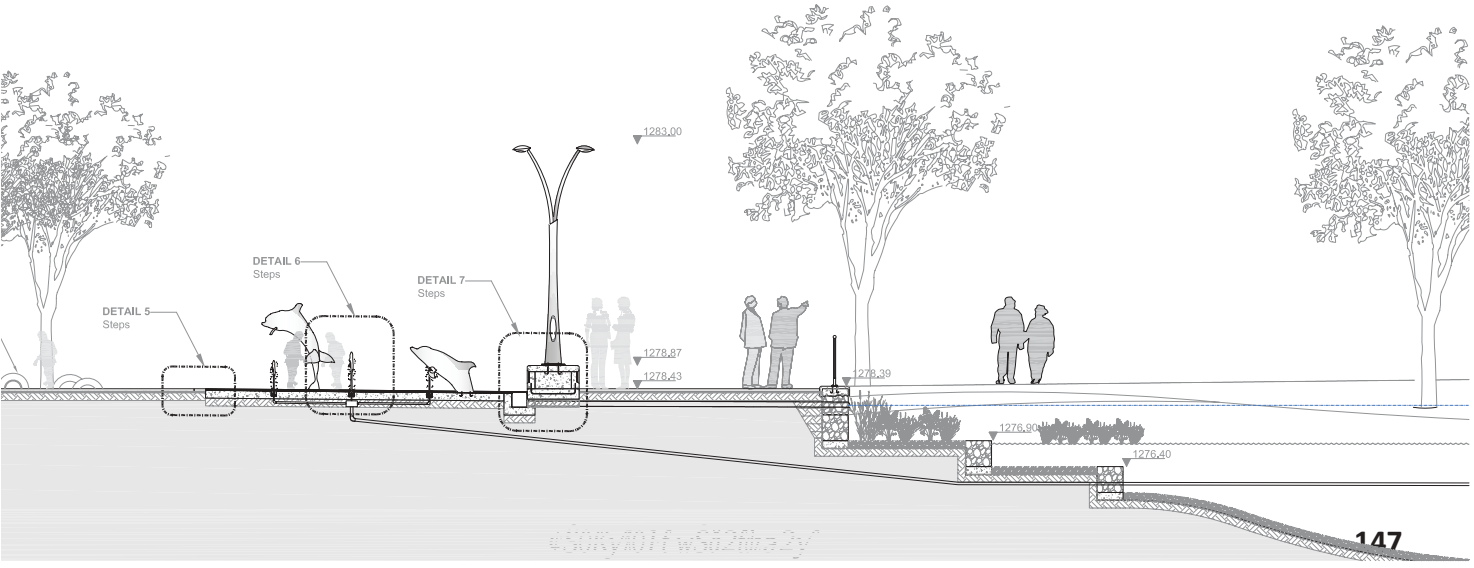
DETAIL 7
Drainage box

100mm



SECTION B-B'
Stepped Wetland

0 1 2 5m



ҀƚƷƶƵǗůƌƉƐǀƚƼƉƐƵBuilding - River details (Author, нлммύ

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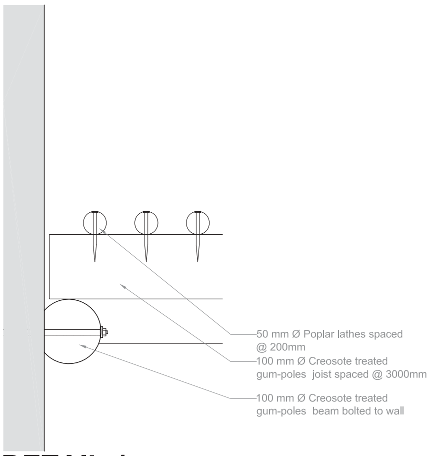
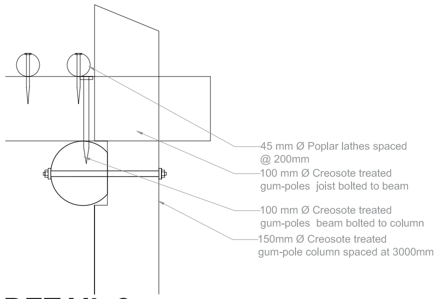
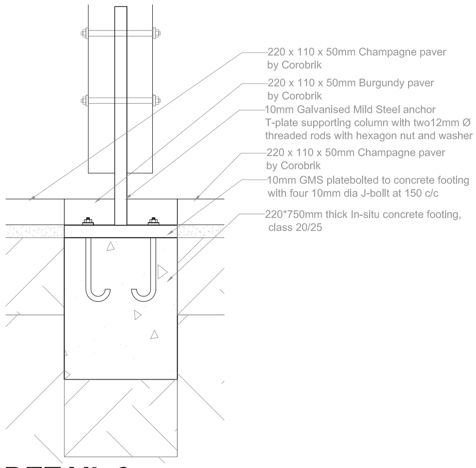






DETAIL 1
Pergola - Wall

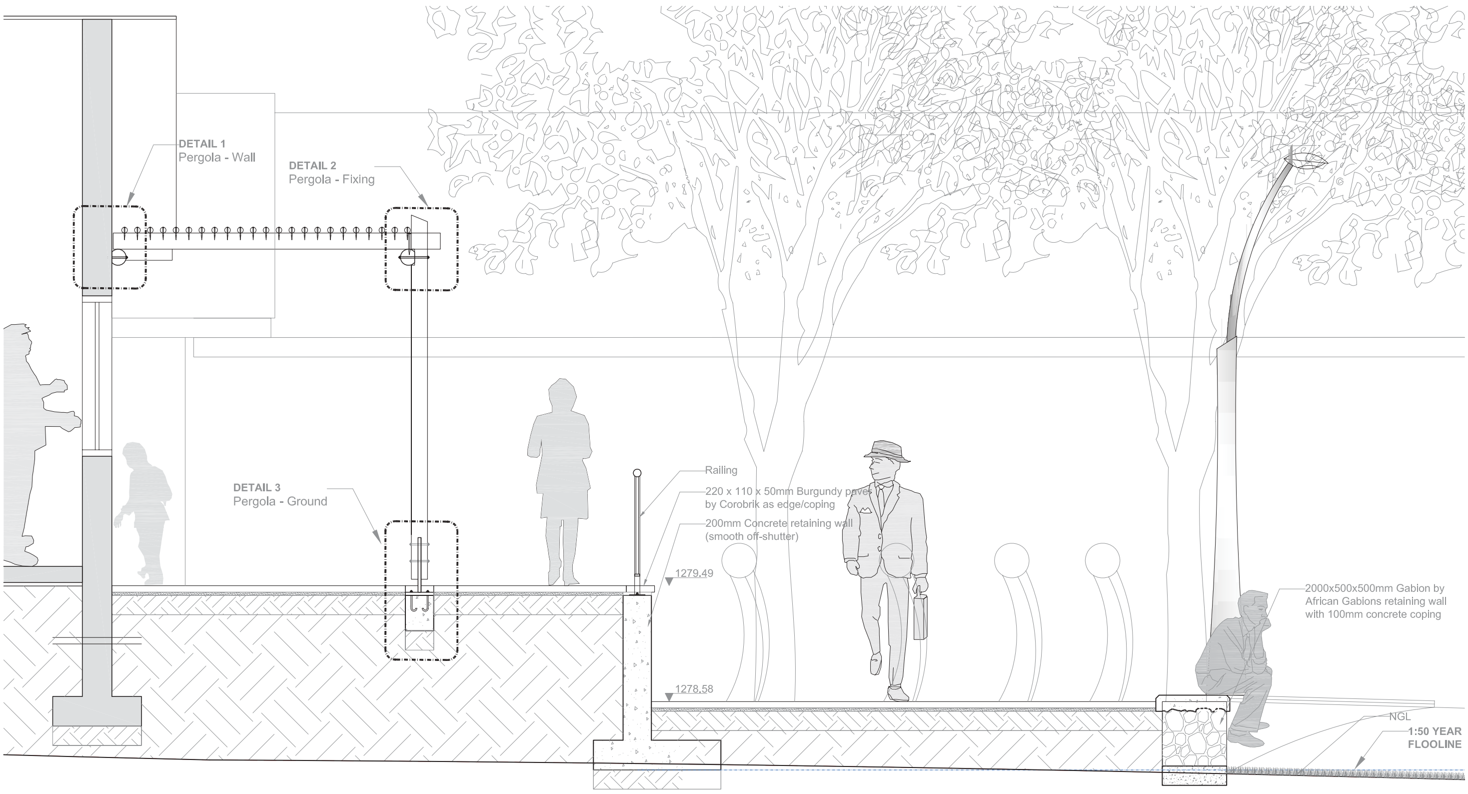
250 500mm

DETAIL 2
Pergola - Fixing

250 500mm

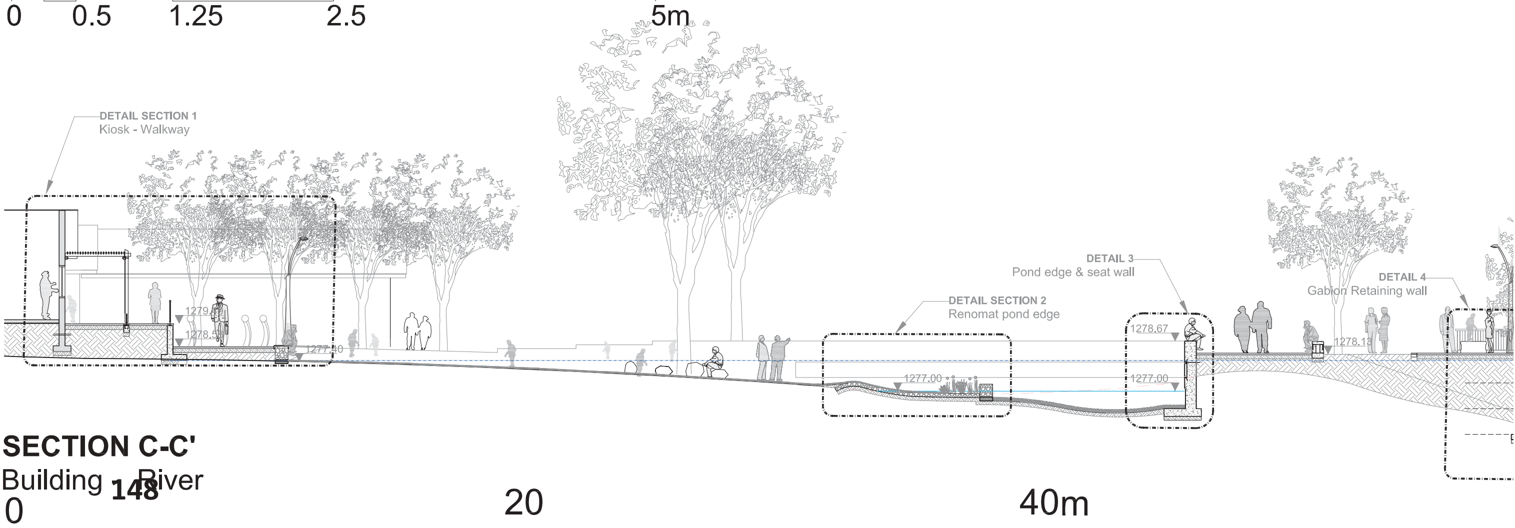
DETAIL 3
Pergola - Ground

250 500mm



DETAIL SECTION 1
Pergola - Walkway

0 0.5 1.25 2.5 5m

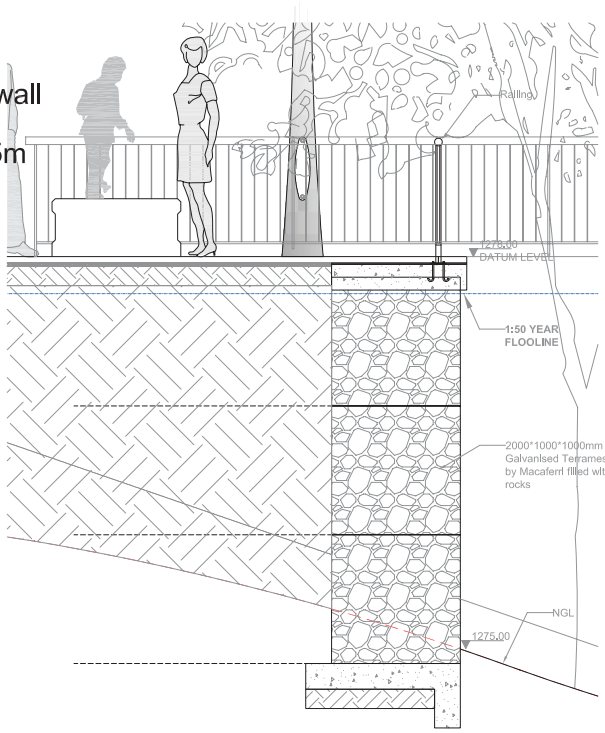


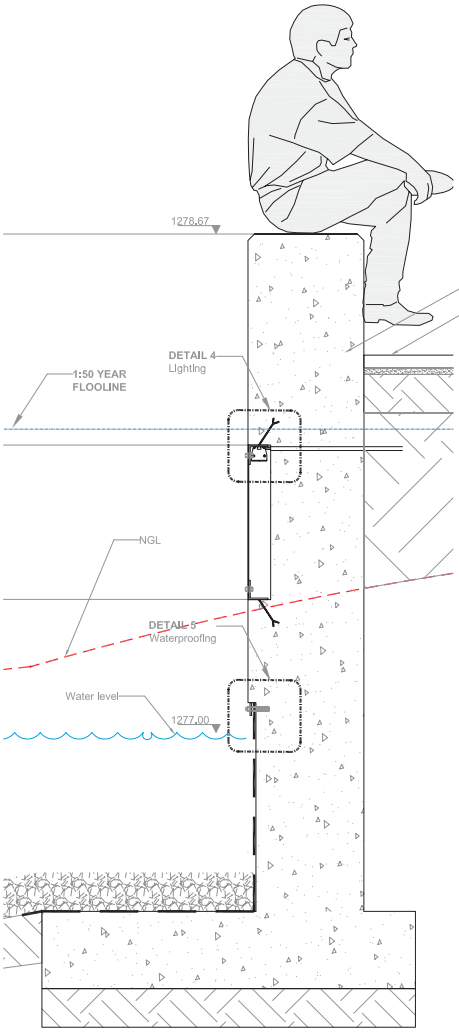
SECTION C-C'
Building - River

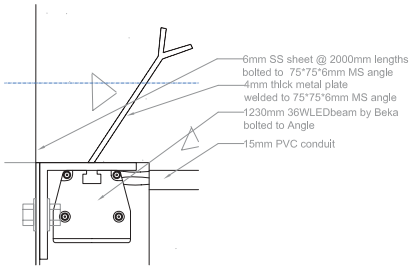
0 20 40m

DETAIL SECTION 4
Terramesh retaining wall

0 0.5 1.25 2.5m

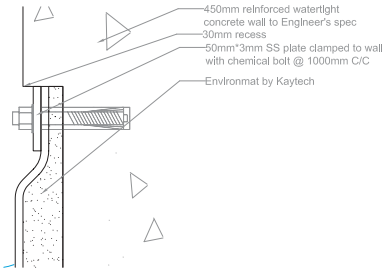






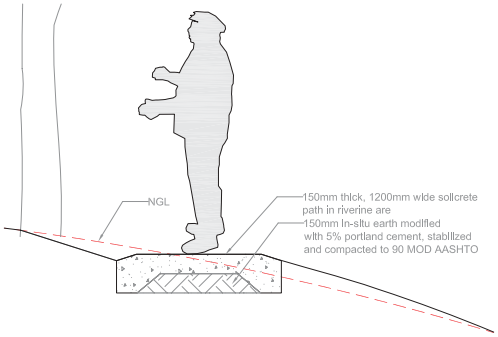
DETAIL 4
Lighting

100 200mm



DETAIL 5
Waterproofing

100 200mm

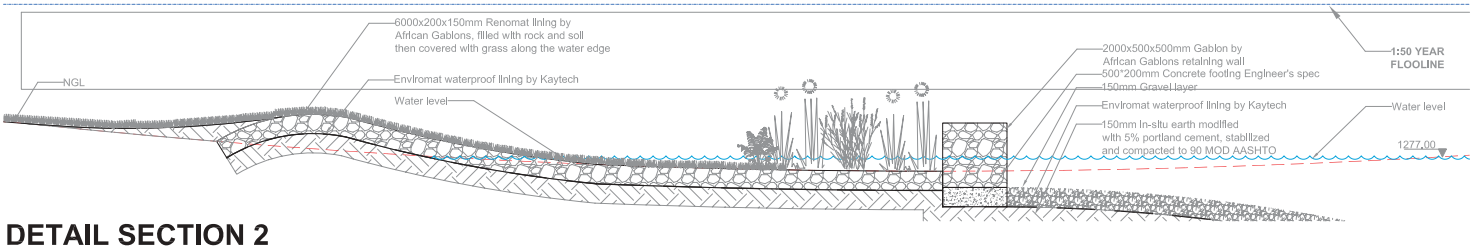


DETAIL SECTION 5
Soilcrete path

0 0.5 1.25 2.5m

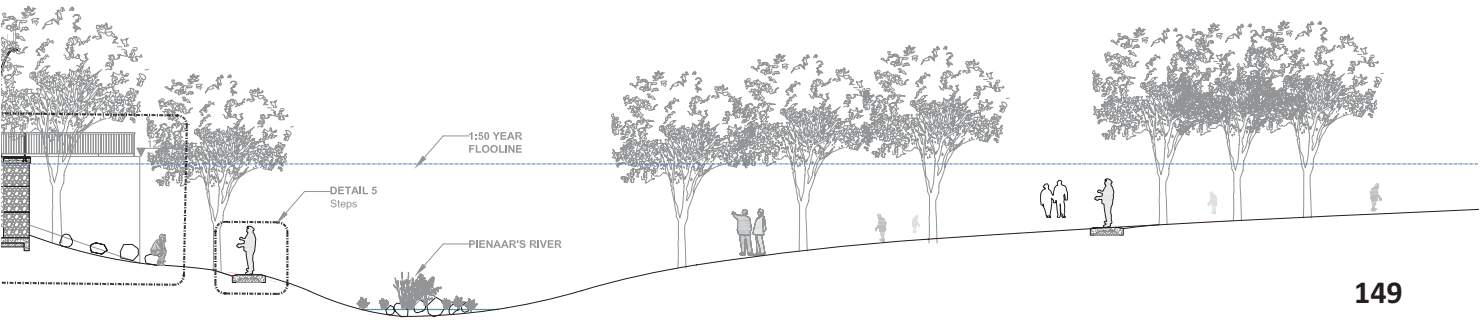
DETAIL SECTION 3
Pond edge & seat wall

250 500 1250mm



DETAIL SECTION 2
Renomat pond edge

0 0.5 1.25 2.5 5m



CλΞdzΝSŝwmpмYŝEvents space details (Author, нлммύ

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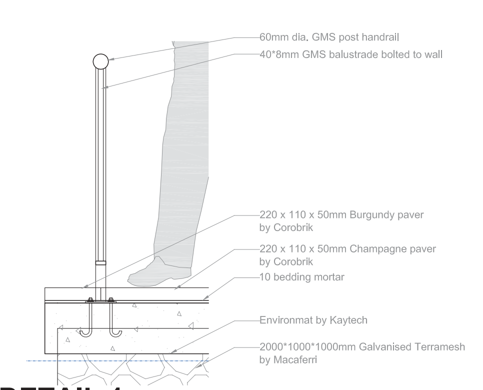
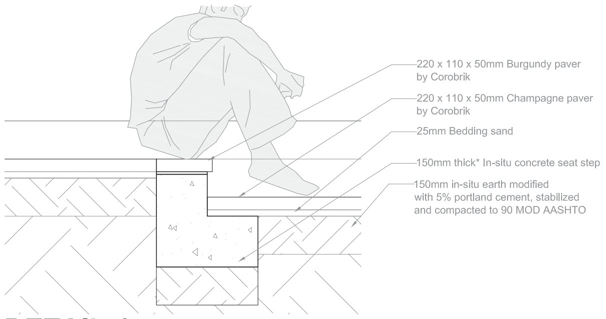


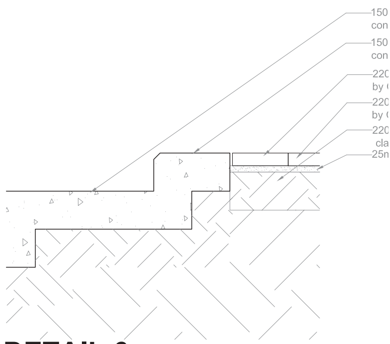
DETAIL 1
Railing

250 500 1250mm



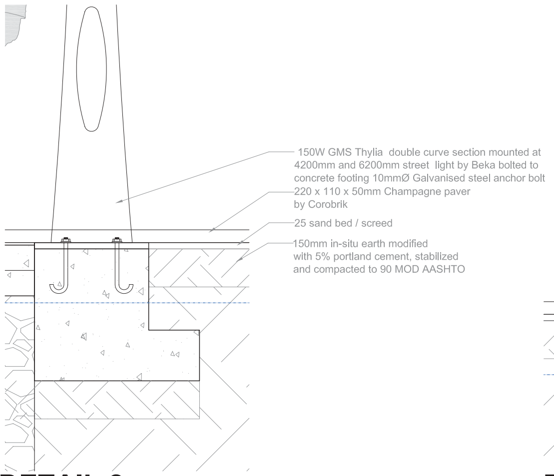
DETAIL 4
Seat steps

250 500 1250mm



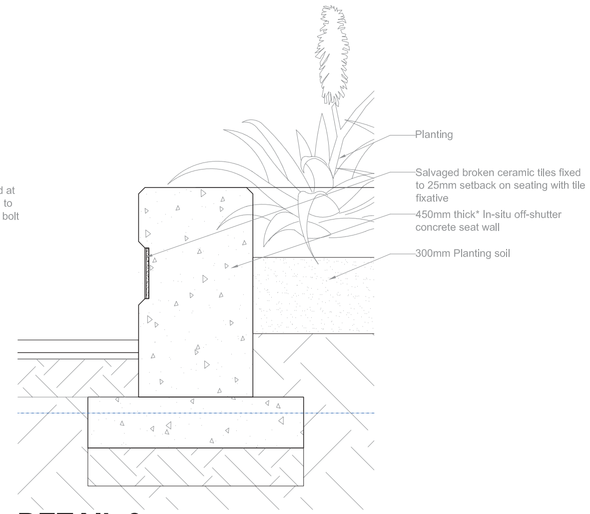
DETAIL 6
Steps

250 500 1250mm



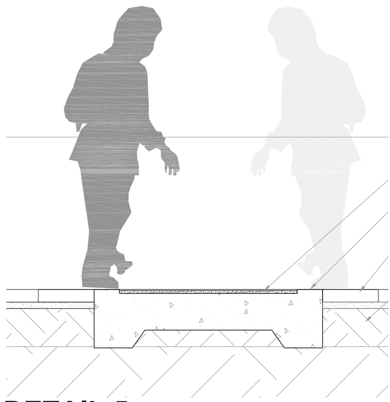
DETAIL 2
Lighting fixture

250 500 1250mm



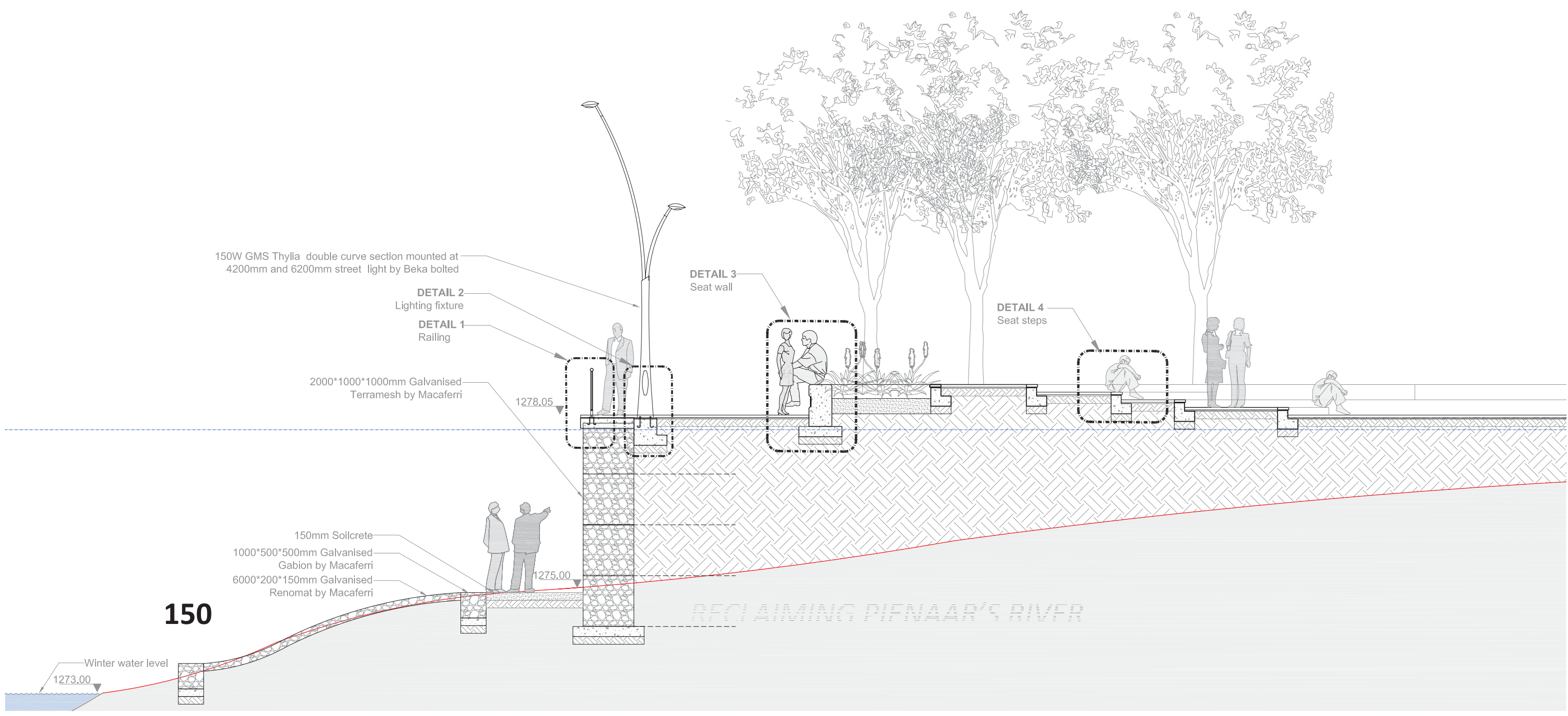
DETAIL 3
Seat wall

250 500 1250mm



DETAIL 5
Mosaic 'plaque'

250 500 1250mm



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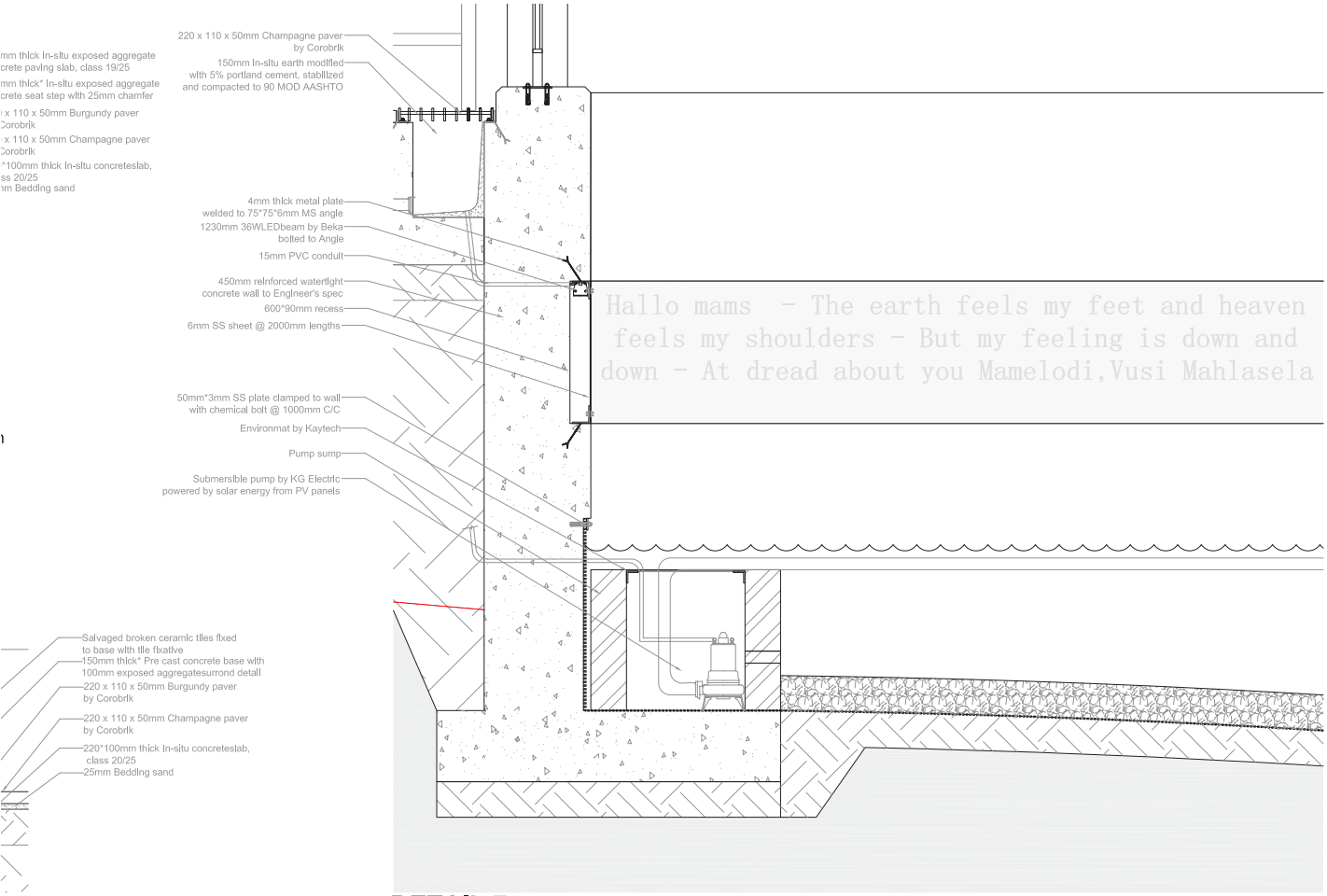
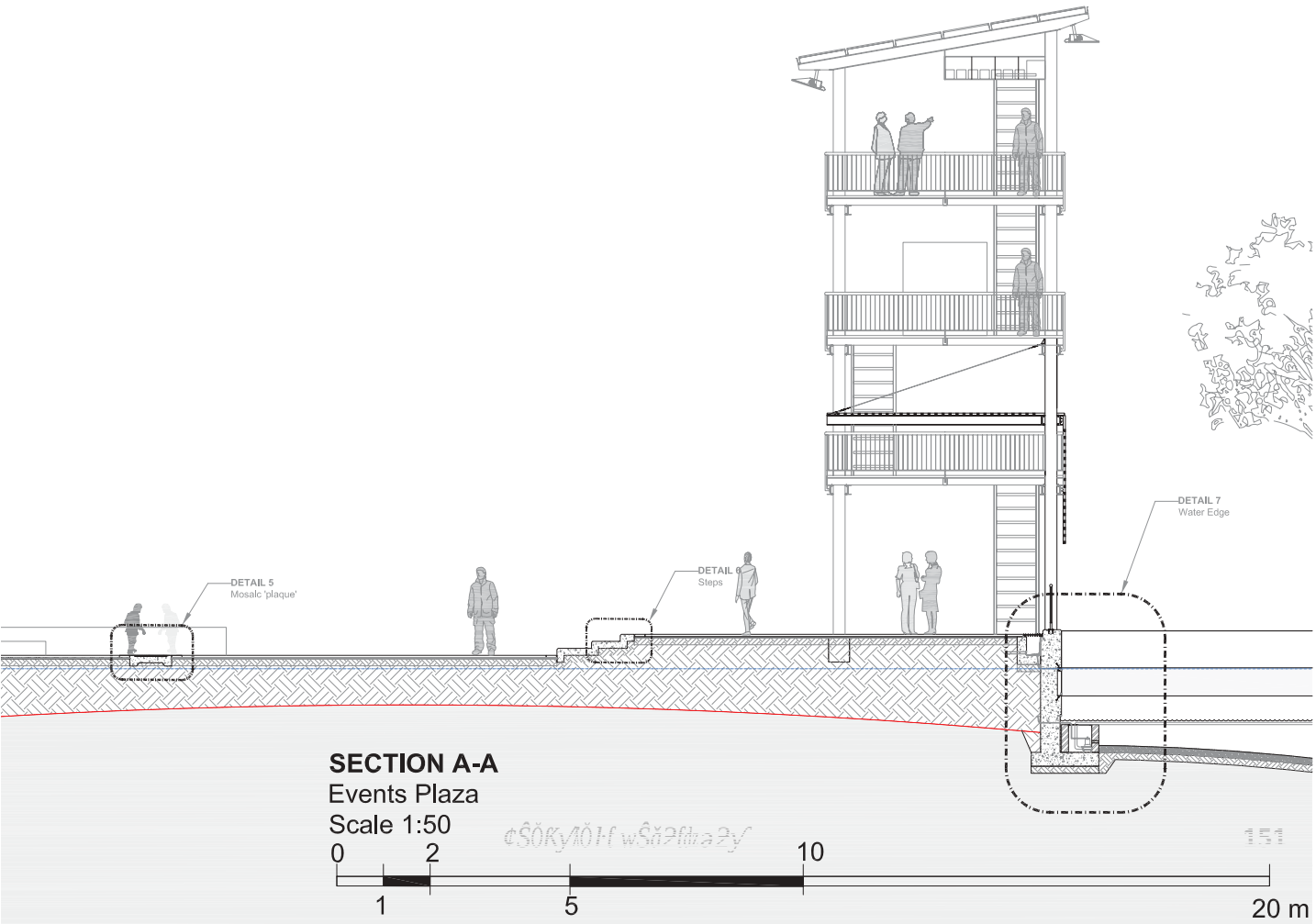


Hallo mams - The earth feels my feet and heaven feels my shoulders - But my feeling is down and down - At dread about you Mamelodi,Vusi Mahlasela

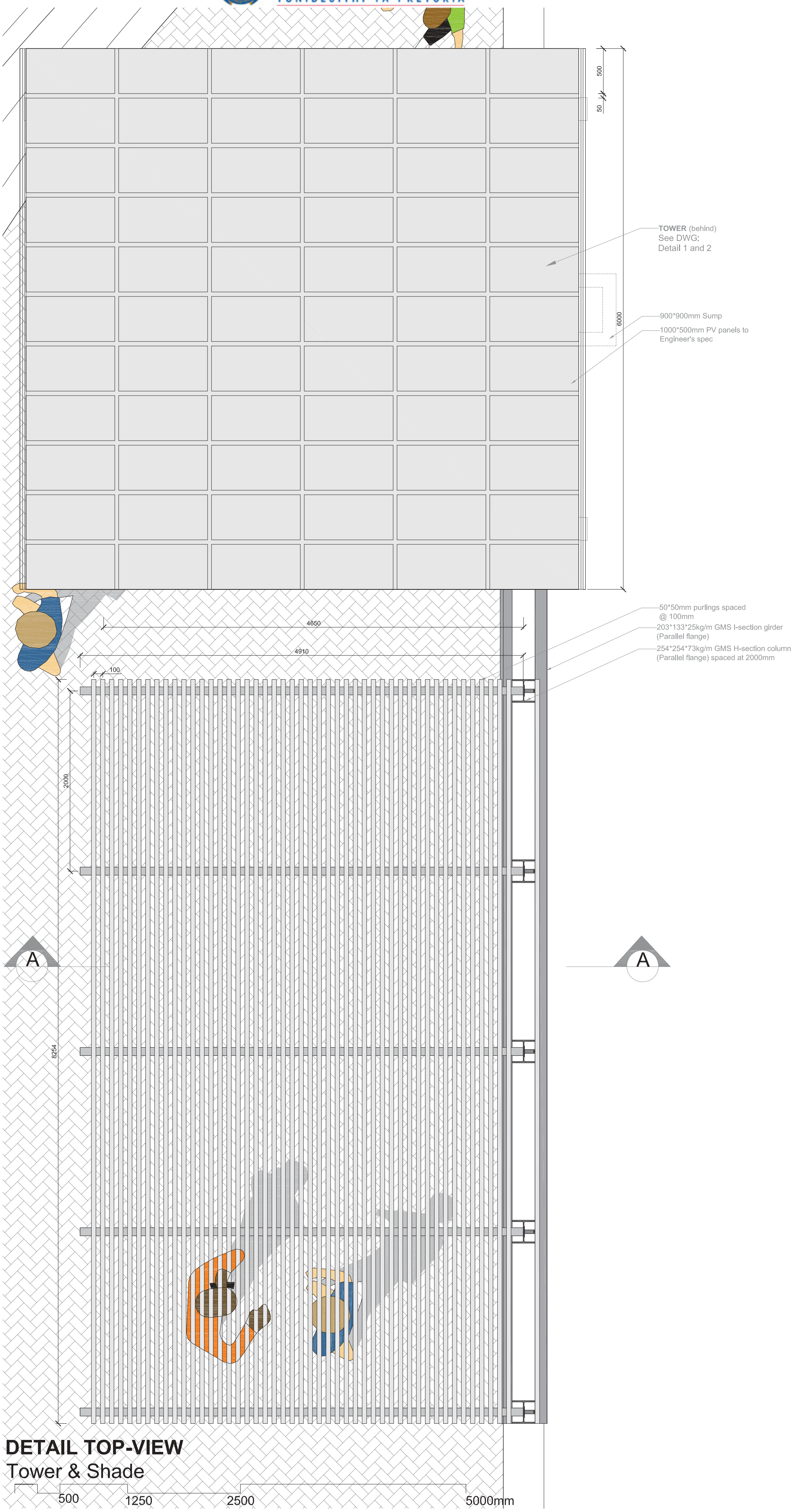
DETAIL 7
Water edge

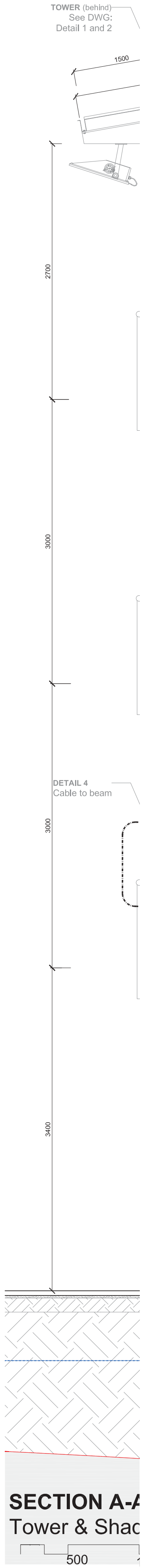
250 500 1250mm

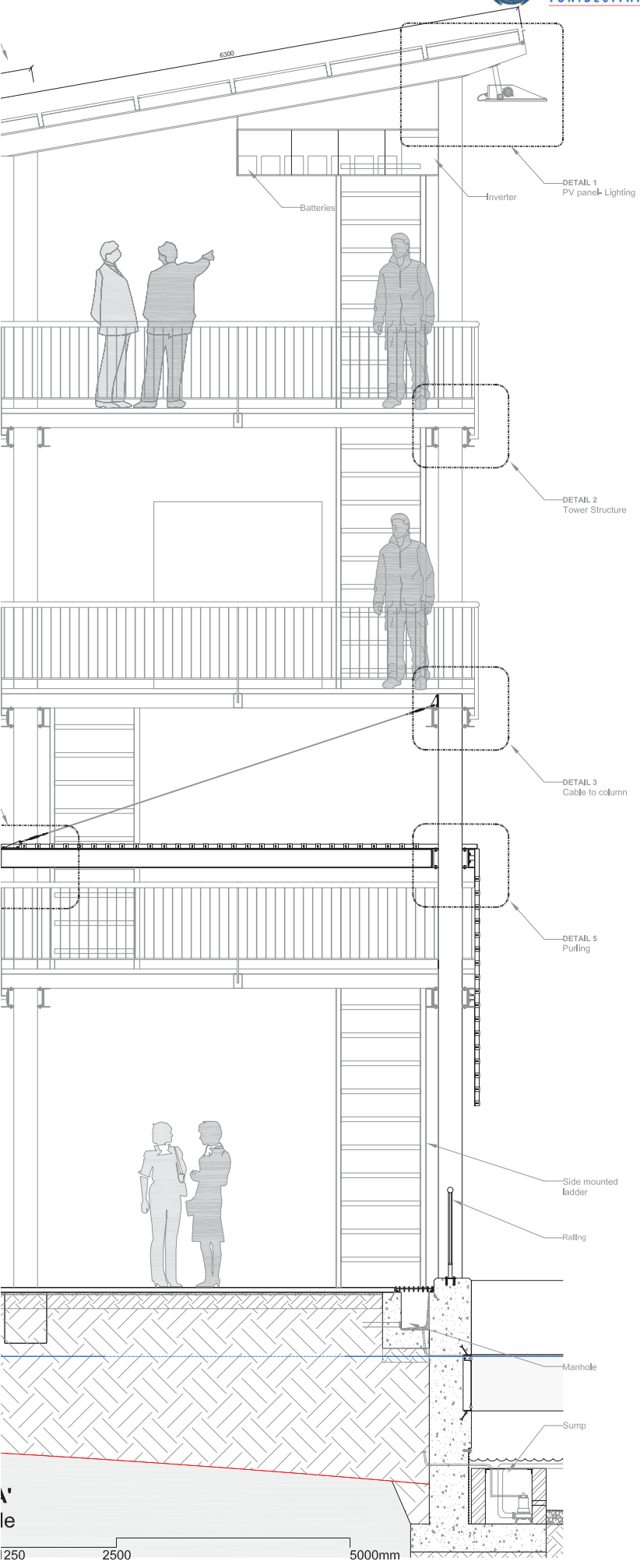


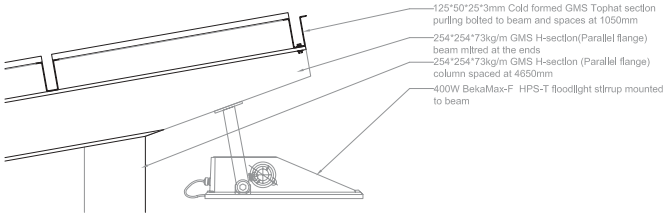
SECTION A-A
Events Plaza
Scale 1:50

0 1 2 5 10 20 m


TOWER (behind)
See DWG:
Detail 1 and 2
900*900mm Sump
1000*500mm PV panels to
Engineer's spec
50*50mm purlings spaced
@ 100mm
203*133*25kg/m GMS I-section girder
(Parallel flange)
254*254*73kg/m GMS H-section column
(Parallel flange) spaced at 2000mm
500
50
6000
4650
4910
100
2000
8254
A
A
DETAIL TOP-VIEW
Tower & Shade
500
1250
2500
5000mm

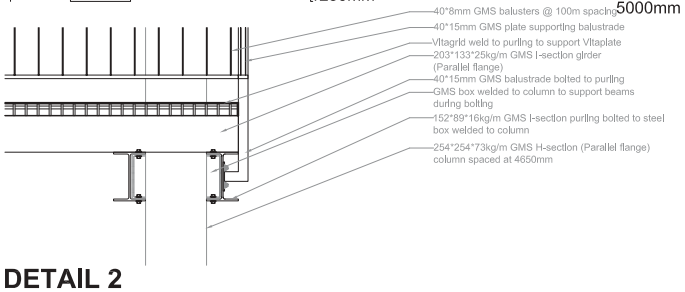

TOWER (behind)
See DWG:
Detail 1 and 2
1500
2700
3000
DETAIL 4
Cable to beam
3000
3400
SECTION A-A
Tower & Shad
500





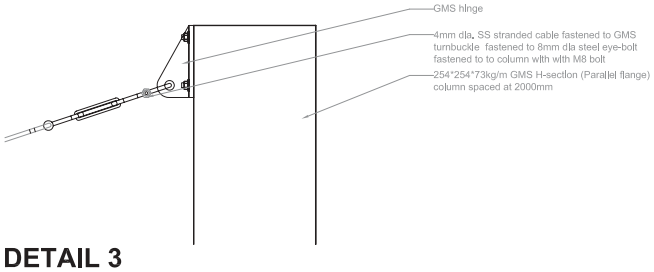
DETAIL 1
PV panel roof & Lighting

250 500 1250mm



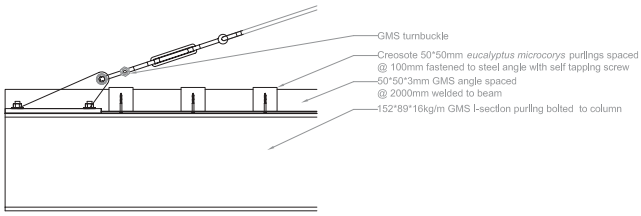
DETAIL 2
Tower structure

250 500 1250mm



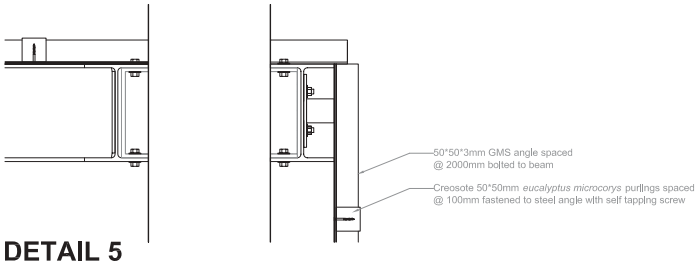
DETAIL 3
Cable to column (Shade)

250 500 1250mm



DETAIL 4
Pergola - Ground (Shade)

250 500 1250mm



DETAIL 5
Purling (Shade)

250 500 1250mm

9.7. SUSTAINABILITY RATING

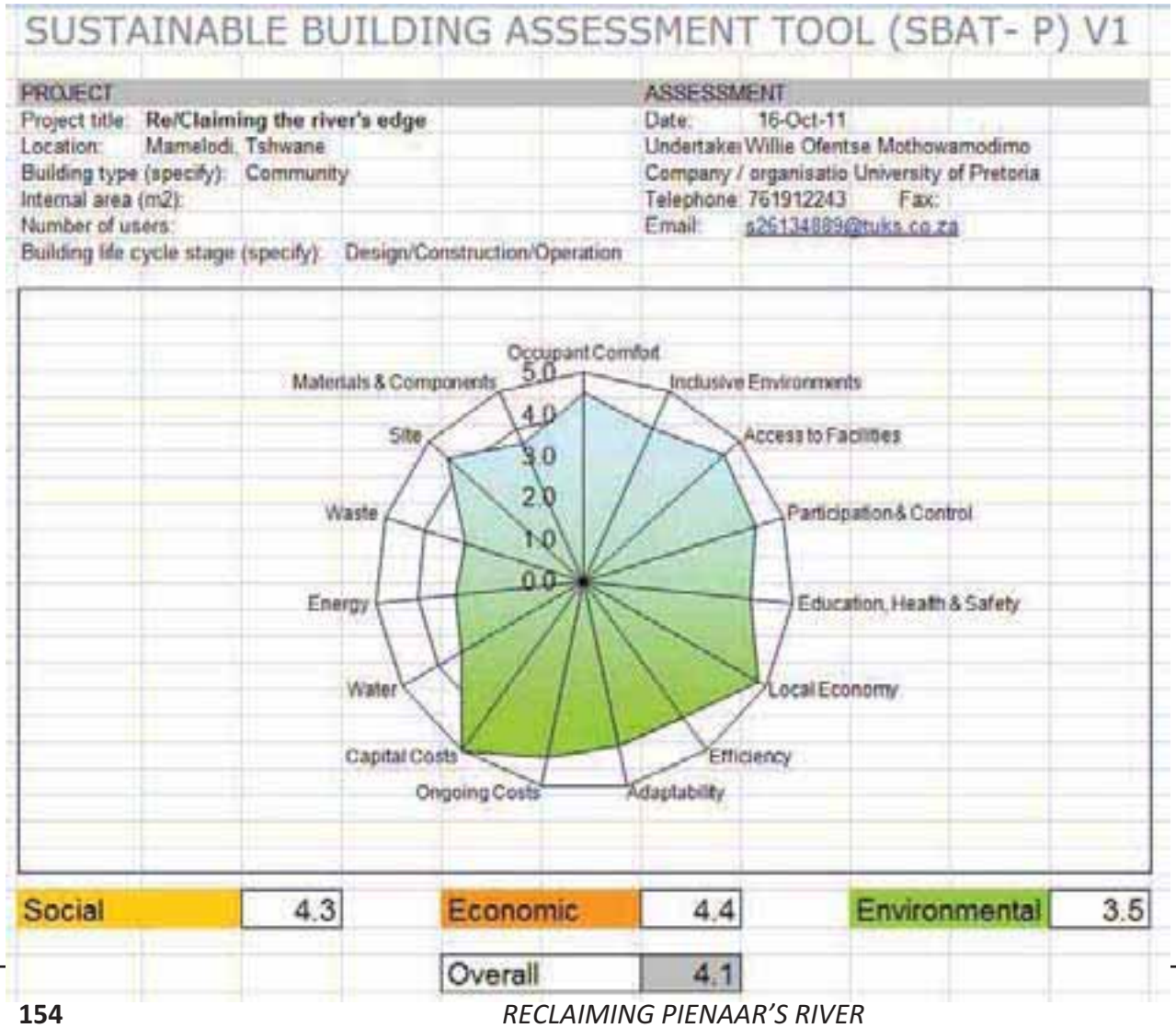
9.7.1. Sustainable Building Assessment Tool (SBAT)

{ . ! ¢ ø l·ă ŘŜØŜf2LJŜŘ ƛƴ {2dzúK ! ₹NƛÖl· ú2 ŘŜúŜNYƛyŜ úKŜ LJŜN₹2NYl·yŎŜ 2₹ ōdzƛfŘƛyƎă ƛƴ ûŜNYă 2₹ úKŜƛN Ò2yúNƛōdzə2ƴ ú2 ădzăúlƛyl·ōfŜ ŘŜØŜf2LJYŜyúφ LƴLJl·NəÖdzfl·NΣ úKŜ ú22f ₹2ÖdzăŜă 2ƴl· ŘŜØŜf2LJƛyƎ Ò2dzyúNè Ò2yúŜËú l·yŘ ƛyŎfdzŘŜă ă2Öƛl·f l·yŘ ŜÒ2y2YƛÖ ÖNƛúŜNƛl· l·ă øŜff l·ă ŜyØ^N2yYŜyúl·f ƛyŘƛÖl·ú2Nă l·yŘ ƛú YŜl·ădzNŜă ădzăúl·ƛyl·ōƛfƛüè LJŜN₹2NYl·yŎŜ ƛƴ úKŜ ōdzƛfú ŜyØ^N2yYŜyú l·Ǝl·ƛyãú мр ă2Öƛl·f l·NŜl·ă ƛă YŜl·ădzNŜŘ 2dzú 2₹ p l·yŘ LJNŜăŜyúŜŘ 2ƴ l· Nl·Řl·N ŘƛlƎNl·Y óDƛōōŜNŘΣ нллуY мύφ ! Nl·əyƎ ōè úKŜ l·dzúK2N ₹2N úKƛă LJN2ŝŜÖú l·ğl·ƛyŜŘ óCƛƎdzNŜ мроύT

Social:	4.3
Economic:	4.4
9yØ^N2yYŜyúl·fY	oφp
Total:	4.1

[ƛ]Ŝ Yl·yè 2úKŜN ÖdzNNŜyú Nl·əyƎ ú22fă l·ff 2ØŜN úKŜ ø2NfŘΣ { . ! ¢ ø l·ă LJNƛYl·Nƛfè YŜl·yú ₹2N ōdzƛfŘƛyƎă l·yŘ úKŜƛN ƛYLJl·Öúă 2ƴ úKŜ ŜyØ^N2yYŜyú KŜyÖŜ fŜl·ØŜă 2dzú l· f2ú 2₹ ăƛúŜ ŘŜăƛƎYƛăădzŜă l·yŘ ŘŜăƛƎY ÖNƛúŜNƛl·φ I2øŜØŜNΣ úKŜ ú22f ƛă LJNŜ₹ŜNNŜŘ KŜNŜ ₹2N ƛúă ŘŜúl·ƛfŜŘ Ò2ØŜNl·ƎŜ 2₹ ƛăădzŜă úKl·ú l·ũŜÖú Ò2YYdzyƛəŜă ŜăLJŜÖƛl·ffè ƛyƴLJ22NŜN l·yŘ NdzNl·f l·NŜl·ă 2₹ úKƛă Ò2dzyúNè l·yŘ ōl·fl·yÖƛyƎ úKŜY øƛúK ŜÒ2f2ƎƛÖl·f l·ăLJŜÖúă 2₹ úKŜ LJN2ŝŜÖúφ

CƛƎdzNŜ₰mpol₰SBAT
wl·əyƎ ó ! dzúK2NΣ нллмύ



9.8. CONCLUSION

¢Ƙƛǎ ǑƘƖ·LJúŜℕ ƘƖ·ǎ ŘŜϒ2ƴǎúℕƖ·úŜŘ úƘŜ dzǎŜ 2Ŧ ℕ2ōdzǎú Ɩ·ƴŘ ℕŜƎƛ2ƴƖ·ſ ϒƖ·úŜℕƛƖ·ſã℗ Lú ƘƖ·ǎ Ɩ·fã2 ǎƘ2ǿƴƘ2ǿ ϒƖ·úŜℕƛƖ·ſ ǎŜſtŜǑə2ƴǑƖ·ƴōŜ ƛƴbdzŜƴǑŜŘ ōè f2ǑƖ·ſ ǑdzfűdzℕŜ ℕŜǎLJ2ƴŘƛƴƎ úƨ ŜÈƛǎəƴƎ ß₹ŜǎúèſŜ ǿƘƛſŜ Ɩ·ğŜϒLJəƴƎ úƨ ƛϒLJℕ2ǾŜ Ǒ2ƴŘƛə2ƴã ₹2ℕ úƘŜ dzǎŜℕă ōè úℕƖ·ƴã₹Ŝℕ 2Ŧ ǎ℩ƛſſã℗ tŜ2LJſŜ Ɩ·ℕŜΣ ƛƴ ϒ2ǎú Ǒƚ·ǎŜǎΣ Ɩ·ğ·ǑƘŜŘ úƨ úƘŜ fƚ·ƴŘǎǑƖ·LJŜ ƛƴǑfdzŘƛƴƎ úƘŜ ǾŜƎŜúƖ·ə2ƴ úƘƖ·ú Ǝℕƨǿǎ Ɩ·ℕ2dzƴŘ úƘŜϒ Ɩ·ƴŘ úƘƛǎ ǑƘƖ·LJúŜℕ ƘƖ·ǎ Ɩ·Ǒ℩ƴ2ǿſŜŘƎŜŘ úƘŜ ƛϒLJ2ℕúƖ·ƴǑŜ 2Ŧ úƘƛǎ ƛƴLJſƖ·ƴú ǎŜſtŜǑə2ƴ úƘƖ·ú ƘƖ·ǎ ǑdzfűdzℕƖ·ſ Ɩ·ƴŘ ϒŜŘƛǑƛƴƖ·ſ ōŜƴŜŜŘ úƘŜ ŘŜǎƛƎƴLJℕƛƴǑƛLJſŜǎ ǎŜú 2dzú ƛƴǑƘƖ·LJúŜℕ c℗ [ƛƎƘəƴƎ ǿƖ·ǎ LJℕ2LJ2ǎŜŘ úƨ ƛϒLJℕ2ǾŜ ǎƖ·ŦŜúè Ɩ·ú ƴƛƎƘú Ɩ·f2ƴƎ LJƖ·úƘǿƖ·èǎ Ɩ·ǎ ǿŜſſ Ɩ·ǎ Ɩ·ú LJſƖ·ǑŜǎ Ŧ2ℕ ƎƖ·úƘŜℕƛƴƎǎ℗ ¢ƘŜ ǑƘƖ·LJúŜℕ Ǒ2ƴǑfdzŘŜǎ ōè ǎdzōϒƛ ǩ ƴƎ úƘƖ·ú úƘŜ ŘŜǎƛƎƴ ǿƖ·ǎ Ɩ·ōfŜ úƨ ǎ2fǾŜ úƘŜ ƀ22Řƛƴ ǿƘǑK Ǒ2ƴãŜǑdzəǾŜfè Ɩ·ff2ǿŜŘ úƘŜ Ɩ·dzúƘ2ℕ úƨ ℕŜLJℕ2ƎℕƖ·ϒ úƘŜ ℕŜǎdzfəƴƎ 2LJŜƴ˙ǎLJƖ·ǑŜǎ Ɩ·ō2ǾŜ úƘŜ ƀ22ŘƛƴŜǎ ŜǾŜƴú ǎLJƖ·ǑŜǎΣ LJſƖ·è Ɩ·ℕŜƖ·ǎ Ɩ·ƴŘ ϒƖ·ℕ℩Ŝú Ŧ2ℕ LJdzōfƛǑ dzǎŜ℗ ¢ƘŜ ƛƴúŜℕǾŜƴ2ƴã LJℕ2LJ2ǎŜŘ Ɩ·ǎLJƛℕŜ úƨ ōdzƛfŘ úƘƛǎ ƴŜƛƎƘŌ2dzℕƘ22Ř ƛƴú2 Ɩ· ǎdzǎúƖ·ƛƴƖ·ōfŜ Ǒ2ϒϒdzƴúè úƘƖ·ú Ǒƚ·ƴ LJℕ2ŘdzǾŜ ƛúǎ 2ǿƴǾŜƎŜúƖ·ōfŜǎΣ ŜŘdzǑƚ·úŜ úƘŜ f2Ǒƚ·fã 2ƴ Ɩ·ƎℕƛǑdzfűdzℕŜΣ ǑℕŜƚ·úŜ ŜϒLJf2èϒŜƴú Ɩ·ƴŘ ϒƖ·ℕ℩Ŝüǎ Ŧ2ℕ 2úƘŜℕ ϒŜϒōŜℕă 2Ŧ úƘŜ Ǒ2ϒϒdzƴúè Ɩ·ǎ ǿŜſſ Ɩ·ǎ ℕŜƘƖ·ōƛf úƚ·úŜ úƘŜ ℕƛØŜℕ ŜŘƎŜ ú2 Ŝyãdzℕ úƘƖ·ú LJŜ2LJſŜ ú2 f℅ØŜ ƛƴ˙Ɩ·ǑfŜƚ·ƴ˙Ɩ·ƴŘ ƘŜƚ·úƘè ŜyØƛℕ2yϒŜƴú℗

CHAPTER

10

CONCLUSION

This study attempted to address the issue of fragmentation caused by the neglected river system bisecting Mamelodi. The author noted the lack of positive contribution by Pienaar's River to a safer, cleaner and productive environment that could possibly link and unite the community of Mamelodi. The significance of this study is nestled in the historical meaning of rivers in being a thread that connects communities and inspire activities that add to a sense of togetherness. This study therefore explored the re/claiming and use of a river not only as a functional space but also as a traditionally and/or spiritually enriching place. The hypothesis for this study stated that the reclaiming of the river edge in Mamelodi as urban space can inspire meaningful, healthy and productive human environments. It suggested that by respecting the spirit, identity, values and cultural practices of an area, a landscape intervention can add to a shared sense of community.

The study put more emphasis on the natural setting, interpretation and meaning, users and site activities as well as photographs and drawings to better understand the site and inform design. Precedents and case studies assisted the author to determine a list of design principles; community design, safety, connection and linkage, integration of uses, robustness and sustainability, to be applied in the design of the focus site was to follow. A theoretical study on community design explored the creation of a sense of community, place making and how the two can create community places. In designing these places, the author established a normative position based on the use of a meaningful design that highlights local values and ideas about nature, site, identity and the interaction between people and their environment. The landscape is seen as perceived settings that frame people's senses of place and community. This project aims to highlight these settings (Stewart & Strathern in Muller, 2009: 34). Other theories, concepts and themes like greenways and urban design were explored in the development a local framework. The author introduced and dealt with the context at four different scales that resulted in different proposals that together form part of a systemic environment whereby one affects the other:

- Study area: how Pienaar's River sits in the larger Mamelodi Township. The study presented rehabilitation guidelines for the river system while introducing new uses that will bring people to this space by using the concept of greenways. The catchment management plan proposed sustainable strategies for the rehabilitation of the river system by introducing wetlands and vegetation to manage excess floodwater, clean stormwater and nurture wildlife habitats. A cross-country track going along Pienaar's River linking Eerste Fabrieke and HM Pitje Stadium was proposed while other pedestrian orientated pathways lined with street planting link the community to the river and Mamelodi West to Mamelodi East.
- Framework area: how the northern end of the river relates to other community spaces and facilities. A local framework was designed concentrating on community nodes, cultural heritage and the ecological aspects of the area. It also employed the use of urban design planning elements from Kevin Lynch's book, *The Image of the City* (Lynch: 1960), to develop some hierarchy and identity for the area.
- Masterplan area: how the park area fits and relate to its immediate context.

The masterplan presented systems that makeup the park: activity nodes, access and circulation, urban agriculture as well as water and open space systems. Urban agriculture was introduced as a possible solution for the economical development of the community. These are seen as elements of a community building landscape which according to Hall and Porterfield (2001: 19),'s community design theory, can be perceived as positive, productive, planned, and functionally supportive spaces. The project presented the river as meaningful and active place with smaller outdoor rooms for social activities and play.

- Focus Site: how the detail design area fits into the Masterplan. According to Hall and Porterfield (2001: 19), if the viewer can perceive open space as a part of a larger composition, one that heightens the relationship of the other elements in that composition, then that space has been successfully designed. Given this, the author successfully presented the pilot project as the engine that's inspires the spirit of togetherness by bringing together communities on both sides to the river and across the river to an node comprised of multiple socio-economic activities, multifunctional public facilities in spaces that respect both the historical and ecological fabric. Safety of the space has been improved by ensuring visibility during the day and at night when the area is lit up.

The study has also attempted to prove that meaningful community design can provide insights on pathways to sustainability acceptable communities. The choice of sustainable materials is correlated with their significance in community life whether it's the choice of medicinal plants or recycling materials in the landscape in a way that will be educational to the users.

Practical implications of this study are influenced by and depend on the special characteristics of different sites or areas along the river system. Although most of the activities proposed are general, finding the 'perfect' site to match them and the community needs has been a daunting exercise. There are limitations that could affect application of this project mostly due to the fact that the river system has been used as the main channel for servitudes. The author acknowledges that the information collected was limited to only a few sources. Legislation could also be a major hurdle in the project but the study assumed that the interventions would be approved.

The topic of community design and the relationship between the creation of a sense of community and landscape design still needs to be investigated further. The disappearing (historical) meaning of rivers (and other natural settings) to a society that results in neglected and hazardous spaces needs to be recaptured. Folk culture could provide a starting point for this but blindly copying and unfamiliar elements into peoples' places could lead to further disregard. Sometimes what people need is a comfortable and pleasurable place to work, play, learn and live. It seems then that by respecting the history, culture and tradition associated with a place and designing enjoyable spaces that encourage socialisation could lead to meaningful community places that people can feel proud of and own up, becoming a part of their daily lives, and have an attachment to, seeing themselves in nature and nature in them.

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