

# CULTIVATING THE CITY

**A Multifunctional Landscape Along the Walker Spruit, Pretoria**

**By Dominique Rossi, 2012**



# **CULTIVATING THE CITY**

## **A Multifunctional Landscape along the Walkerspruit, Pretoria**

**By Dominique Rossi**  
**27133215**

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**in the Department of Architecture, Faculty of Engineering, Built Environment and Information Technology**

**at the UNIVERSITY OF PRETORIA South Africa**

**Study Leader: Ida Breed**  
**Studio Masters: Jacques Laubscher (Dr.) & Arthur Barker (Dr.)**

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## **ABSTRACT**

*The purpose of this dissertation was to explore how a landscape architect may help to address environmental decay and the threat of food scarcity that are the results of rapid urban growth. For this urban renewal scheme, it is proposed that the underutilized open spaces within the city are reclaimed and interconnected in order to maximize their potential, forming a continuous landscape network. It is believed that this landscape network needs to function beyond mere beautification in order to be successful and productive. A multifunctional strategy is thus brought forward, as emphasis is placed upon providing for food security and realizing the city's wasted resources. Along with related economic and ecological advantages, ways in which open space may be more sustainably managed are explored.*

*Acknowledging the sheer lack of municipal funds, community involvement is believed to be the catalyst of this vision. Surrounding neighbourhoods are hence proposed to be the maintainers of their surrounding open spaces, decreasing the monetary pressures on the authorities. Emphasis is placed on ways in which communities may be incorporated through designing for flexibility, pride of ownership and sense of belonging. A new identity that ties in with the original genius of place is ultimately promoted through this meaningful utility parkland.*

*An abandoned stretch of land along the Walker Spruit between Pretoria's Sunnyside East and Clydesdale suburbs served as a model for testing the hypothesis of a spatially continuous, linear and productive community park.*

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 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 bibliography.

Dominique Rossi

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**‘No branch can bear fruit by itself’  
John 15:4**

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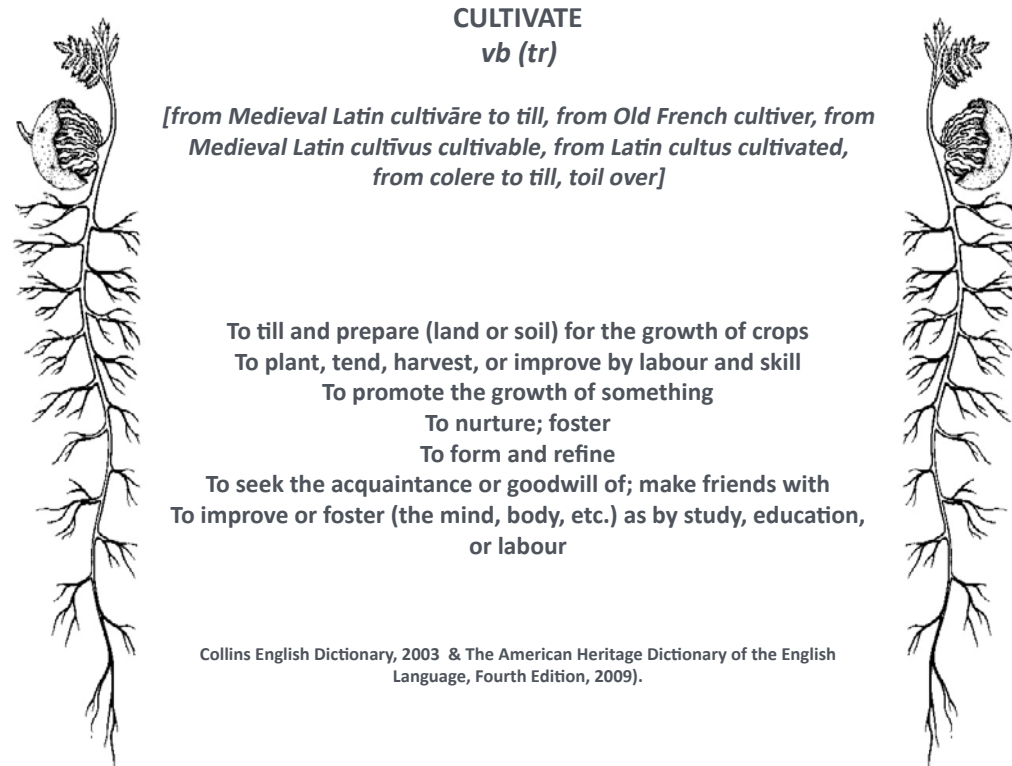
## DEFINITION OF TERMS:

### Urban Agriculture:

'Urban agriculture can be defined shortly as the growing of plants and the raising of animals within and around cities. The most striking feature of urban agriculture, which distinguishes it from rural agriculture, is that it is integrated into the urban economic and ecological system: urban agriculture is embedded in -and interacting with- the urban ecosystem. Such linkages include the use of urban residents as labourers, use of typical urban resources (like organic waste as compost and urban wastewater for irrigation), direct links with urban consumers, direct impacts on urban ecology (positive and negative), being part of the urban food system, competing for land with other urban functions, being influenced by urban policies and plans, etc. Urban agriculture is not a relic of the past that will fade away (urban agriculture increases when the city grows) nor brought to the city by rural immigrants that will lose their rural habits over time. It is an integral part of the urban system' (RUAF Foundation, 2012).

### Open Space Network:

A conceptualization of interconnected open space that accommodates human and natural ecologies, systems and processes developed to spatially manifest the Open Space vision (TSOF, 2006:iv).





**GENESIS 2:8.**

*And the LORD God planted a garden in Eden, in the east, and there he put the man whom he had formed. And out of the ground the LORD God made to spring up every tree that is pleasant to the sight and good for food...*



# INTRODUCTION

Illustration 1: Guerilla Gardening in the cracks of city paving (From: <http://kaleidoscopelife coaching.com/2012/01/on-the-twelfth-day-of-christmas/>)

## INTRODUCTION

### BACKGROUND AND CONTEXT

On October 12th, 1999 the international community observed the 'Day of the Six Billion.' The population of our planet was only 2.5 billion in 1950 and is expected to be 8.9 billion in 2050 (Drescher, 2001:3). Between 1995 and 2005, the urban population of developing countries grew by an average of 1.2 million people per week, or around 165 000 people every day (WHO, 2010). The world is thus rapidly urbanizing with significant changes in our living standards, lifestyles, social behaviour and health. These factors give rise to two major concerns: the feeding of the growing population and the environmental degradation associated with these densities.

Figure 1 indicates the population percentage of the urban versus the rural density in 1950, 2011 and the estimated projection in 2050. This indicates rapid urban growth as increasing populations move out of the countryside and further into the growing city. Consequently, as the sprawling city encroaches further into the countryside, vacant land, on the other hand, created by uncompleted urban renewal and the abandonment of city core areas, permeates the urban landscape and contributes to social deterioration. While this lost space lies idle and unproductive within the city, parks departments struggle to provide designated parks with adequate acquisition, maintenance and development budgets.

According to Hough (1984:213), we face a future of increasing energy shortage that will eventually bring about a greater concern for conservation in urban life and the way land is used. As environmental and energy issues assume a higher profile in the future, it will become increasingly necessary to widen the horizons of urban design to meet new goals. Urban open space should be held responsible to shoulder environmental, productive and social roles, as vital components of the urban design process, eventually overshadowing conventional park functions and civic values.

What's more, food security in the urban context is considered a major problem which is often not recognized. Defined as 'physical, social, and economical access to sufficient, safe and nutritious food by all South Africans at all times for a healthy and active life' (RSA Integrated Food Security Strategy: 2002:6), it has been found that approximately 14 million people or 35% of the total South African population was considered to be vulnerable to food insecurity in 2004.

The environmental dilemma associated with rapid urban growth thus signifies a new era associated with the rising costs of food and energy, along with the recognition that fossil fuels cannot last forever. Mbiba (2005:193) states that food security and poverty are becoming the key subjects of interest in South Africa and other developing countries.

In order to face the challenges sketched out above, this dissertation promotes the use of available land in the city as a productive resource. It will attempt to identify the possibilities of re-establishing constructive links with the land and the natural processes that are tied to the food we eat, leading to the promotion of a new urban ecology.

### Research Question and Problem Statement

How can landscape architecture help to address environmental decay and the threat of food scarcity as consequences of rapid urban growth in the developing world?

### Hypothesis

Reclaiming and interconnecting unutilized open space in the city will maximise its productive, multifunctional potential. This will increase the food security and social capital of urban communities as a new and self-sustaining urban ecology is promoted.

### Sub Questions

1. What are the threats and implications for urban open space of rapid urban growth in the developing world?
2. How can open space be reclaimed, connected and used as a resource?
3. What is a productive landscape and its benefits thereof?
4. What does the notion of social capital entail and how can it be initiated?

### Importance of the study

The problem statement is one that does not only apply to South Africa, but it is also a global issue. This dissertation promotes 21st century landscape architecture in its planning and sustainable design capabilities in addressing world issues.

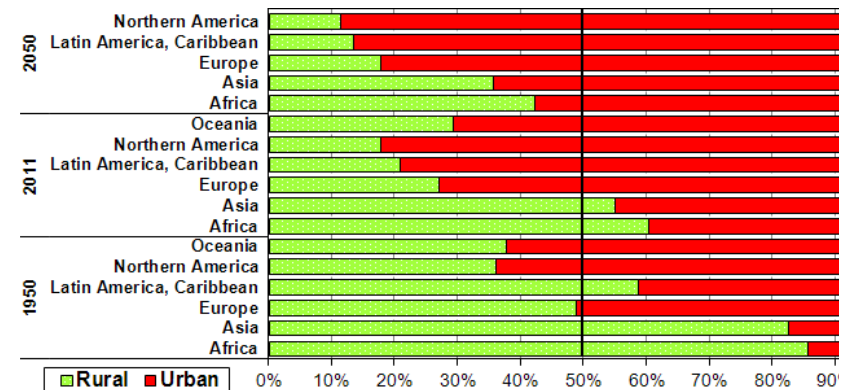


Illustration 2: Population percentage of urban versus rural density in 1950, 2011 and the estimated projection in 2050. (From: United Nations, Department of Economic and Social Affairs, Population Division: World Urbanization Prospects, the 2011 Revision).

## Research Goals

This dissertation aims to explore ways in which one may deal with urban renewal through the notion of a productive, multifunctional landscape. The solutions gained are aimed to be holistic, economically-viable and sustainable.

More specifically, to:

- Promote urban agriculture as an important aspect of the urban economy and quality of life in urban areas.
- Create opportunities which add value and enhance existing natural capital.
- Establish a strong sense of community identity and pride of ownership.
- Improve continuity and accessibility of recreation facilities and to create an opportunity whereby inner city tourists and residents can experience a collection of productive open space, recreation and cultural amenities.

## Assumptions and Delimitations

- All the decisions made by the author are based on current physical and social conditions within the site and its surrounding context.
- It is assumed that the existing frameworks involving the site will be approved by council. These will be incorporated by the author as far as possible but will not limit the application of design ideas as expressed in this dissertation.
- The City of Tshwane Metropolitan Municipality will be responsible for the implementation of this proposal.

## Research Methodology

The idea of urban renewal will be approached through the proposed methodology of a tripartite relationship between:

### 1). Reclaiming the landscape:

This dissertation proposes that the underutilized open spaces within the city are reclaimed and recovered. It is believed that their potential as valuable resources can be increased through their interconnection in order to form a continuous landscape network. The landscape thus becomes the new infrastructure of the city, which may decrease the threat of urban sprawl through attracting people back to the centre.

### 2). The multifunctional landscape:

This landscape network needs to possess values beyond mere beautification in order to be successful and productive. A multifunctional strategy is thus brought forward. This includes the notion of promoting food security through urban agriculture and realizing the city's wasted resources. Related economic and ecological advantages are hence brought into the foreground and enrich much-needed recreational space. Open space

will therefore become more sustainably managed while a new aesthetic is ultimately promoted through this new type of utility parkland.

### 3). Building Social Capital:

Acknowledging the sheer lack of municipal funds, community involvement is thus believed to be the catalyst of this vision. Surrounding neighbourhoods are hence proposed to be the maintainers of their surrounding open space, decreasing the monetary pressures on the authorities. Involving adjacent communities initiates pride of ownership and a sense of belonging, making the design intervention all the more meaningful. This dissertation looks at how this may be approached through designing for flexibility and ownership. It is believed that this strategy will create *genius loci* through the evolving 'people's places' that are continuously created and maintained.

This research methodology is summarized in *Illustration 3* below, and is further elaborated and explored in *Chapter 2: 'Theory,'* and the following design intervention in *Chapters 7 to 8.*

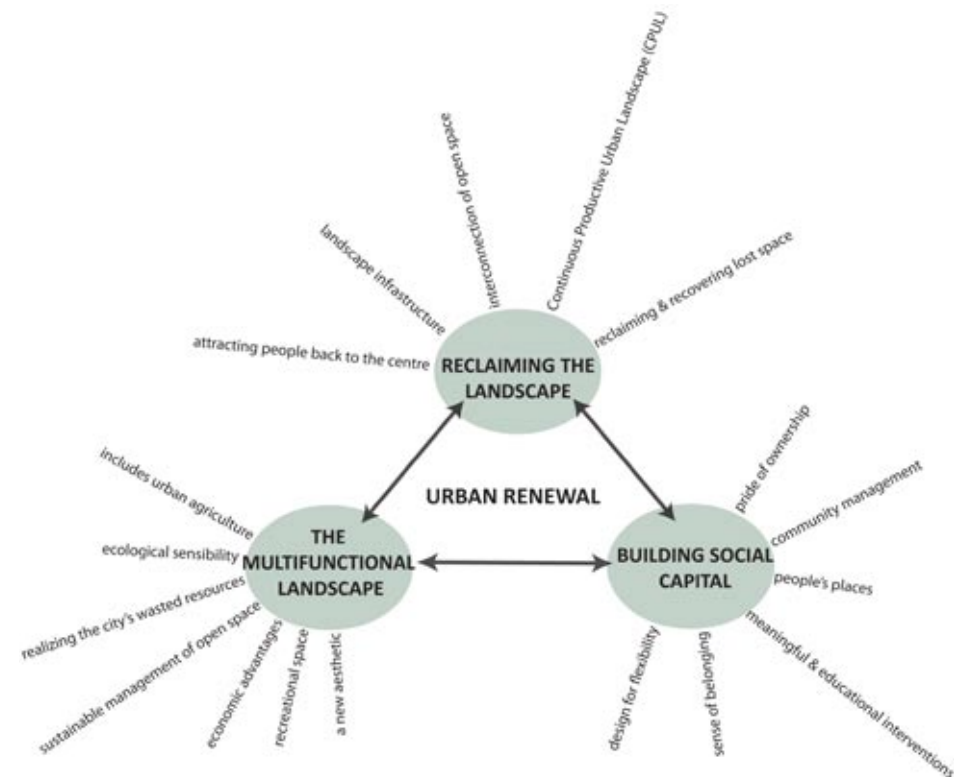


Illustration 3: Research methodology: proposed approach of facilitating urban renewal through the tripartite relationship between reclaiming the landscape, the multifunctional landscape, and through building social capital (Author, 2012).



**CHAPTER 1: INTRODUCTION**

**Research Methods:**

The following data collection has been used as a desktop study as part of the design process in order to gain an understanding between the relationship of the interconnection of open space and the multifunctional landscape. From this, design guidelines are established to inform the final design proposal.

**Literature research:**

- The effects of rapid urban growth
- Reclaiming the landscape in stitching together a continuous landscape
- The multifunctional landscape
- Building social capital

**Investigation of Precidents:**

- These are both existing and in theory.
- A case study has also been researched and visited.

**Site Analysis:**

- The specific site chosen for the purposes of this dissertation has been mapped and analysed in order to determine the inherent opportunities and constraints.

**Site Location**

The proposed site is an underutilized linear urban open space, located along the Walker Spruit (a tributary of the Apies River) in the city of Tshwane, Pretoria (see illustration 6). An identified focus area within the precinct has been selected for detail design as a pilot project. This lies between the high density residential suburb of Sunnyside East and the low density residential suburb of Clydesdale (see illustration 4). In regards to the overall framework, the vision of the landscape network will extend along the length of the Walker Spruit, Apies River and into the countryside; Onderstepoort Nature Reserve towards the north and Rietvlei Nature Reserve towards the south. This is the bigger picture and in broad scale (as seen in Chapter 6, 'Urban Framework').



Illustration 4: Immediate context of selected site, lying between the suburbs of Sunnyside East and Clydesdale (Author, 2012).



Illustration 5: Typical ambience of the underutilized, undermaintained site along the Walker Spruit (Author, March 2012)

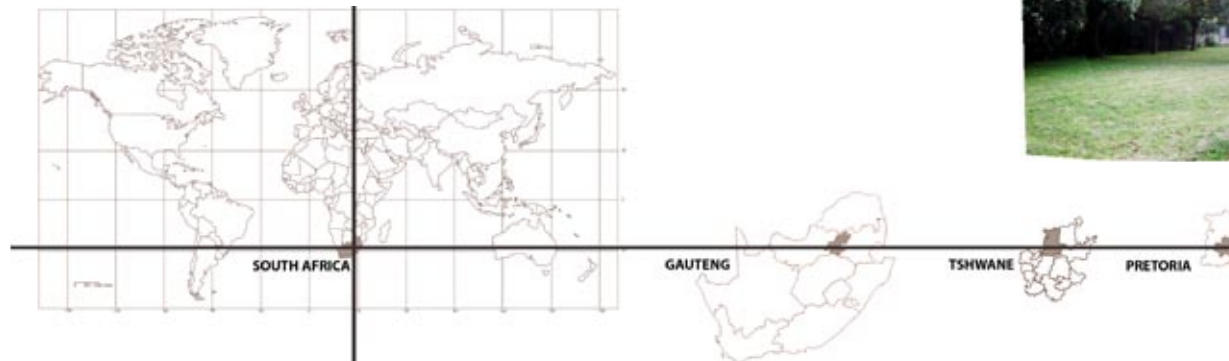


Illustration 6: World and Regional context of the selected site (Author, 2012).

## Potential Client profile

Numerous parties could be involved in this multifunctional, utility landscape, the main clients being:

- City of Tshwane Metropolitan Municipality (CTMM),
- Department of Agriculture
- CTMM parks division

With the assistance of Non-Governmental Organisations, such as:

- The Afristar Foundation

In collaboration with the existing community associations:

- Clydesdale Village Association
- Sunnyside East Residents and Ratepayers Association (SERRA)

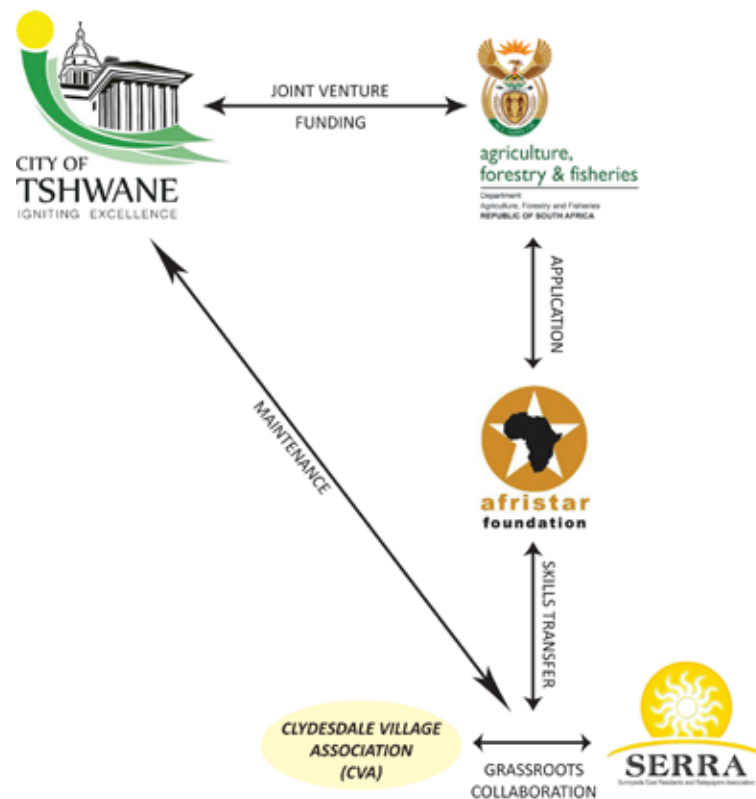


Illustration 7: Proposed relationship between client and funder (Author, 2012).

*'Anyone who has watched the still mysterious unfolding of a stalk of corn from a tiny and seemingly lifeless yellow seed, anyone who has calculated the awesome yield of food from a collection of pitiful potato sproutlings, will have some suspicion of the vast energies potent in every square metre of land, even in the midst of teeming asphalteries called cities.'*

*(Hough, 1984:vii).*



2

THEORY

Illustration 8: Guerilla Gardening activist, Toronto, Canada (From: <http://www.facebook.com/occupygardensforworldpeas#/occupygardensforworldpeas>)

# THEORY

## INTRODUCTION

The following theory explores ways of responding to the negative impacts of rapid urban growth for urban open space and how to address this through retrospective urban planning. This chapter thus explores the sub-questions of the research (see Chapter 1: 'Introduction'). The idea is to diagnose how a landscape architect may go about aiding this real world problem through informed design interventions.

The importance of a productive, multi-functional landscape and its relevance in the context of rapid urban growth will be discussed, paying particular attention to urban agriculture. This will be argued from a framework as well as a detail design point of view. The resultant community impact will also be discussed in terms of public participation and community management in the goal of facilitating the building of social capital. The discussion will assist in the determination of design guidelines and culminate in a personal design manifesto for the purposes of this dissertation.

### PART 1: CONTEXT: RAPID URBAN GROWTH

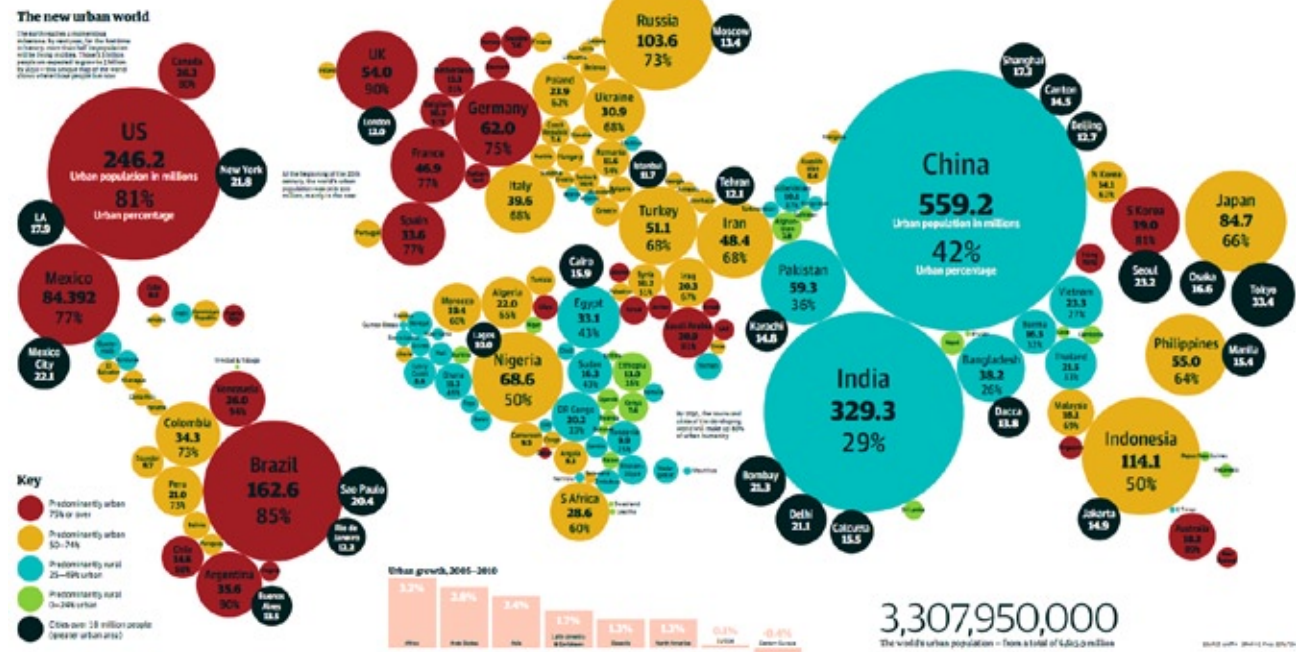
#### The Threats of Rapid Urban Growth

It is said that the explosive growth of urban areas worldwide over the next two decades poses significant risks to human populations and the global environment, from the loss of agricultural land and wildlife habitat, to increased vulnerability from the effects of climate change. Using satellite data on urban growth, a study has calculated that the world's total urban area quadrupled in size from 1970 to 2000 (Environment 360, 2012). Experts warn that with nine billion people expected to inhabit the world by 2050, food production in Africa alone must be tripled (Giyose, 2004). Urban hunger and hungry city dwellers are hence mounting problems. In addition, it has been stated that without strong adaptation measures, climate change could reduce food crop production by 10 to 20 percent by the 2050s, with more severe losses in Africa.

Over the past several decades, growth has leapfrogged beyond cities and older suburbs into many areas that were

once rural. In general, Benedict and MacMahon (2000:11) state that all too often, this is done without firm land-use plans in place to guide development. The result is urban sprawl. Certainly, this has also resulted from our growing dependence on the automobile. Additionally, human modifications of the land have created fragmented development patterns that threaten ecological functions and processes. It is also documented that ambient air pollution worsens as city populations grow (Dunn, 2010:47). In the case of South Africa, many of the people migrating to urban centres are economic refugees. In general, many people in search of work from rural areas gravitate to high density, low cost housing in an urban centre (for example, Sunnyside) or to informal settlements on the outskirts (DWAf, 2011). Driving forces include the opportunities and services offered in urban areas -especially jobs and education- while conflict, land degradation and exhaustion of natural resources are the common side-effects (UNEP 2000). This is also a large contributing factor to urban sprawl and increasing unemployment.

Based on the above growth projections -which are continuing at an unprecedented pace and intensity- one may conclude that the condition of the 21st century urban landscape is, indeed, in jeopardy. The long-term health of critical wildlife habitat, water resources, agriculture and forestry economies, and recreational areas are all at stake. This includes related social dilemmas. Finding ways to protect landscapes that are within a dense and encroaching urban area is thus becoming a pressing challenge.



Landscape architects thus need to find ways to create open places of restful solitude within the bustle and compactness of the urban area, all the while preserving habitat, maximizing public access and intensifying land use. The dual demands for both habitat protection and open space in response to increasingly crowded conditions thus need to be mollified.

### The Historic Growth Patterns and Urban Sprawl of the City of Tshwane

Urban sprawl within the context of the city of Tshwane has experienced the added dimension of racial segregation in terms of Apartheid. It also bears a historical palimpsest of its evolution from farmland to city. The following text from the Tshwane Open Space Framework document (Vol 1, 2005:20) summarises the growth of the city of Tshwane and the resultant status quo to date:

*Since its establishment in 1855, until the discovery of gold on the Witwatersrand in the 1880s, Pretoria had a rural town character. It was laid out in a Voortrekker grid pattern, benefitted and defined by a canal network which channeled the river to the large erven which stretched from street to street. (It is important to note that this dissertation's focus area lies between Sunnyside East and Clydesdale (see Chapter 3: 'Context'), serving*

as examples of this historical residential farmland).

*Until 1930 the majority of development took place within inner city areas, however, urban areas became more fragmented with the development of new 'white' residential areas and the establishment of dormitory townships for black people, such as Saulsville, Mamelodi, Eersterust and Laudium. As urban growth accelerated after 1960, the grid pattern of the city was rejected in favour of a curvilinear pattern, as vehicular modes of transport dominated over pedestrians.*

*The most rapid urban growth took place after 1990, during which period the metropolitan population doubled from 890 000 to 1,76 million. Between 1991 and 1995 the metropolitan area's population grew at an alarming rate of 14,6% per annum. This high growth came in the wake of the abolition of apartheid legislation that previously restricted the migration of black people into the urban areas. At the same time, rapid high and middle income suburban development took place, especially on the south-eastern periphery, disregarding the strong natural structure of the city by building on the ridges and canalising rivers and streams (see Chapter 4: 'Site Analysis,' for the effects of the canalisation of the Walker Spruit).*

*The latter part of the 1990's saw the inner city decay prompted by the flight of capital to new growth centres in the south-east. Large shopping malls and business centres developed further away from the inner city, giving the urban area a multi-nodal character. However, the early 2000s saw more people moving into the inner city, occupying vacant office buildings and overcrowding existing apartment buildings. This phenomenon highlighted the lack of sufficient open spaces within the inner city (TSOF vol 1, 2005:18-21).*

One may therefore conclude from the preceding text that in the context of Tshwane, a palimpsest of historical layers occurs out of the city's growth from the rural to the urbanized. In order to address the lack of sufficient open space within the inner city (TSOF vol 1, 2005:21), the left over, fragmented space resulting from rapid urban growth and the spatial segregation of Apartheid needs to be addressed. Moreover, the vehicular domination of the city also needs to be addressed through encouraging and defining more pedestrian access. The lost space of Tshwane thus needs to be reclaimed and integrated back into the city and seen as an opportunity for urban rejuvenation. A way in which this integration and pedestrian encouragement could be approached is through the notions of green infrastructure and the *continuous landscape*, to be discussed in Part 2.

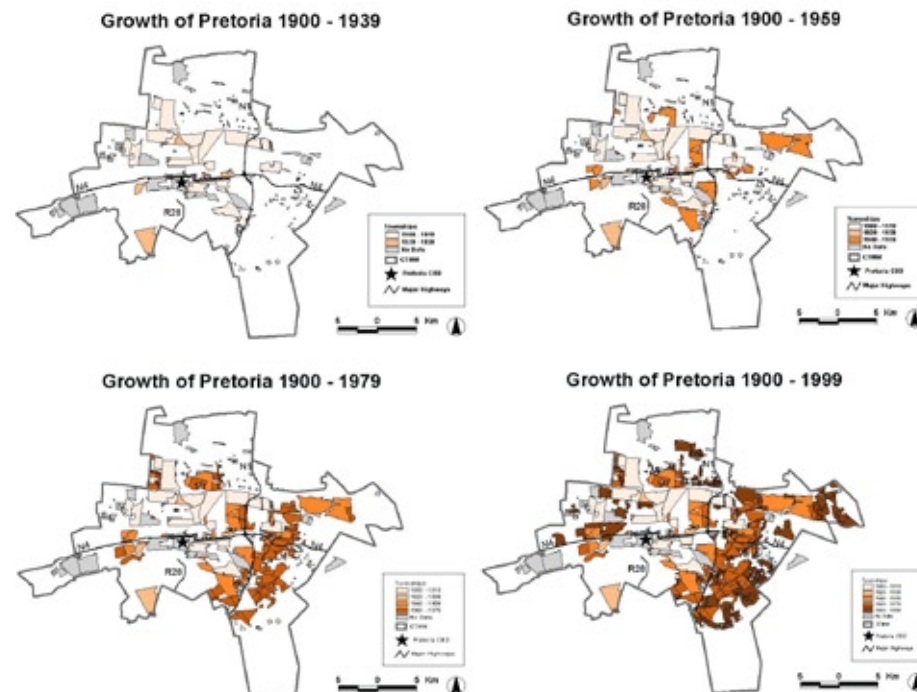


Illustration 10: Series of maps showing the growth of Pretoria between 1900-1999 (TOSF vol 1 2005:20)

## PART 2: THE CONTINUOUS LANDSCAPE

*'A connected system of parks and parkways is manifestly far more complete and useful than a series of isolated parks' John Olmstead and Frederick Law Olmsted Jr, 1903.*

### The Lost Spaces of the City

Generally speaking, lost spaces are the undesirable urban areas that are in need of re-design: 'antispaces,' making no positive contribution to the surroundings or users. Trancik (1986:19) enforces that in urban design, the emphasis should be on the groups and sequences of outdoor rooms of the district as a whole, rather than on the individual space as an isolated entity. Therefore lost space should not be viewed in isolation, but as a collective whole in order for reclamation and productivity to be optimal. Hough (1984:253) emphasizes, hence, that the problem in urban environments is thus not currently shortage, but effective use of land. This is exactly what the notion of Green Infrastructure seeks to achieve.

### The Notion of Green Infrastructure (GI)

The notion of continuous open space is also an important environmental factor. The Tshwane Open Space Framework (TSOF, vol 2, 2006:17) states that the linking of open spaces allows for the creation of ecological corridors.<sup>1</sup> Linkages between open spaces also help to define the landscape or city structure, provide links with the natural environment, while allowing for ease of movement for residents through connecting pedestrian and cycling trails. Furthermore, according to Benedict & MacMahon (2001:14), well planned green space has also been shown to increase property values and decrease the costs of public infrastructure and services.

In the field of Landscape Architecture, there has been a rapid increase nationwide in the use of the term 'Green Infrastructure' and the application of its concepts and values in meeting today's conservation and land use challenges. According to Kambites & Owen (2006), Green Infrastructure is a connected network of multifunctional, predominantly un-built space that supports both ecological processes and social activities. In the long term, Green Infrastructure provides a framework for integrating diverse natural resource and growth management activities in a holistic, ecosystem-based approach (Benedict & MacMahon, 2001:16). Furthermore, this theory identifies opportunities for the restoration, reclamation and enhancement of open space in already developed

<sup>1</sup> According to Jongman and Kamphorst (2002:12), an ecological corridor is defined by three main aspects: (1) an arrangement of habitats that enhances the movement of animals or the continuity of ecological processes through the landscape, (2) a general term for a linkage that increases connectivity at a landscape or regional scale, (3) a linear strip of vegetation that provides a continuous pathway between habitats.



Illustration 11: An example of a recent Green Infrastructural project: Vision of the urban village, 'Via Verde' (the 'Green Way') designed around rooftop community parks in New York City. In this case, rooftops in the city were viewed as 'lost space' (From: Jonathan Rose Companies, 2007).

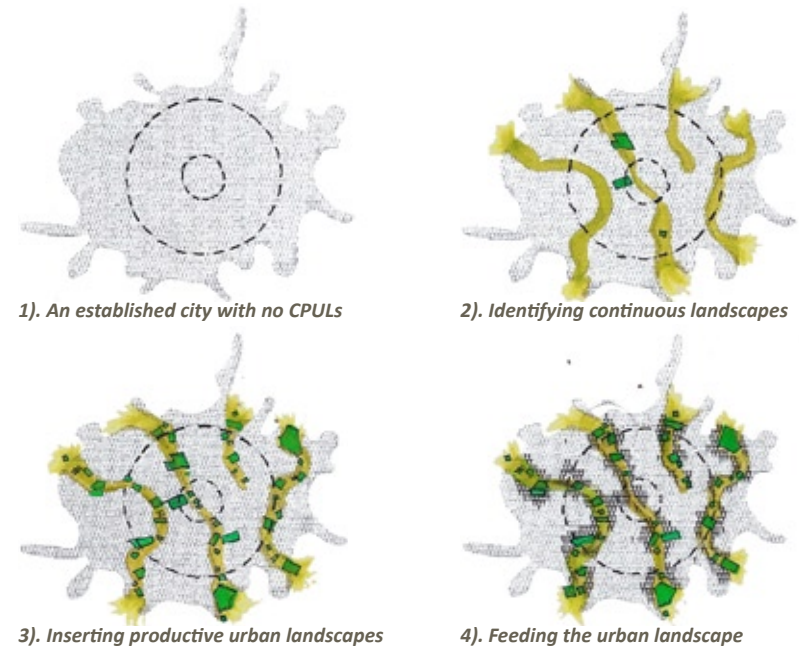


Illustration 12: Creating a CPUL as an urban design strategy (From: Bohn & Viljoen, 2005:13, manipulated by Author, 2012).



Illustration 13: Photo-collage indicating how CPULs may be integrated with footpaths, cycle networks and market garden infrastructural intensification (From: Bohn & Viljoen, 2005:293)

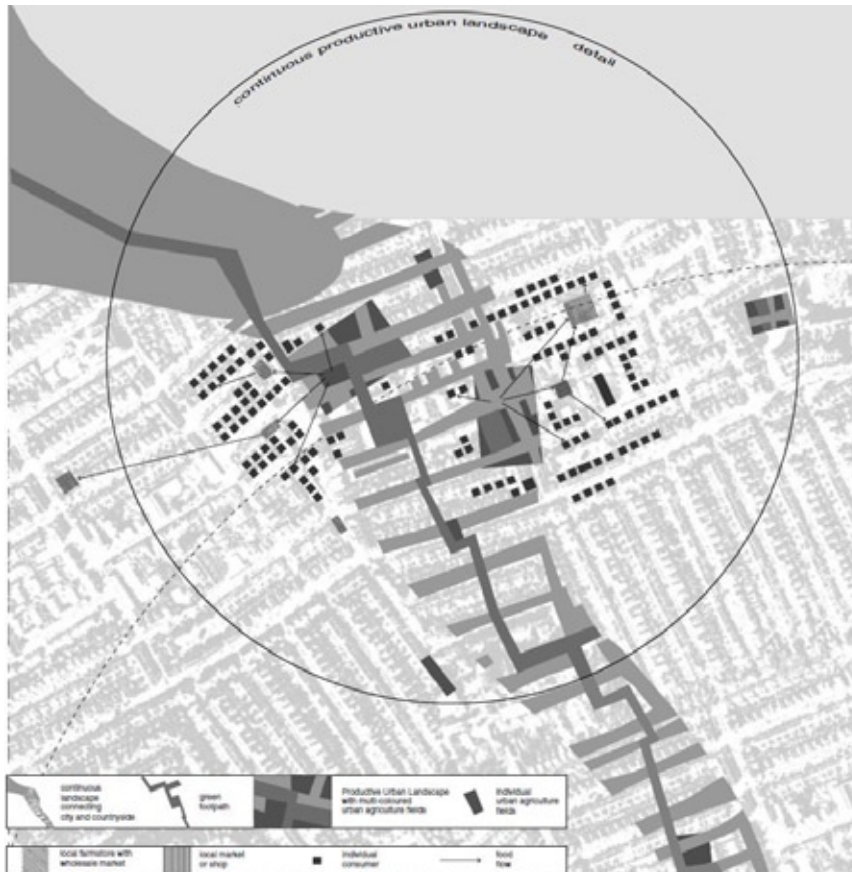


Illustration 14: CPUL detail (From: Bohn & Viljoen, 2005:14)

areas. Simultaneously, a broad unifying vision is provided for the future.

Thus, in the wake of the overpopulation, urban sprawl and environmental crisis, the idea of Green Infrastructure is extremely relevant. Richard Weller (cited in Waldheim 2006:11) accordingly states, 'the landscape itself is a medium through which all ecological transactions must pass: it is *the* infrastructure of the future.' The Green Infrastructural components covered by this dissertation are explored through the notion of a multi-functional landscape, with a particular focus on urban agriculture and Continuous Productive Urban Landscapes (CPULs), as described below. This dissertation is thus in strong support of the recovery of lost space, and the argument that open space may be seen as having value beyond the recreational and aesthetic purposes generally ascribed to it (Hough, 1984:216).

### The Continuous Productive Urban Landscape (CPUL)

Building on the notion of Green Infrastructure as discussed above, architects Bohn and Viljoen (2005) cite the idea that the structure of our cities could be changed for the better by overlaying productive urban landscapes with the concept of continuous landscapes. Viljoen (2005:xvii), defines a Productive Landscape as an open urban space planted and managed in such a way as to be environmentally and economically productive in its capacity to provide food from urban agriculture, whilst increasing biodiversity. This is associated with a multi-functional landscape as discussed below. The idea is that the Continuous Landscape and the Productive Landscape together result in a 'Continuous Productive Urban Landscape' (CPUL, pronounced '*See Pull*'), which is productive in economic, social cultural and environmental terms. This is placed within an incremental urban-scale landscape strategy and does not yet exist in cities.

Therefore, most uniquely, the CPUL allows space for urban agriculture within the resultant urban green lungs of the city. In this way urban parks could become wilder and healthier by allocating parts for urban agriculture. Productive urban landscapes may consist of many small fields covering an extensive area, or of isolated patches of horticulture set far apart, or of large individual fields. Fingers of productive landscape may link, like bridges, associated but physically isolated activities and areas of the city. Any one piece of land supporting urban agriculture may vary in size from several square metres in area to several hectares (Bohn & Viljoen, 2005:240).

Furthermore, CPULs are proposed to be multi-functional in that they combine the tranquil qualities of a park with physical activities. They are as likely to be occupied by someone seeking a place to rest and read, as by someone else wanting physical exercise (Bohn & Viljoen, 2005:252). The continuous landscape can additionally provide habitat for animals and birds, increasing biodiversity (Bohn & Viljoen, 2005:262).

## CHAPTER 2: THEORY

It is stated that the resultant continuous landscape of reclaimed fragmented lost space provides opportunity for the integration of urban routes, enhancing the significance of individual open space within any urban network. The chosen focus area for this dissertation historically had this intention. The Kerneels Young Hiking Trail (see *Chapter 3: 'Context'*) is an existing urban trail running through the site along the Walker Spruit, beginning at the origin of the Spruit in the suburb of Brooklyn and terminating at the confluence of the Walker Spruit and the Apies River near the city centre. This offers tremendous potential to be extended through the city along the Apies River as proposed in *Chapter 6: 'Urban Framework.'* Sustainable forms of travel, through pedestrian and cycling trails may thus become an important connecting component for the reclaimed open space of Tshwane. Bohn and Viljoen (2005:110) enforce, 'to be able to walk continuously onwards from an open urban space extends the space beyond itself and into a very fine and slow layer of inner-city movement. The potential for such movement encourages occupation and occupants as well as shaping the form and layout of open urban space.' Successful examples of such landscapes are New York's High Line, as seen in *illustration 15* and Milan's 'Green Plan,' as seen in *illustration 17*.

The potential of such pathways are further highlighted and given added dynamic through a CPUL intervention. As they connect private and public space, movement is encouraged between the two whilst acting as interventions which mark and reveal. Routes to shops become adjacent to places where food is grown. Each walk amongst the crops heightens the experience of seasonality, and speeds up time because of the compact space within which nature is experienced (Bohn & Viljoen, 2005:244). One may therefore deduce that the use of pedestrian and cycling pathways to connect the continuous landscape not only invites more citizens into the space, but also encourages a healthier form of travel as individuals are reconnected to the cycles of nature, while passive surveillance is simultaneously provided by keeping the linear, productive park busy through movement.

### Conclusion 1:

The effects of urban sprawl may be improved through the reclaiming and recovering of lost space in the city. The notion of Green Infrastructure helps to facilitate this process as open space is given preference for the planning of the urban environment. Overlaying the notion of Continuous Productive Urban Landscapes (CPULs) with Green Infrastructure allows for the provision of food from urban agriculture as a new type of landscape is created. The interconnection of this open space maximises its potential as a productive landscape, whilst simultaneously providing for ecological corridors. The provision of pedestrian and cycling pathways assists in stitching this landscape network together. These development strategies not only restore and rejuvenate the urban ecology whilst providing food security, but may provide the impetus to attract people back to the center.

It has been deduced that a continuous landscape should be assembled in incremental stages, as a series of small interventions eventually lead to an extensive network of connected spaces within the city grid. The connected space consists of existing parks, whether utilized or not, that are attached to lost space within the city. The specific focus area of this dissertation along the Walker Spruit in Pretoria is an underutilized green-field (see *Chapter 4: 'Site Analysis'*) and will serve as a pilot project and catalyst area for the ultimate CPUL vision for Tshwane (*further elaborated in Chapter 6, 'Framework'*). The focus area will thus become a catalytic 'hub' of urban agricultural and community park interventions, linked together by the revamping and eventual extension of the Kerneels Young Hiking Trail.



Illustration 15: The High Line, Manhattan, New York. A continuous pedestrian landscape in the city by James Corner Field Operations (From: <http://halls-garden.blogspot.com/2010/08/high-line.html>)

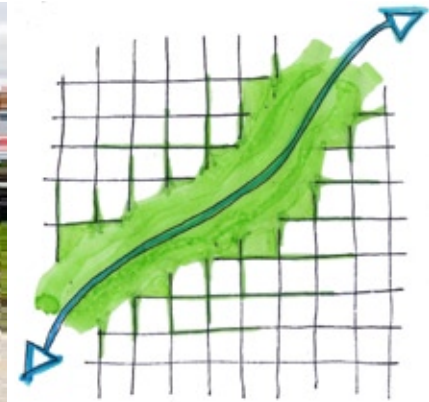


Illustration 16: Sketch indicating the design strategy, using the Walker Spruit as a green infrastructural spine within the city grid (Author, 2012)

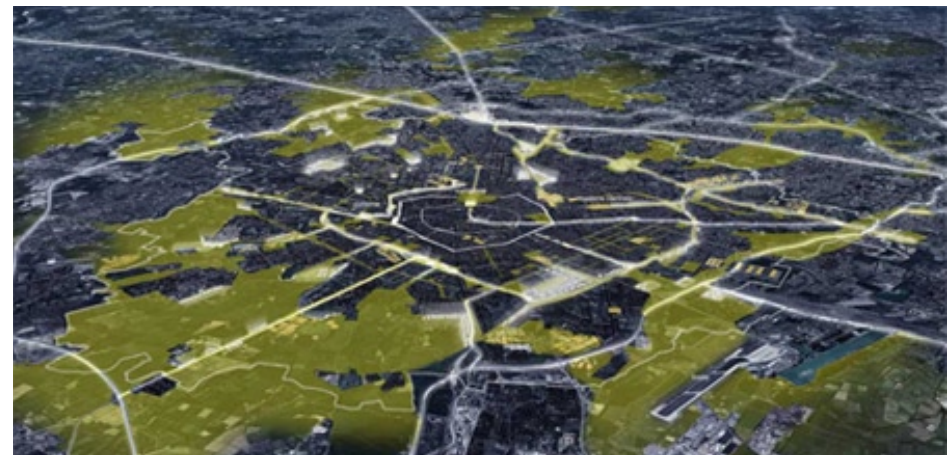


Illustration 17: The Milan 'Green Plan,' a network of connected open spaces connected by 72 km of pedestrian and cycling routes (From: <http://www.cudc.kent.edu/blog/?tag=landscape-architecture>)





Illustration 18: Campaign poster for World War II Victory Gardens by artist Joe Wirtheim (From: <http://www.patheos.com/blogs/paganswithdisabilities/2011/06/victory-gardens/>)

### PART 3: THE MULTI-FUNCTIONAL LANDSCAPE

*'As environment and energy issues assume a higher profile in the future, it will become increasingly necessary to widen the horizons of urban design to meet new goals. Urban land as a whole will be required to assume environmental, productive and social roles, as fundamental components of the urban design process, far outweighing traditional park functions and civic values' (Hough, 1984:26).*

While leisure and beautification are the conventional functions of urban parks, there are other environmental and productive (rural) functions that the city's land resources should serve which have been largely forgotten. This is where the notion of a multi-functional landscape comes in to play. Demanding more from the land in a sustainable way, a multi-functional landscape is a combined utility, recreational and ecological landscape which is maintained by the cycles of nature and the benefitted community which runs it. Multifunctional landscapes thus allow for richer, more diverse and more useful urban places that make the most of available resources, as land use is intensified.

In the context of the Walker Spruit focus area, this type of revitalization can apply to a wide variety of objectives. First and foremost, in addressing the concern of food security in a saturated urban environment, components of urban agriculture as an important urban space type will be studied. The possibility of the city's wastes becoming potential resources will be examined, while the ecological benefits of specific cultivation methods and tree canopies will be disclosed. The landscape architect's role in designing for allotments will also be explored, while restoring the natural assets of the city such as waterbodies will be discussed. Social and economic functions of the landscape will be further elaborated in *Part 4*. Intensifying the land use and of the area provides for optimal occupancy of the site throughout the day, as different activities for the diverse citizen demographics are meaningfully provided for.

#### Urban Agriculture as an Important Urban Space Type

Hough (1984:226) proclaims that urban agriculture will increasingly become a necessary function of open space to which urban design should be addressed. Viewing the open space of the city as a potentially valuable economic service (Dewar & Uytenboogaardt, 1995:54), creating jobs through urban agriculture makes way for a remarkable provision to the community. It is said that the potential jobs created through urban agriculture are one full time job every 20-50 urban consumer, while the movement employs 800 million urban residents worldwide (Drescher 2001:41).

Urban gardeners have been shown to obtain forty to sixty percent of their household food from their gardens (Dunn, 2010:53). An example of this success is the *Abalimi Bezekhaya* ("Farmers of the Home") non-profit development organisation. Based in Cape

**CHAPTER 2: THEORY**

Town, township communities such as Khayelitsha, residents are encouraged and supported to grow their own organic vegetables to feed their families. Vegetables are now grown in hundreds of gardens in the townships, sustaining thousands of individuals and families. Some of the micro-farmers are producing more than enough to feed their families, even after giving to needy neighbours and selling ‘over the fence.’ Abalimi’s Harvest of Hope marketing project thus provides a much-needed outlet for excess produce by selling this produce on behalf of the farmers in the form of a weekly organic box scheme to customers of the general public. The urban agricultural project in this case has exceeded beyond providing a sense of food security; it has generated a sustainable business partnership.

One may therefore conclude that apart from income generation through on-site facilities, the economic return from ground-use should be considered as a major factor in judging the long-lasting success of urban open space. It may be added that community gardens can also be viewed as self-sustaining recreational space, becoming particularly relevant in situations where finance to maintain public open space is not available (Dewar & Uytendooft, 1995:54). Urban agriculture should thus be actively planned for and accommodated in urban design, planning and management, whilst it provides a unique and highly relevant niche to the field of landscape architecture.

**Seeing Waste as a Resource**

Urban writer and activist Jane Jacobs predicted that the future city will assume the role as supplier and consumer of resources, as the city’s used or unwanted materials, its heat energy, garbage, stormwater and vacant lands, become useful resources at less environmental and economic cost, when the right linkages are established (Jacobs, 1970). Urban agriculture thus comes to the foreground as a valuable dimension of a multi-functional landscape which exploits the city’s wasted resources for productive means. It allows waste to be viewed as a resource as explored below:

- Stormwater, being rapidly conveyed out of the city during a rainstorm is a resource which is wasted beyond measure, as it holds vast potential for sustainable landscapes. Harvesting this provides opportunity for the sustenance of urban farming. What’s more, stormwater retained in the city’s open spaces will contribute to the restoration of the hydrological balance as nature’s processes are brought closer to everyday urban life (Hough, 1984:108). In a water-scarce country, the harvesting of stormwater for re-use is thus a vital contribution for the modern landscape architect and makes the notion of urban agriculture all the more viable. Furthermore, the promotion of infiltration through the use of permeable paving where possible allows for the recharging of groundwater.
- The opportunity for the recycling of the domestic waste of the city is sporadic,



Illustration 19: Photograph of the successful women of Abalimi Bezekhaya (“Farmers of the Home”) weekly organic box scheme in the township of Khayelitsha, Western Cape (From: www.harvestofhope.co.za, 2012).

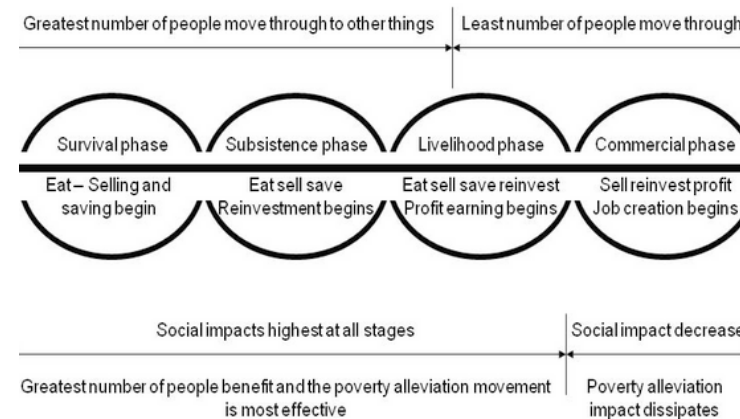


Illustration 20: Diagram indicating a chain of progression from poverty to food security alleviated through urban agriculture (From: www.harvestofhope.co.za/ 2012/04/sustainablechain)



Illustration 21: An image that promotes the recycling of organic waste (From: http://www.facebook.com/occupygardensforworldpeas#!)

and its potential as a resource is yet to be fully grasped. Viewed as a mounting burden by the municipality, and currently disposed of by dumping in landfills or by burning in rural areas, organic waste should be viewed as a nutrient resource of the city. The composting of such material provides a valuable soil amendment for increasing the organic matter and fertility of soil, while it may also become water-conserving mulch for vegetable plants. This not only offers tremendous opportunity for the success of urban agriculture in the city, but provides for the inclusion of those vacant land parcels which have compacted earth and/or minimal fertility. Bohn & Viljoen (2005:262) describe the outcome: 'Sight and sounds within the city will change. Composting will reduce the number of refuse trucks

and improved biodiversity will reintroduce the dawn chorus of the sound of birds and insects.'

The sketch below demonstrates how the current situation of the typical city, the 'Consumer City,' may establish a mutual relationship with its counterpart: the 'Producer City.' Seeing potential in the city's waste (such as unutilized space, discarded stormwater, domestic goods and organic waste) allows for this to occur, providing for productive growth, and ultimately giving environmental, economic and nourishing benefits back to the city.

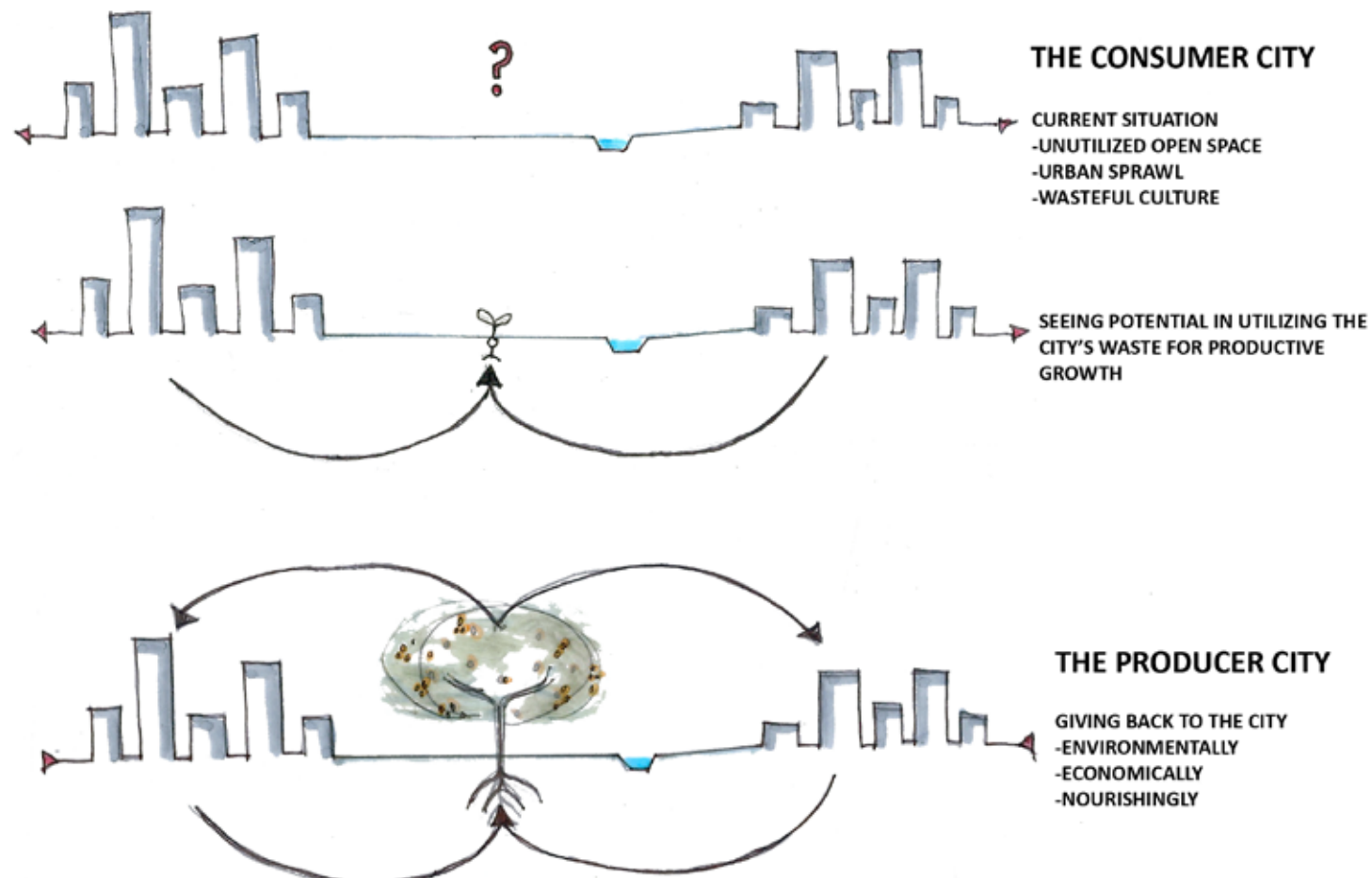


Illustration 22: Diagrammatic representation indicating the future city as both the producer and consumer of resources (Author, 2012)

**CHAPTER 2: THEORY**

**Introducing an Allotment Culture**

In encouraging the move towards a more sustainable, food-secure, producer-consumer city, the notion of allotment gardens may be encouraged. Allotments are small parcels of land rented for nominal sums and used to grow fruits and vegetables for personal consumption. They have developed from being a significant cultural heritage into an increasingly complex and dynamic part of contemporary life (Crouch, 2003:1). According to Crouch and Ward (1988), allotments were providing fifty percent of Britain’s fruit and vegetable requirements during the economic depression of the 1930s and the Second World War. During this ‘Victory Garden Campaign,’ allotments were seen as a way of averting both the hunger crisis and potential social unrest by mitigating some of the worst consequences of unemployment (Acton, 2011).

Recently, however, resurgence in the interest and demand of allotment gardens has been led by concerns over methods of food production, health and nutritional issues, and a desire not to lose any more urban green spaces to further development (Acton, 2011). In working towards these goals, allotments have, in developed countries such as Britain, Canada and Switzerland, become trendy. In 2010, the national waiting list in Britain had reached 95,000, an increase of 17,000 from 2009 (Campbell & Campbell, 2010).

The allotment movement has therefore, through history, successfully provided citizens with a means to survive economic hardships and, more recently, environmental and health concerns. With the rise of the urban population and the resultant global food crises, allotment gardening has become all the more relevant. South Africa, however, still needs to catch on to the movement and the valuable benefits it can offer. Despite a few grassroots-run community gardening campaigns (such as *Afristar*, *The Siyakhana Initiative*, and *Abalimi Bezekhaya*), there is still a huge need for food security initiatives in the country.

Crouch & Wiltshire (2005:130) ask, what then are the legitimate roles for designers from beyond the plot-holding community? At a higher scale, the designer as urban planner can help integrate allotments in creative ways into the urban scene to achieve valuable synergistic effects. Learning from the experience of good community architecture, landscape architects and architects are enabled to translate ideas using their own expert knowledge of efficiency of space use, tolerance, and the potential of particular materials. There are possibilities for integrating allotments with other related open space and built uses, such as recreational space, play areas for children while the parents cultivate their crops, the design of demonstration areas, nurseries, and market areas where excess produce can be sold. Allotment facilities may be shared by gathering spaces associated with benches and the beautification of public art, as opportunities for social intimacy within the allotment and across its boundaries are reinforced.



Illustration 23: Typical allotment gardens in Munich, Germany (From: <http://jingalex.wordpress.com/2007/10/04/kleingartensparte-allotments-gardens>)



Illustration 24: In Europe, allotment gardens become popular after WWII. This was known as the Victory Garden Campaign. (From: [http://en.wikipedia.org/wiki/Victory\\_garden](http://en.wikipedia.org/wiki/Victory_garden))

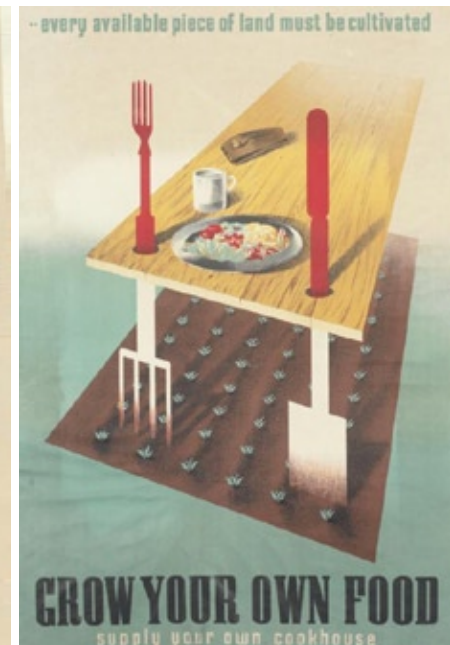


Illustration 25: The Victory Garden Campaign during WWII provided during times of economic hardship (From: <http://www.iwm.org.uk/history/rationing-in-the-second-world-war>)

Images depicting how the landscape architect may integrate allotment space with educational and artistic means



Illustration 26: An image depicting how community gardens hold the potential for educating children about the natural processes which sustain life (From: [www.openideo.com](http://www.openideo.com))



Illustration 27: A sensory garden at the Kirstenbosch Botanical Gardens, Cape Town encourages visitors to taste and smell the leaves of indigenous herbs (Author, 2011)



Illustration 28: Community gardens as an opportunity for displaying sculpture: 'Working,' by artist Andrew Woodard at Chouteau Garden, Chicago



Illustration 29: Community gardens as an opportunity for displaying local artworks, at Denver Urban Gardens, Washington (From: <http://www.bucknerfineart.blogspot.com/>)



Illustration 30: Gathering/resting space in Karl Linn community garden, decorated by local mosaic, San Francisco. This indicates the social and artistic potential of food gardens (Thompson, 2000:56)

These ideas are further elaborated in 'Part 4: Building Social Capital.'

Access of allotment plots within open public space is a significant issue worth resolving through design. Crouch & Wiltshire (2005:130) suggest protecting crops and property from misadventure through the implementation of softened but appropriate security: 'the thorn behind the lowered wire.' Additionally, incorporating the allotment patchwork with that of a multifunctional landscape in its recreational and pedestrian means invites multiple visitors throughout the different times of the day to the public open space, facilitating passive surveillance. A further initiative for security has been explored in *Chapter 5: 'Precedent Studies,'* where landscape architect Tarna Klitzner has proposed successful double volume community centres with a caretaker's lodging on the second story.

It is argued that some details of the design should be left open as opportunities for people to express their creativity and to create a sense of ownership among the community (Crouch & Wiltshire, 2005:131). The designer should thus facilitate yet not define the specific outcome of the allotments themselves. It is believed that landscape architecture, therefore, adds value in realizing the potential of the tradition of allotment gardens. Using allotments as a component of the multifunctional landscape also prevents the exclusion of those not involved with the gardens, and the threat to the plot from alternative green space uses. The landscape architect adds the dynamic of spatial structure and organisation to the allotment plot, acting as a mediator to these processes. Sense of ownership is thus promoted through this flexible framework. Summarised by Dewar & Uytendboogaardt (1995:45-46), one should essentially design the preconditions for complexity to occur. A sequence of formal space-making actions gives image to the site and direction to private actions which push out from this framework.

### Re-connecting with Nature

Urban agriculture enhances one's senses of the cycles of nature and seasonality, as expressed by the patterns of changing crop types in the landscape and their ever changing appearance from sowing to harvest, by the exposure of the earth when it is laid fallow, and by associated smells, sounds and views. According to Bohn and Viljoen (2005:246), urban agriculture intensifies the connection occupants have with the living environment.

This brings in the educational component of nurturing the environment and growing one's own food as the benefits therein are made tangible. There is a need for educating urban childrens and adults alike in where our food comes from. Appropriate training facilities and demonstration areas are thus immensely important in enabling this process as the correct and ecologically acceptable methods of cultivation and irrigation are effectively passed on. With the help of Non-Governmental Organizations such as the

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Afristar Foundation or the Siyakhana Initiative, skills transfer as well as funding may be made possible.

### Promoting Permaculture

A way in which urban agriculture can be linked to ecological processes is through the notion of permaculture. Envisaged in the 1970s by Australian ecologist Bill Mollison, the name itself derives from the idea of permanent agriculture. Permaculture uses principles of design found in natural systems to create abundant, self-regulating and sustainable systems that nourish and replenish nature while providing for human needs (Afristar Foundation, 2012). Permaculture principles are hence the result of observation of natural systems.

The 'edible ecosystem' or forest garden may be demonstrated through a productive guild (as demonstrated in *illustration 31*), consisting typically of a canopy of fruit and nut trees, a lower layer of dwarf fruit trees, a shrub layer of soft fruit, a herbaceous layer of perennial herbs, a rhizosphere of root vegetables at ground level, groundcovers such as strawberries and finally a vertical layer of climbers such as vines or beans.

According to Dunn (2010:47), a multifunctional landscape includes its capacity to reduce urban air pollution and improve air quality. Thus, providing for more trees in the city will offset urban heat island effects, filter airborne pollutants by up-taking carbon, while expanding wildlife habitat. From an urban agricultural perspective, this could include providing for orchards and arboretums where applicable in the city. Furthermore, combining urban forestry with urban agriculture technologies produces the conception of agroforestry, a sector of permaculture which is an integrated approach of using the interactive benefits from combining trees and shrubs with crops and/or livestock where applicable (DWAFF, 2010). This creates a more diverse, profitable, healthy and sustainable land use system. The resultant 'food forest' is ecologically beneficial in that it restores soil fertility through nitrogen-fixing species (such as *Dichrostachys cinerea*), and reduces runoff. The intercropping also reduces the need for pesticides, while it is said that yield increases are typically 2-3 times that of conventional practices (DWAFF, 2010).

One may observe, therefore, that the integrated approaches of permaculture and agroforestry are capable of yielding a large and diverse amount of food from a small area. These techniques are thus highly applicable for use in urban agriculture and confined allotment gardens in the city. Furthermore, these teachings include the recycling of nutrients through organic composting, as well as rainwater harvesting (both elaborated above). This ties in with the notion of Green Infrastructure.

Permaculture is an inexpensive, environmentally-efficient method of cultivation. It is

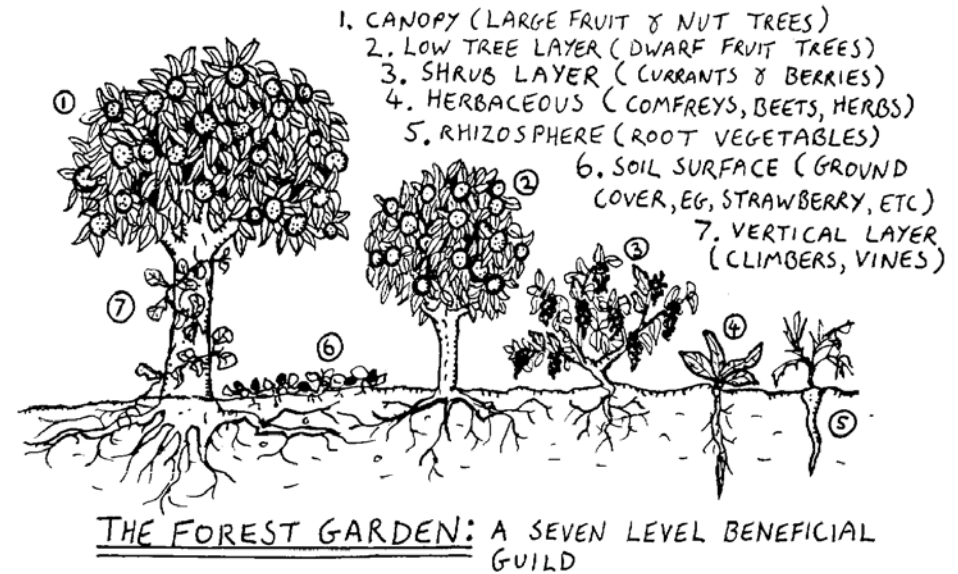


Illustration 31: Permaculture guilds of the 'forest garden' (From: <http://www.permablogger.net/permaculture-guilds/>) (Thompson, 1998:56)



Illustration 32: The natural, 'untamed' quality of a food forest at County Cork Community Gardens, Ireland (From: [http://blog.travelpod.com/travel-blog-entries/danielandeleen/6/1224578640/tpod.html#\\_](http://blog.travelpod.com/travel-blog-entries/danielandeleen/6/1224578640/tpod.html#_))

A possibility of returning some ecology to the Spruit may lie in the creation of a small furrow with a rough surface (ie. cobble stones) in the centre of the canal to guide water during low flow conditions. This will not only provide aesthetic value, but will also provide an ecological habitat for micro aquatic fauna and flora. Oxygen levels will be raised which is contributive to aerobic organisms (ARUDF, 1999:97).



Illustration 33: Cobble furrow constructed in the centre of the canal to guide water during low flow conditions (ARUDF, 1999:97).

Channel linings using Reno mattresses, longitudinal baskets of caged rubble and stones laid upon a geotextile. This allows for the natural integration process, due to the interaction with the water table, allowing for the growth of vegetation as soil and water are able to fill the voids between the stone (Maccaferri Gabions, 2001:3).



Illustration 34: Reno Mattress intervention (Maccaferri Gabions, 2001:3)

Channel reinforcement through the use of stacked gabions, caged baskets filled with stones and rubble, laid on a suitable geotextile. Like the reno mattress structure, this allows for the natural integration process, due to the interaction with the water table, allowing for the growth of vegetation (Maccaferri Gabions, 2001:3).



Illustration 35: Stacked gabion intervention (Maccaferri Gabions, 2001:3)



Illustration 36: The canalized Walker Spruit shows no sign of ecology (Author, April 2012)



Illustration 37: Latium gabion structures retaining the Farta Creek, Italy. A sense of ecology has been restored to this stream through the bio-engineering intervention (Maccaferri Gabions, 2001:14)

hence suitable for implementation by the urban poor. Artificial fertilizers are avoided through the nitrogen fixing of leguminous plants (ie. beans, alfalfa) and organic composting to recycle nutrients. Furthermore, pesticides are omitted as pests are deterred through less vulnerable polycultural planting, crop rotation and the encouragement of predators (ie. chickens) to frequent the ecosystem. It may be added that produce grown without pesticides and fertilisers and in an organic regime are higher in nutritional value than those grown conventionally, due largely to the health of the soil (Sheriff, 2005:227).

In closing with the context of urban agriculture, permaculture possesses the potential to enable the city to re-establish constructive links with the land and the natural processes that are tied to the food that is consumed. However, allotment holders would need to be trained and educated through the likes of a designated model garden and demonstration area in order to facilitate the passing on of this valuable skill.

### Towards an Urban Ecology

*'Urban landscapes possess the capacity to function as important ecological vessels and pathways' (Corner, 2006:23).*

Trancik (1986:230) states that as urban designers (and landscape architects), we should work as surgeons or auto mechanics and repair the diverse broken parts of the city rather than trying to manufacture a completely new, self-sufficient, conflict-free urban machine. Inviting ecology therefore gives significance to open urban space.

The proposed focus area is dissected by the channelized Walker Spruit. The concrete channel has converted a once natural asset into a mere stormwater channel, considered as an eyesore in the area (see Chapter 4: 'Site Analysis'). What is more, all signs of riverine ecology have been diminished. The base flow of the spruit has also increased as a result of this old fashioned engineering intervention. This is an example of how the city has taken a natural asset for granted. Following the environmental component of Green Infrastructure, it is of duty to intervene and improve the natural ecosystem of the river where possible.

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Illustrations 34-36 demonstrate how one may go about intervening. Innovative bio-engineering techniques are effective as existing on site rubble, and even recycled pieces of the concrete channel may be used to fill the reno-mattress and gabion structures. This contributes towards the notion of using waste as a resource, while untrained members of the community would be able to contribute towards the meaningful intervention of restoring and beautifying a natural asset of the city.

### Conclusion 2:

A multi-functional landscape provides numerous and interrelated benefits. It exploits the wasted resources of the city and puts them to use, making urban agriculture all the more feasible, whilst a sense of ecology is returned to the city. The land is hence elevated as an ecological, productive economic resource that promotes food security. As the natural processes of the land are re-established, though notions such as storm-water harvesting, tree canopy cover, permaculture teachings, and de-canalization, the opportunity of the education of this process is promoted through skills transfer. Related facilities (demonstration areas, nurseries, market areas), elements of recreation (gathering space, play areas, public artworks, allotment gardens) and connecting paths (pedestrian and cycling movement) add spatial structure and organization to this landscape. A new, vernacular aesthetic which looks towards the future is thus delivered.



Illustration 38: The 'Red Ribbon' boardwalk by landscape architect Kongjian Yu stitches together the diverse landscape of Tanghe River Park, Qinhuangdao City, China (From: <http://www.turenscape.com>)

## PART 4: BUILDING SOCIAL CAPITAL

*'What makes mass society so difficult to bear is not the number of people involved, or at least not primarily, but the fact that the world between them has lost its power to gather them together, to relate and to separate them.'* (Arendt: 1998:50).

Enabling people to build communities, to commit themselves to one another, and to knit together the social fabric brings about a sense of belonging whilst social networks are built. This is what the sociological term 'social capital' implies. It constitutes the 'glue' that holds communities together and refers to the foundations and connections that shape the quality and quantity of a society's social relations. Social capital is hence the idea that social relations have productive benefits. Dekker and Uslaner (2001) describe social capital as the value of social networks, bonding people and the bridging between diverse people with mutual benefit. Through interchange, cooperation, pro-activity and leadership, a strong sense of community may result from interaction and participation. Social capital thus allows citizens to resolve collective problems more easily, while teamwork is strengthened to gain shared and sometimes even economic results.

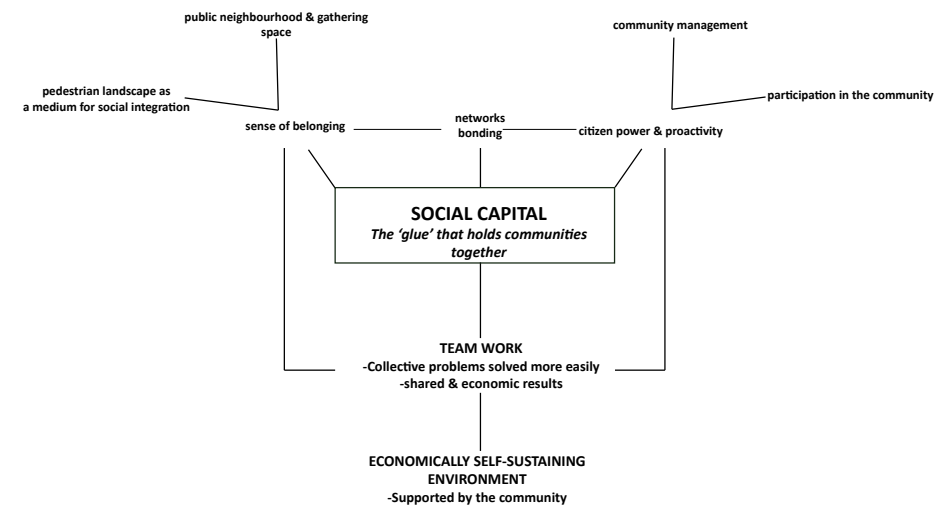


Illustration 39: Diagram indicating how social capital may be built in a community for an economically and self-sustaining environment (Author, 2012).



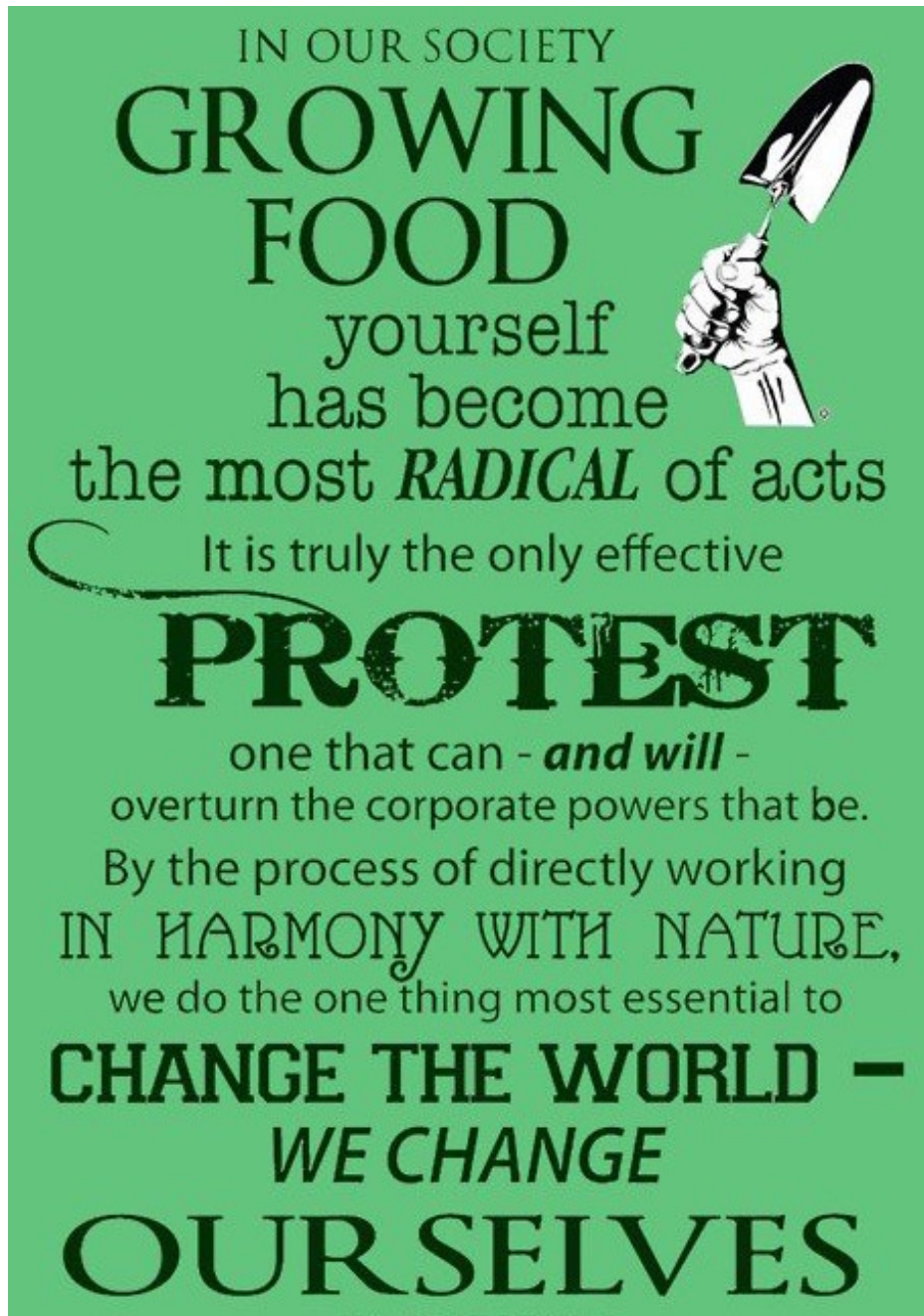


Illustration 40: Productive community anarchy, a quote by Jules Dervaes, an urban farmer (From: <http://ecodeaf.blogspot.com/>)

The suburb of Clydesdale adjacent to the focus area already has an established sense of community, their social capital attributing to the many threats of development the community has fought against successfully through history (see Chapter 3: 'Context'). Furthermore, south of the focus area, the high density region of Sunnyside East has only recently established community ties. In an effort to facilitate the social capital of Sunnyside East, whilst building on the potential Clydesdale has revealed, it is believed that the concepts of community management and open space planning could activate and, in the case of Clydesdale, strengthen the social capital of these respective communities.

### Community Management

It is proclaimed by Hough (1984:243) that the social relevance of parks and open spaces is directly connected to the level of public involvement. Furthermore, the community management of open space re-establishes neighbourhood cohesion and determination through participation and involvement.

Kaplan (cited in Hamdi, 2004:xvi), states that development is that stage you reach when you are secure enough in yourself, individually or collectively, to become interdependent; when 'I' can emerge as 'we', and also when 'we' is inclusive of 'them.' It is thus the community-based initiatives and their collective actions which become a natural part of the effort of social reconstruction and an effective way of managing cities. For example, community gardening has been found to enhance community interaction, reduce vandalism, improve food security and improve the physical characteristics of low-income surroundings. This intervention has power because it releases social energy and creates the desire to serve the community whilst establishing a sense of ownership. Design is thus made sustainable through community pride. A successful example of this community initiation is the urban homesteading movement, brought about by urban farmer Jules Dervae in California. The urban homestead is a model household that produces a significant part of the food, including produce and livestock, consumed by its residents. This is typically associated with residents' desire to live in a more environmentally conscious manner (Allen, 2009).

Hough (1984:243) declares that the urban park of the future will be seen, therefore, less and less as a free good, provided by the public authority, and more and more as an economically self-sustaining environment supported by community action and participation. This is its guarantee for diversity and future relevance.

### Strengthening Community Bonds

Talen (1999:1367) declares that sense of community can be promoted by increasing

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resident interaction. Through the provision of public space, venues for chance encounters may take place, serving to strengthen community bonds. What's more, public and neighbourhood gathering spaces in the form of parks and civic centres serve as symbols of civic pride and sense of place which promote the notion of community.

In addition, the mixed land uses of multifunctional landscapes have social benefits. When place of residence is juxtaposed with places to work, shop or recreate, social integration of different incomes, races or ages is encouraged since people will tend to walk more and drive less. With this kind of social integration, the bonds of authentic community are formed (Audirac and Shermyn, 1994:163). Achimore (1993:34) adds that the mixture of residential and commercial land uses creates a multipurpose space in which lingering is encouraged, creating a setting for repetitive chance encounters which, in turn, builds and strengthens community bonds.

The concept of allotment gardens also provides for the strengthening of community bonds. Talen (1999:1366) demonstrates that a sense of community has been linked to social control of the neighbourhood and to public ownership of neighbourhood facilities. Food growing projects can act as a focus for the community to come together, generate a sense of 'can-do,' and also help create a sense of local distinctiveness, a sense that each particular place, however ordinary, is unique and has value (Garnett, 1996). The lesson of the allotment landscape is that spaces can be enlivened through human activity; their use can engender feelings of ownership through investments of time and energy, as well as commitment (Crouch & Wiltshire, 2005:128).

It may be deduced, therefore, that physical design need not create sense of community, but rather, it can increase its probability (Talen, 1999:1374). In summary, interaction of community members may be enhanced by providing more venues for social interaction and gathering. These areas need to be positive and well-defined in order to foster a community spirit. Furthermore, community facilities are important place-making elements, while it is these places that impact the lives of many and from which many escape from the poverty of their individual circumstances (Dewar & Uytenboogaardt, 1995:48).

In short, open space planning should be concerned with community building. An investment in the place, in its social and physical setting, is thus an essential element that makes the neighbourhood



Illustration 41: Architects facilitating design decisions for the community (Author, Mamelodi, 2011)



Illustration 42: Key West community Garden, Florida, holds monthly community lunches as a social exchange event (From: www.keysglee.com)



Illustration 43: Moretele Park provides multiple spaces for social gathering, braai facilities among them are very popular for the surrounding community (Young, 2009)



Illustration 44: Mosaic art by the community at Moretele Park, showing how the community was actively involved in the beautification of their district. Soweto (Young, 2009)

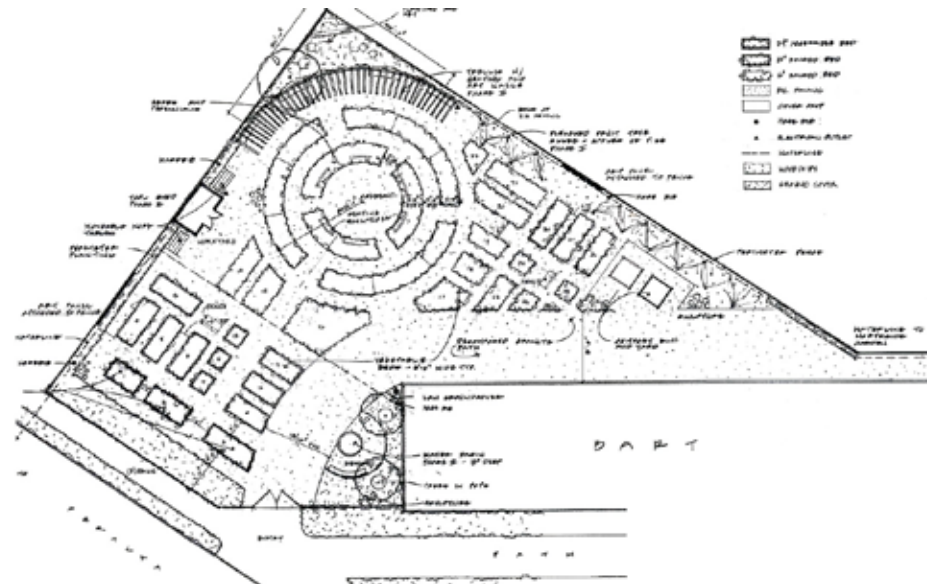


Illustration 45: Karl Linn Community Garden, San Francisco. Note the circular commons as a central gathering place (Thompson, 2000:57)



Illustration 46: Vine pergola-shaded gathering space, demonstrating how productive space can simultaneously become social space. Vergelegen Wine Estate, Cape Town (Author, 2009)

Images depicting how the landscape architect may facilitate in the strengthening of community bonds



Illustration 47: Providing place for self-expression in public mosaic art at Moretele Park, Soweto (Young, 2009)



Illustration 48: The Karl Linn garden in San Francisco hosts a variety of community events, including tai chi classes (Thompson, 2000:59)



Illustration 49: Horizontal, vertical and espaliered vegetation frame kick-outs and playing fields for the community (Viljoen, 2005:292)

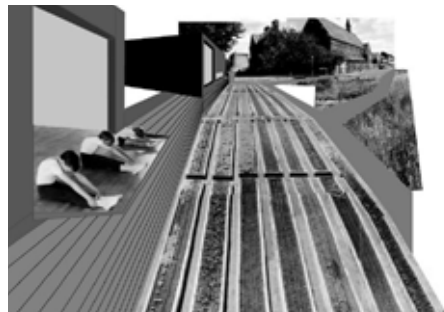


Illustration 50: Community gardens may act as a contemplative setting for the community seeking refuge from the bustle of the city (Bohn & Viljoen, 2005:252)

### Conclusion 3:

Providing places of gathering and recreation stimulate neighbourhood interaction. Allotment and community gardening encourage the involvement of collective individuals, whilst generating a sense of ownership. These mixed land uses of the multifunctional landscape create a setting for repetitive chance encounters which builds and strengthens community bonds. These bonds ensure the relevance and utilization of the space, necessary for its upkeep into the future. Through community management, pressures on the authorities may be decreased whilst pride of ownership and a sense of belonging may be established. This paves the way forward for establishing social capital and its self-sustaining benefits within a given community.

### OVERALL CONCLUSION: A PERSONAL DESIGN MANIFESTO:

In the wake of the environmental crisis and overpopulation, lost and unutilized space permeates sprawling cities and offers vast potential for urban renewal. In realizing the importance of landscape over built form, the theory of Green Infrastructure has thus become essential to thwart the impact of rapid urban growth in much of the world, offering a promising new direction for shrinking cities. Landscape is thus the infrastructure of the future, while 'more than ever we need spaces for discovery, repose, and privacy in our increasingly bewildering, spiritually impoverished, overstuffed, and under-maintained garden Earth' (Peter Walker, as cited in Wilson, 2002:75).

As the era of mere beautification and monument-building is coming to a close, and in finally realizing the wasteful society in which we live, urban agriculture is the way forward, especially in developing countries like South Africa. Continuous Productive Urban Landscapes (CPULs) highlight the productive potential the connected landscape holds in terms of food security. Through the multi-functional capacity of this land use; economical, productive, nutritional, social and recreational measures are reached. What's more, the city's wastes may be exploited as resources that promote the feasibility of urban agriculture. Providing opportunities for community collaboration through interventions such as allotment gardening schemes and gathering space assists in initiating social capital which leads to a holistic and self-sustaining system.

The resultant outcome will consist of a series of connected reclaimed land, converted to relevant, useful open space which cultivates not only nutritious food and an urban ecology, but also meaningful relationships and hence the social capital between the diverse citizens of our country.

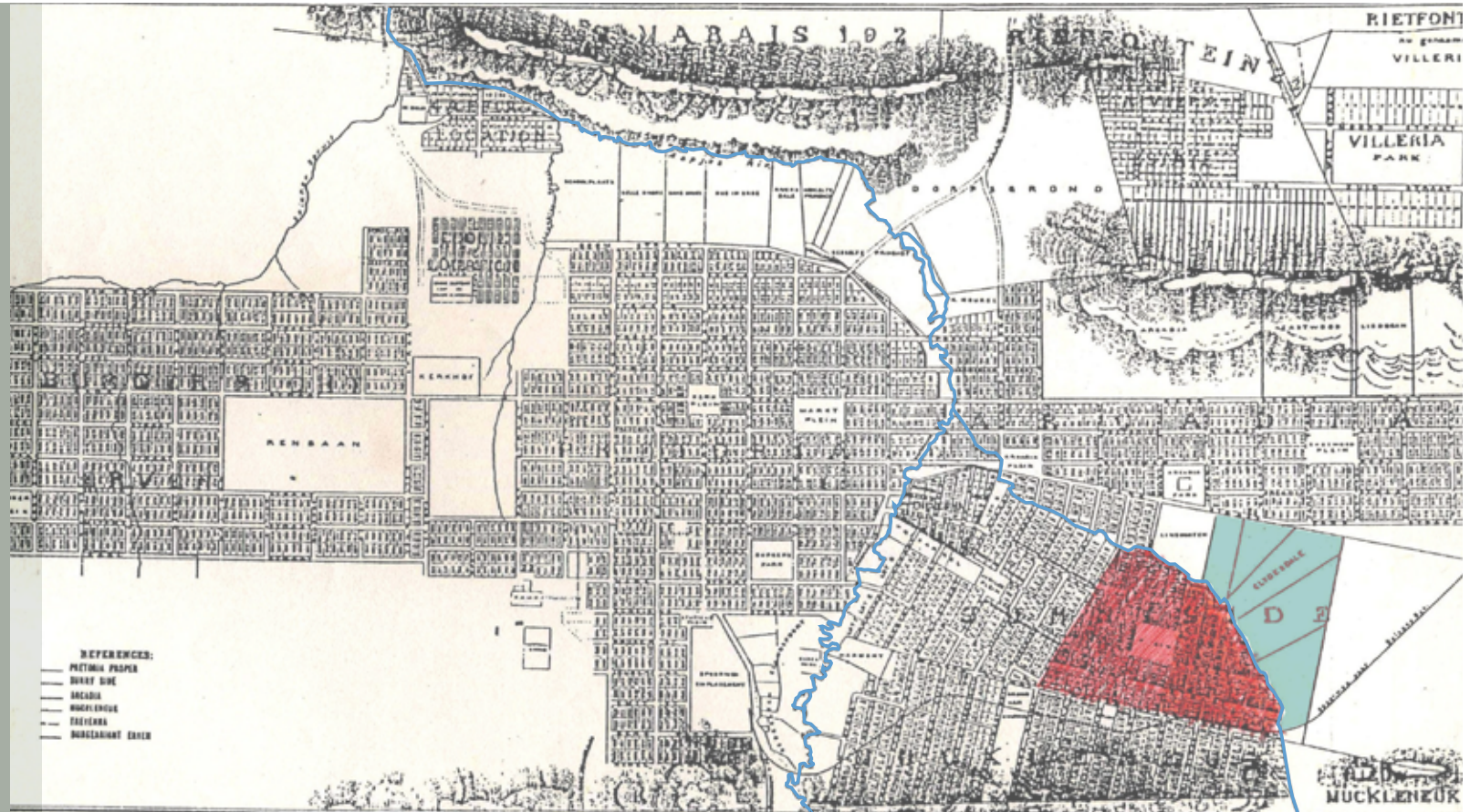
## **SYNTHESIS OF INVESTIGATION:**

The main design objectives derived from this theoretical chapter are summarised as follows:

- 1. A pedestrian and cycling network should be used to stitch the landscape network together**
- 2. The sustenance of urban farming should be provided by the harvesting of stormwater**
- 3. Provisions are needed for the composting of organic waste near spaces allocated for urban farming**
- 4. Allotment gardens should be integrated with other open space and built uses, such as: recreational space, play areas for children, demonstration areas, nurseries/seed banks, market areas, gathering space, public art, etc.**
- 5. Opportunities for watching and learning from the gardens should be provided as an educational element in the design**
- 6. Allotments must be managed by a caretaker and secured with unobstructive fencing**
- 7. The communities of Clydesdale and Sunnyside East must be united and involved in the design process**
- 8. Public and neighbourhood gathering and lingering spaces need to be provided as place-making elements**

*Landscape means an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors*

*(Council of Europe, 2000).*



1890

PLAN OF PRETORIA SUBURBS AND SURROUNDING GROUNDS,  
REDUCED FROM ORIGINAL PLAN COMPILED IN THE  
SURVEYOR GENERAL'S OFFICE, PRETORIA, S.A.R.  
SCALE:



CONTEXT

Illustration 51: Historical 1890 plan of Pretoria, with Sunnyside shaded in red and Clydesdale in green (Andrews & Ploeger, 1989) (manipulated by Author, 2012)

## CONTEXT

### INTRODUCTION

The specific focus area chosen for the purposes of this dissertation is the ‘no-man’s-land’ open space transected by the Walker Spruit which divides two distinct suburbs (*refer to illustration 59*). The suburb of Sunnyside East towards the South is a high rise, high density residential and commercial area. This is in stark contrast to the northerly suburb of Clydesdale which is a low density, affluent residential zone with a rich historical past. This chapter will proceed to discuss the historical development, the status quo and the community of each respective suburb in order to gain contextual insight of the focus area. The Walker Spruit itself will be discussed in addition to its associated urban trail, the ‘Kerneels Young Hiking Trail.’ The location of the area of study has specifically been chosen in its context as a typical area effected by the consequences of rapid urban growth.

### SUNNYSIDE BACKGROUND

#### Historical Sunnyside

Founded in 1855, Pretoria’s valley is east-west orientated, parallel with the Magaliesberg ranges. This influenced the direction into which the town, with Church Square as centre, would develop and extend (*refer to illustrations 55 and 56*).

As the first area development to the east began in 1889, Sunnyside was established as a residential development area on a farm named Sunnyside (*refer to illustration 62*). The direction of irrigation furrows influenced the layout of the suburb as one notes how the streets run perpendicular to the Walker Spruit. It was only merged into Pretoria in 1890 after the inclusion of the suburb of Arcadia in 1889 (*refer to illustration 55*). Laid out in close approximation to the city centre by Johann F. Rissik and G.R. von Wielligh, these two suburbs were very popular, and developed accordingly. However, further expansion of the city between 1900 and 1910 was brought about by the installation of the railway line between Germiston and Pretoria. As electricity was introduced, tram tracks were established which made it possible to live further away from the city.

Since available ground had to be maximized, erven were subdivided into smaller units. According to Engelbrecht (1955), this led to a degrading of the status of Sunnyside. As the erven became cheaper, the middle class could afford to live there while the Victorian style of the older farm houses became a decorative influence bringing the suburb a unique identity.



1). 1855: The founding of Pretoria



2). The expansion of the city giving rise to the establishment of Sunnyside, Clydesdale, and Arcadia



3). -1950's: further expansion: erven subdivided for the construction of large apartment blocks.  
-1960's: road network separates Sunnyside from the inner city.



4). The current situation: New frameworks are being explored to revitalize the inner city, however, the connectivity of the suburbs possess latent potential

Illustration 52: The development of Pretoria (Group framework, 2012)

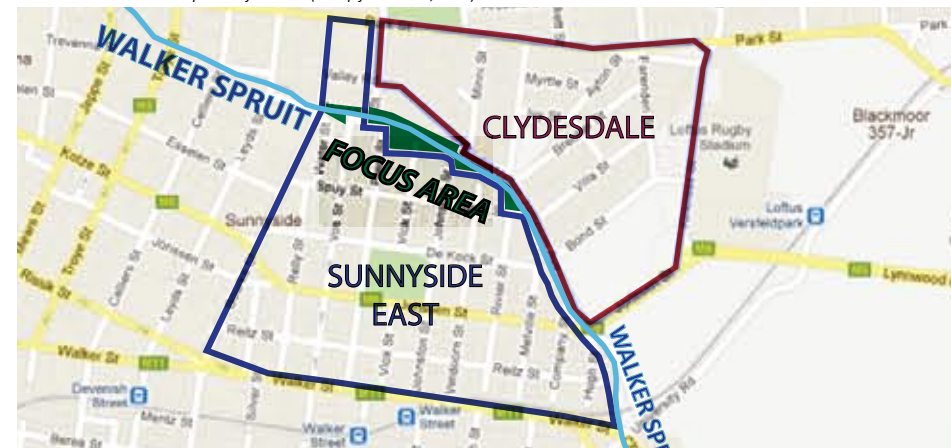


Illustration 53: Road map showing the suburb boundaries of the focus area, transected by the Walker Spruit (Author, 2012).



Illustration 54: Painting of Pretoria in 1872, seen from the Union Buildings with the focus area to the middle right, by Thomas Baines (Bolsman, 2001:20).



Illustration 55: Farms House in Pretoria, showing a water wheel and mill on the banks of the Apies River, by W.H. Throne (Bolsman, 2001:135).



Illustration 56: Sunnyside, Pretoria, 1938. A farming community (Boegman, 1994).



Illustration 57: Early Pretoria farmer (From: <http://cityfarmer.info/20011/02/>).



Illustration 58: Focus area (circled) in context today, with Sunnyside on its west and Clydesdale to its east. The CBD lies towards the far west. (Google Earth image, manipulated by author, 2012).

During the 1950's, a residential shortage occurred due to a huge population increase. This led to the rezoning of Sunnyside in order to construct high density residential blocks, totally destroying the old spirit of Sunnyside (Engelbrecht, 1955). With a rocketing population increase, a resultant housing shortage threatens the last of the small houses. What's more, the thoroughfare framework of the 1960's expanded the road network along the Apies River, resulting in Sunnyside's isolation from the inner city (as seen in illustration 56).

The suburb of Sunnyside thus serves as a prime example of an area effected by rapid urban growth. It's original identity transformed from a rural farm, to a quaint suburb. Whilst vehicular modes of transportation took preference and even decreased in size to make way for an increasing population, it evolved into the high rise, high density residential area it is today.

### Sunnyside Today

Sunnyside is classified as one of Pretoria's only high-density, high-rise residential areas. Some of the old houses still exist to the eastern side, while large five-to-seven-storey housing blocks dominate the western and southern part of the suburb (see illustration 64). From 1994, the area took an economic turn as apartheid drew to a close. This resulted in a large sum of the white population leaving the area, while almost a decade later some of the residential flats of Sunnyside are badly dilapidated. Furthermore, illegal immigrants have inhabited the city to look for employment. Illustration 65 indicates that the employment status from a census done in 2001, 6.65% of the people in the area are unemployed. Furthermore, an income category census indicated in illustration 66 proves that the bulk of the demographics of the area are of low-income status, whilst a majority earn no income at all. (Note that the 'no income' category includes minors, students and the elderly). This information verifies Sunnyside as an area that is in need of upgrading in terms of infrastructure support and job opportunities.

On the other hand, Sunnyside offers major advantages in its accessibility to town and major educational institutions within Pretoria (ie. the University of Pretoria and numerous high schools), which are all within walking distance. Sunnyside also remains popular with students because of the availability of flats and their affordability. Jacaranda trees define the streets and give the suburb identity through its easy-to-navigate grid which speaks of Pretoria's heritage.

While new frameworks have been proposed to revitalize the inner city, Sunnyside is yet to be reconnected to the CBD, finding itself in a limbo of depleted energy (refer to illustration 58). Latent potential for this lies within the open and underutilized space along the Walker Spruit. Furthermore, the idea of urban agriculture and community gardens

## CHAPTER 3: CONTEXT

within this area may reveal and pay tribute to the historical farm layer of the suburbs which have been largely forgotten. Additionally, the health of the dwellers of this high density area may be improved, while economic benefits and job opportunities will be provided as they are invited to the much-needed open space of this recovered landscape.

The Sunnyside East Residents and Ratepayers Association (SERRA) has been identified as a recently established community network in the area. The importance of including the community into the design proposal has been stated in *Chapter 2: 'Theory,'* as an initiative for building the social capital of the citizens of the area. This organisation therefore provides a meaningful opportunity for being integrated and included in the proposal process.

### The Sunnyside East Residents and Ratepayers Association (SERRA)

The Sunnyside East Residents and Ratepayers Association is a community organisation which was recently founded in 2012. Its goal is to provide a unified voice for residents and ratepayers in Sunnyside East. Their key concerns relate to general council issues, the Walker Spruit CID, and the state of the Walker Spruit itself (see *Chapter 4: 'Site Analysis'*). Relying on the commitment of its members to improve the community, it is open to all residents, business owners, and rate payers in the area between the boundaries of Walker Street, Johnson Street, and the Walker Spruit. An interview with the chairperson of the committee, Graham Dominy (7 May, 2012) revealed that recent debates have given rise to the desire for a community park along the Spruit, while proper facilities for recycling are needed. The first meeting was held at Seuns Hoër in February, 2012.

## CLYDESDALE BACKGROUND

### Historical Clydesdale

In 1891, Johan Rissik (1857-1928), surveyor general of the Republic of South Africa settled into his new home, 'Linschoten Huis' with his wife, overlooking Park Street. Later, in 1898, the original township of Clydesdale was surveyed by AH Walker who laid out 45 erven on what was originally an established on a portion of land of the Elandspoort farm known as Clydesdale (Clydesdale Village, 2011). Marking its 100 years of existence in 2004, it was proclaimed as a site of heritage significance. The suburb of Clydesdale is hence one of the oldest suburbs in Pretoria as the delicate fabric of loose-standing, single-storey residences date back more than 70 years. Clydesdale is therefore an historical area of architectural significance (Clydesdale Village, 2011). This is in stark contrast with the high density, multiple storey flats which dominate neighbouring Sunnyside today. Known as the 'Village in the City,' the Victorian architecture gives the area a distinct character. The suburb is associated with numerous institutions; the Pretoria High School for Girls, the University of Pretoria, Pretoria Boys High School, Meisies Hoër, Seuns Hoër and the Pretoria Technical High School. It is about 500 metres east from the

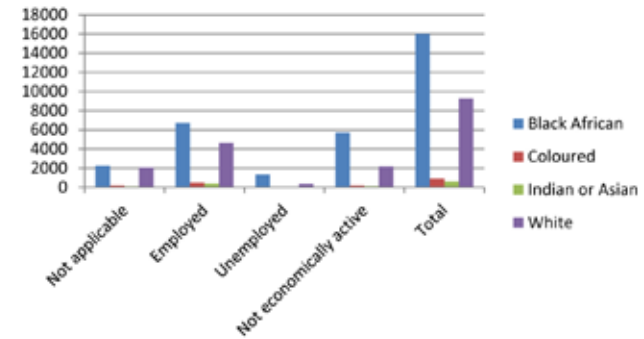


Illustration 59: Population Group by Employment Status for Person Weighted, Sunnyside. This proves that a majority of the population of the suburb do not earn an income (Census 2001, Stats SA)

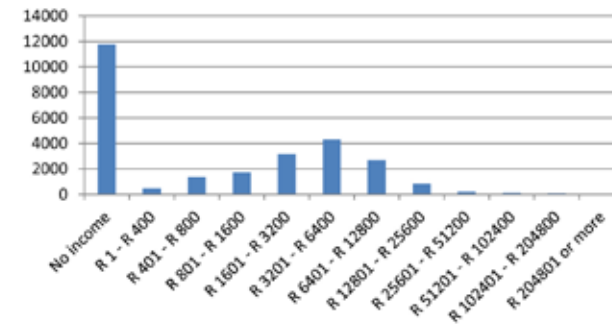


Illustration 60: Income Category for Person Weighted, Sunnyside, indicating that a majority of the population are of low-income status (Census 2001, Stats SA)



Illustration 61: Typical High rise flats of Sunnyside East (Author, April 2012).



Pretoria landmark of the Loftus Versfeld Sports Stadium.

### The Clydesdale Village Association (CVA)

Since 1967, Clydesdale has succeeded in surviving numerous radical spatial transformations of the urban fabric of Pretoria, mainly due to community opposition. Clydesdale thus has a strong and established sense of community. In 1989, the Simon van der Stel Foundation (now Tshwane Building Heritage Association) arranged a meeting at the University of Pretoria to inform the Clydesdale residents of their rights in view of the various threats aimed at the suburb (Clydesdale Village, 2011). As a result, an enthusiastic group of residents formed the 'Clydesdale Conservation Committee,' which later became the Clydesdale Village Association (CVA). The achievements of the committee are as follows:

- 1989 : The rejection of the proposed freeway system through Clydesdale (of the proposed 1967 Road Transport System for Pretoria)
- 1989 year-end: A neighbourhood description prepared by architects of the Clydesdale Village Association was distributed to City Councilors
- In 1990, the Clydesdale Village Association drew up a constitution. The committee, together with those of Hatfield and Arcadia, opposed the re-zoning of the area adjacent to Loftus Versfeld Stadium for the erection of a hotel.
- 1999: The CVA, in alliance with surrounding schools, Pretoria East NG Kerk and other affected parties in the area, opposed the proposed large-scale development of Loftus Park (comprising offices, businesses, a hotel, 4000-bay parking area, sports club, clinic and residential units). The idea of having Clydesdale preserved in the context of a security and heritage village was suggested as an alternative.
- 2002: A coalition of the CVA, Pretoria High School for Girls, Cornerstone Assembly and Pretoria Technical High School successfully opposed the proposed alignment of the Gautrain along Park Street.
- 18 June 2004: A delegation from Gauteng Provincial Heritage Resources Authority visited Clydesdale and declared that under the new Heritage legislation, the suburb merited proclamation as a site of Heritage significance.

### Clydesdale Today

Clydesdale has thus survived numerous threats through its resilient community partnership. The historical character of the area has thus been successfully retained. The adjacent sketches by resident Professor 'Ora Joubert show how the historical architecture gives Clydesdale its unique character and sense of place. An interview with the Clydesdale Village Association chairperson, Audrey Williams (4 May, 2012) revealed that the community meets once a month at a private residence in order to discuss legal and domestic issues that deal with the council. Additionally, community braai's are held intermittently at Myrtle Park in order to strengthen the neighbourhood spirit. What's more, the Clydesdale Resident's Association has their own website ([www.clydesdalevillage.co.za](http://www.clydesdalevillage.co.za)), as well as a yearly newsletter magazine, 'The Clydesdale Chronicle.'

### The Walker Spruit and the Kerneels Young Hiking Trail:

The Walker Spruit, a tributary of the Apies River, runs from the Waterkloof koppies through the Eastern suburbs of Pretoria (Joubert, 2009). The Kerneels Young Hiking Trail is a an urban trail, named after a former Mayor of Pretoria (interviews: Dominy, 2012 & Mostert, 2012), running alongside the Walker Spruit. The trail starts in the suburb of Brooklyn, directly opposite Brooklyn Mall shopping centre, where the Walker Spruit originates as it transects various landmarks of Pretoria, such as the Austin Roberts Bird Sanctuary, Nieuw Muckleneuk Trim Park, and Magnolia Dell Public Park. It terminates near the city centre, opposite the Caledonian Sports Grounds, before the Spruit's confluence with the Apies River. Originally intended as a pleasant walk through the city, this pedestrian pathway has been neglected (see chapter 4: 'Site Analysis') and miskept. As the Walker Spruit became channelised north of the railway in Jorissen Street in the 1920's (interview: Williams, 2012) the aesthetics of the



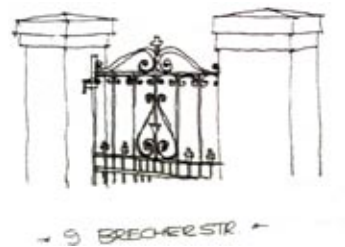
SKAKELHUISE - BRECHERSTRAAT.



TERENDE BOUWSTYL - WINNESTRAAT.



ZONBAARSTE SKEETSTEE EN SUKKELO GRENSVURE - 18 BRECHERSTR.



9 BRECHERSTR.

Illustration 62: Sketches of the typical historical residences of Clydesdale, still existing today (Joubert, 1989)

**CHAPTER 3: CONTEXT**

surrounding open space degraded. As a result, most buildings turn their back on the Spruit resulting in the isolation of the linear open space. It is because of this isolation, that people choose to move through this space rather than linger. Furthermore, the concrete channels of the Walker Spruit are collapsing at certain points, resulting in erosive damage.

The design intervention, therefore, should seek to recover the urban trail through its revampment. The lost space around the Walker Spruit needs to be reclaimed, and facilitated towards building a sense of place. The Walker Spruit itself needs ecological values returned to it as its channels are restored (see illustration 70).

Illustration 63: The Kerneels Young Hiking Trail termination in Jeppe Street, Sunnyside (Author, March, 2012)



Illustration 64: The current unkept condition of the Kerneels Young Hiking Trail and the Walker Spruit (Author, April, 2012)



Illustration 65: Route of the Kerneels Young Hiking Trail through the suburbs of Muckleneuk, Clydesdale, and Sunnyside. Some street furniture is placed intermittently along the route, starting in Magnolia Dell, through Clydesdale upwards. Lighting is poor, and there are few litter bins (Author, 2012)

## OTHER CITY OF TSHWANE METROPOLITAN MUNICIPALITY DEVELOPMENT PROPOSALS

Tshwane Municipality has realized the problems and potentials of the area and has been working on development and regeneration plans for the inner city, including Sunnyside as a focus area. The City Development Strategy, the IDP and the Metropolitan Spatial Development Framework have all identified the inner city, which together include the development goal of ‘becoming the leading international African capital city of excellence that empowers the community to prosper in a safe and healthy environment.’ It is believed that these strategies will pave the way towards the vision of becoming the ‘African Capital City of Excellence.’ The purpose of the Tshwane Inner City Development and Regeneration Strategy is to lay the foundation for the repositioning and regeneration of this area through the introduction of certain key interventions (Tshwane Inner City Development and Regeneration Strategy, 2006).

For the purposes of this dissertation, the following framework proposals will be taken into consideration. The overall framework will accordingly ‘plug in’ to what has been proposed, although this will not necessarily limit the dissertation’s conceptual means.



Illustration 66: ISDF Open Space System Masterplan (ISDF, Part 1, 1999:32)



Illustration 67: Walker Spruit Residential Park Master Plan Proposal (ISDF, Part 2, 1999:35)

## Walker Spruit Residential Park Open Space System Master Plan Proposal of the Pretoria Inner City Integrated Spatial Development Framework (ISDF), 1999

The proposed Inner City Open Space Plan, or Green Plan, has been proposed as a system and hierarchy of open spaces. This Open Space System Masterplan is envisaged in *Illustration 73*. The open spaces are not isolated individual areas, but form part of a continuous system, treated as a network across the Inner City that is integrated with other land uses. Structural elements within this include activity spines or green corridors, open space linkages, accessibility and urban trails (ISDF, Part 1, 1999:30).

Within the ISDF, a Walker Spruit Residential Park has been proposed as a link between the city centre and Magnolia Dell as well as the eastern suburbs. The Walker Spruit is hence referred to as the ‘Residential Open Space Linkage.’ Additional open space has been reclaimed in order to supplement the existing open space along the Spruit. The resultant linear park includes the widening of the Kerneels Young Hiking Trail, ramps at road intersections to provide a safe pedestrian linkage, and the widening of the Spruit where possible. ‘In areas where the Spruit must stay as a canal, due to space and cost limitations, a series of automatic floodgates have been proposed (similar to the Apies River proposal) in order to raise and enlarge the water level and to reduce the impact of the concrete structures (ISDF, part 2, vol 2, 1999:35-36).

Design guidelines include that no detail planting has been proposed to reduce landscape maintenance, while large lawn areas with strategic tree planting and recreational amenities have been proposed. It is suggested that ablution facilities are provided for and protected against vagrants. The recreational facilities suggested include play parks, kick-abouts, picnic facilities, story and discovery gardens and seasonal gardens. Commercial facilities such as restaurants, coffee shops, tea gardens, public art exhibitions, amphitheatres and outdoor classrooms have also been suggested to support use and activity in the open space (ISDF, part 2, vol 2, 1999:36).

The above design guidelines and suggestions will be taken into due consideration in the implementation of the design for this dissertation. The recreational facilities proposed are important community amenities and will add a sense of place to the site. However, the productive, self-sustaining and economic potential of the site has not yet been real-

**CHAPTER 3: CONTEXT**

ised, which may persuade the authorities to actually implement the proposal.

**Apies River Urban Design Framework (ARUDF), Holm Jordaan Group, 1999.**

This extensive framework has been summarised into main points which relate to the scheme of this dissertation:

- The aim of this Urban Design Framework is to provide solutions for the physical upgrading of the Apies River as part of an open space network and mechanisms for the effective management of development adjacent to the river (ARUDF, 1999:5).
- It is stated that the river should be an integrated open space system, building on existing and potential ecological and cultural opportunities (ARUDF, 1999:37).
- By exploiting the river as a multi-functional civic spine for Tshwane, an integrated system of ecological and cultural opportunities which interact meaningfully with its environment will be generated.
- A goal is to turn the river into an inspiring place for social interaction by creating tourist opportunities and pedestrian activities along it.
- The river development should fulfill the needs of the communities of the areas through which it runs (ARUDF, 1999:37).
- Maintenance and management should be done in partnership with all the communities (ARUDF, 1999:37).
- Business opportunities should be created (ARUDF, 1999:37).
- This framework aims to strengthen the interaction between the river and its surrounding environment by creating an appropriate interface between adjacent developments and by making it user-friendly for locals and visitors (ARUDF, 1999: 84).

**Tshwane Open Space Framework (TOSF), 2006.**

The Tshwane Open space framework provides a holistic framework to guide and direct the sustainable spatial development of the city and in a context of rapid population growth, urban sprawl, poverty and dwindling financial resources to address the integration and utilisation of Open Spaces in a sustainable way. The framework also facilitates

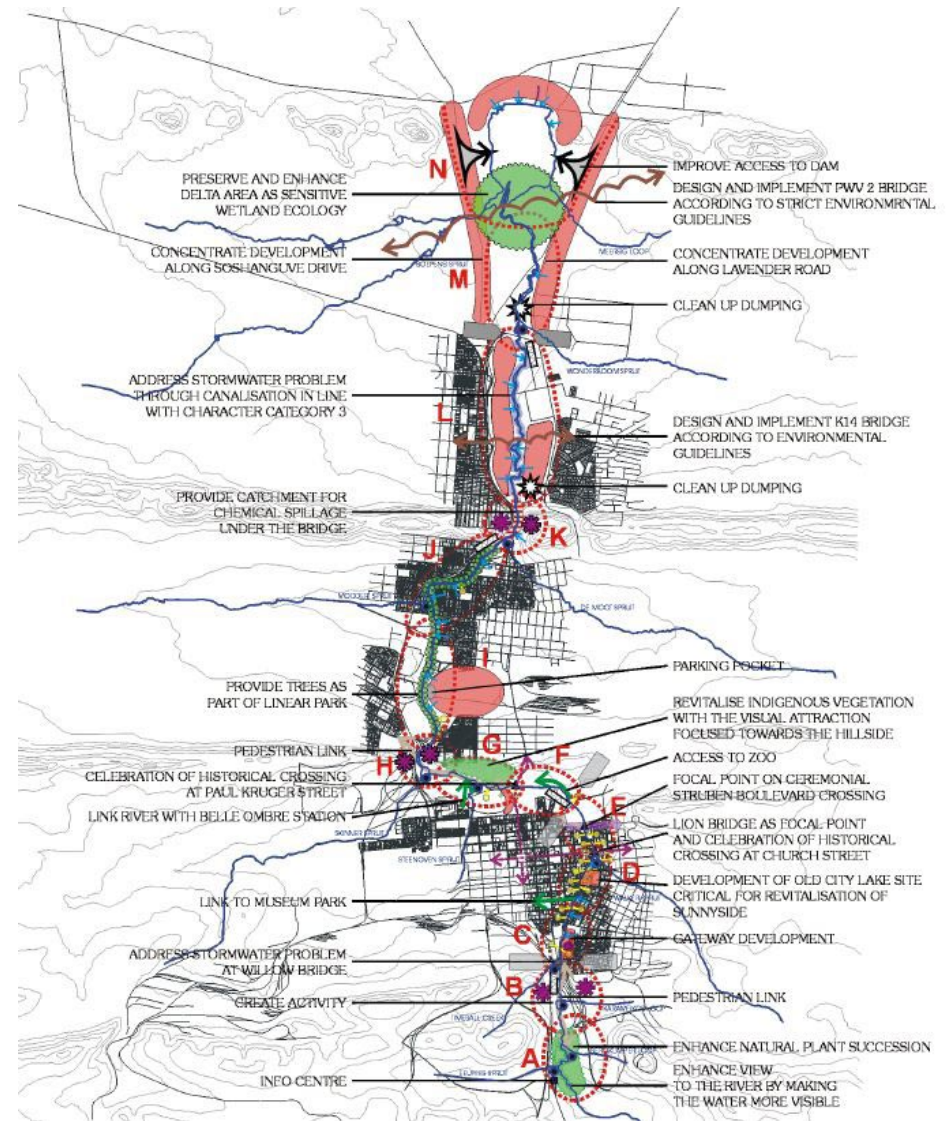


Illustration 68: Apies River Development Framework Proposal (Holm & Jordaan, 1999:39)

the effective management of the environment and maximises the potential of Open Space to benefit the city as a whole. The Open Space vision and its building blocks as qualitative guidelines are strong influencing factors of this dissertation:

The Open Space vision is stated as follows: '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 all its ecological systems.' (TSOF, 2006:30)



Illustration 69: Tshwane Open Space Framework Metropolitan Open Space Plan (TSOF, 2006:63)

The building blocks of this vision:

- **'A sustainable network:'** An open space network of interconnected open space, accommodating ecological processes, biodiversity conservation and providing appropriate economic development opportunities.
- **'Capital City:'** Emphasizing a symbol of the state and a place for people to gather. Implications include gathering spaces, event spaces, gateways, landmarks, ceremonial spaces and designing for a Sense of Place.
- **'City:'** The pressure for open space in the city is stressed, as well as the need for different types of open spaces. A choice or variety of open space that is responsive and democratic is needed. What's more, open space should be viewed as a tool in structuring and re-structuring the city.
- **'Tshwane:'** The special character of the city needs to be enhanced, responded to, and protected. This includes the unique place-making opportunities created by the confluences of nature and city, past and present.
- **'High international standard:'** Quality of life is believed to be promoted by high environmental standards, high-quality public space, low pollution levels and a commitment to biodiversity.
- **'African context:'** This means a spiritual and productive connection to nature. Implications include spatial dualism, the importance of the primeval landscape and multifunctionality.
- **'Prospering:'** Promoting a city where all inhabitants can carve out a meaningful livelihood. Implications of the TOSF include job creation opportunities and the provision of productive open space.
- **'Safe and healthy:'** Open space should take security into account, protect natural elements and ensure the continued rendering of ecological services.
- **'Integrity of the ecological services:'** The structuring of the city around natural processes and systems instead of nature being subjected to processes of urbanisation.

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**Consortium Fook Framework, by Prof. 'Ora Joubert, (former HOD Dept of Architecture, University of Pretoria) and Braam de Villiers, Earthworld Architects, 2009.**

Concerned with the underutilisation of public space and the lack of public art in Tshwane, a Walter Battiss-inspired beautification framework along the Walkers Spruit has been devised by architects 'Ora Joubert and Braam de Villiers.

Walter Whall Battiss (1906-1982), one of the city's most famous artists, was chosen by Consortium Fook as the figure to honour by installing murals (alongside the concrete channels of the Spruit), water features and free-standing sculptures of his inspiring work along this specific site. The aim of the framework is to celebrate and honour important Tshwane artists while invigorating the city. This has been inspired by the relationship between Gaudi and Barcelona, as the Spanish architect's influence attracts tourists because of his work. Furthermore, the artworks have been proposed to be done in mosaic, as it is a highly durable medium that may be executed by the unskilled.

The area for this framework was strategically selected. 'Pretoria has the distinction that it evolves around three rivers: The Apies, originating at Fountains Valley; Walker Spruit running from the Waterloof koppies through the Eastern suburbs; and Moreleta Spruit further east. Walker Spruit is arguably the most strategic as it runs through the city's major sport-cum-cultural hub with Loftus and the University of Pretoria as its nucleus. It also connects with Sunnyside, the most densely-populated area in the city and joins the Apies River in the city centre. The Walker Spruit has thus been seen as a catalyst for urban rejuvenation. Frustration at the eyesore of the Walker Spruit-Apies River Spine's



Illustration 70: Walter Battiss 'Self-Portrait', undated Watercolour (<http://www.artthrob.co.za/05nov/reviews/standardbank.html>)



Illustration 71: 'The Invention of Walking Feathers' by Walter Battiss Colour serigraph (<http://www.artaffair.co.za/main/enLarge.php?ID=3327>)



Illustration 72: 'Bushman Impressions' by Walter Battiss, Oil on Canvas (<http://www.artthrob.co.za/05nov/images/battiss07a.jpg>)



Illustration 73: 'Limpopo' by Walter Battiss, Screenprint (<http://www.graphicclub.co.za/products-page/walter-battiss/>)

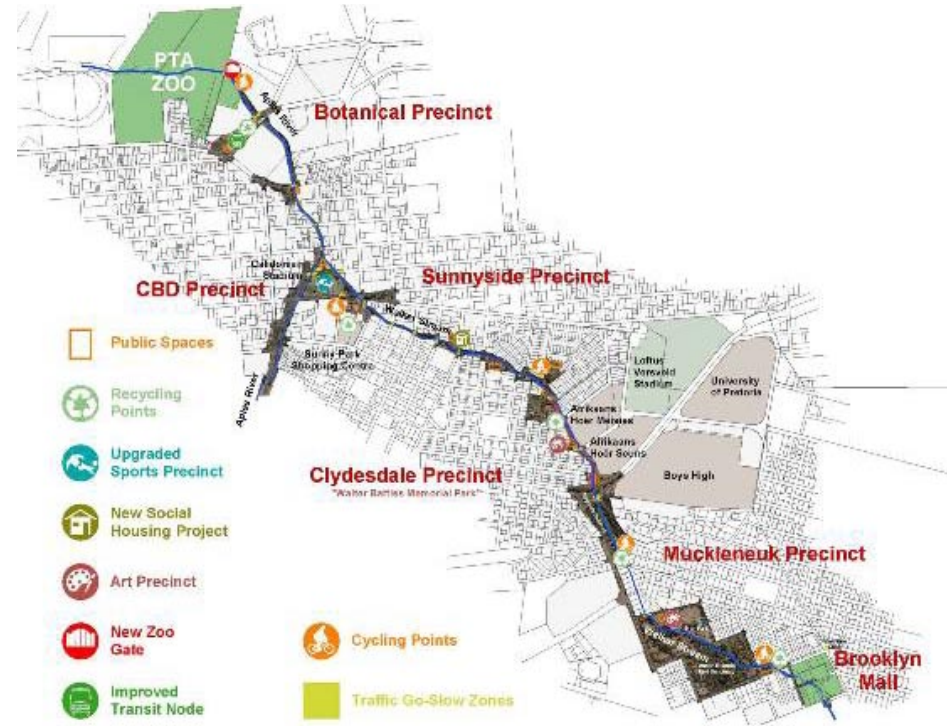


Illustration 74: Consortium Fook Master Plan Proposal (Courtesy of Joubert, 2009)

underutilisation prompted an eco-design strategy, entailing a prominent community park, combined with an eco-recycling network' (Joubert & de Villiers, 2009).

A study of the macro context indicated that the Walker Spruit and Apies River could jointly be activated to form the seminal green spine of the city. This would stretch from the Brooklyn Shopping Mall, via the Loftus area, Sunnyside and the City Centre to the Pretoria Zoo, and it could also connect to the Fountains Valley and Groenkloof Nature Reserve. An eco-transport system connecting this Walker Spruit-Apies River Spine would encourage pedestrian movement and cycling, whilst a recycling network with *en route* depots has been proposed to address social sustainability whilst mobilising community participation. This would formalise the current activities of the homeless (currently they sustain themselves by collecting refuse which is deposited at various collection points in the CBD, earning a total of R50-00 per collection).

The initial catalytic area within this framework has been identified at Clydesdale (ie. at the focus area of this dissertation), with the artist Battiss having a particular connection to the area, having taught art at the nearby Pretoria Boys High School for a number of years. This would culminate in a Walter Battiss Community Park. The second catalytic project is to establish the eco-recycling network. The project has been proposed to be initiated as a community effort, spearheaded by students from the Tshwane University of Technology and the University of Pretoria. The involvement of the children from nearby schools, as well as the public would also be encouraged, whilst the implementation will be supervised by qualified local artists. The intention is that such a park would not only enhance the area and offer inviting public space, but also add to the value of the city for visitors.



Illustration 75: Consortium Fook Proposal for a Walter Battiss Memorial Park (Courtesy of Joubert, 2009)

In the short-term, the proposed facilities in the Park would include:

- representations of Battiss' works of art – some free-standing, some participatory
- water features – mostly in the form of pavement fountains
- children's play areas with secure play equipment
- supervised and well-maintained public ablutions
- a recycling depot
- improved and attractively paved pedestrian walkways
- formal cycling routes
- new pedestrian bridges across the Spruit
- hardy street furniture
- proper and innovative lighting
- effective and widely distributed refuse bins
- designated braai areas with regulated braai facilities
- designated areas for spontaneous activities, such as musical and theatrical performances

Other and longer-term facilities could include a tourist-cum-information kiosk, restaurants, even an art gallery and an area for selling curios. Thoughtful landscaping of resilient, endemic planting would contribute to a well-considered park, featuring only the highest quality of design.

The ultimate objective is that the successful activation of this portion of the Green Spine would prompt the continuance of the Community Park along Walker Spruit into Sunnyside and beyond. Design inspiration could thereupon be drawn from other Tshwane artists, while expanding the range of activities and also encouraging agricultural gardens.

In considering the work covered by this dissertation, the Consortium Fook Framework therefore, would form an integral part of the proposed framework. This is important as the Clydesdale community is already excited about the possibilities this project has to offer (interview: Williams, May 2012). The elements discussed in the Consortium Fook Framework above would thus be included as part of the design guidelines, while the proposal of this dissertation in particular would add a new layer to this framework with the mindframe that open space may be seen as having value beyond the recreational and aesthetic purposes generally ascribed to it (Hough, 1984:216). It is agreed that the Walker Spruit is, indeed, an eyesore in need of beautification. However, this area holds so much more potential in terms of utilizing its resources and being productive. This will highlight the area as an asset, motivating the authorities all the more to assist with it coming to fruition. The dissertation will thus add a multifunctional dynamic to this inspiring framework, as discussed in the theoretical *Chapter 2*.

## CHAPTER 3: CONTEXT

### Mandela Development Corridor Framework (MDC) by GAPP Architects and Urban Designers, 2009.

The Mandela Development Corridor sits at the epicentre of the inner city within the intersection of most of Pretoria's major northern, southern, eastern and western thoroughfares. The heart of this framework is at the confluence of the Walker Spruit with the Apies River. What's more, the city's newly developed DTI Campus has become the catalyst for the redevelopment of the entire area, as well as sections of neighbouring areas.

Pedestrian connections and green corridors along the Apies River link the site into its urban context with the CBD to the west and Sunnyside to the east. The Mandela Corridor is therefore a major development opportunity and is a 'seam' that connects these important parts of the inner city.

From north to south the following uses are proposed:

- Student accommodation and tertiary education facilities
- High income apartments and residential development
- Caledonian Hotel and conferencing – with mixed use retail, auditorium facilities and events park
- Interchange transport and parking facility /mixed use commercial & housing
- Mixed use commercial and government buildings
- Culture and Tourism district centre, including office and studio facilities



Illustration 76: 'Proposed Action Plan' of the Mandela Development Corridor (GAPP Architects and Urban Designers, 2009:118).

### SYNTHESIS OF INVESTIGATION:

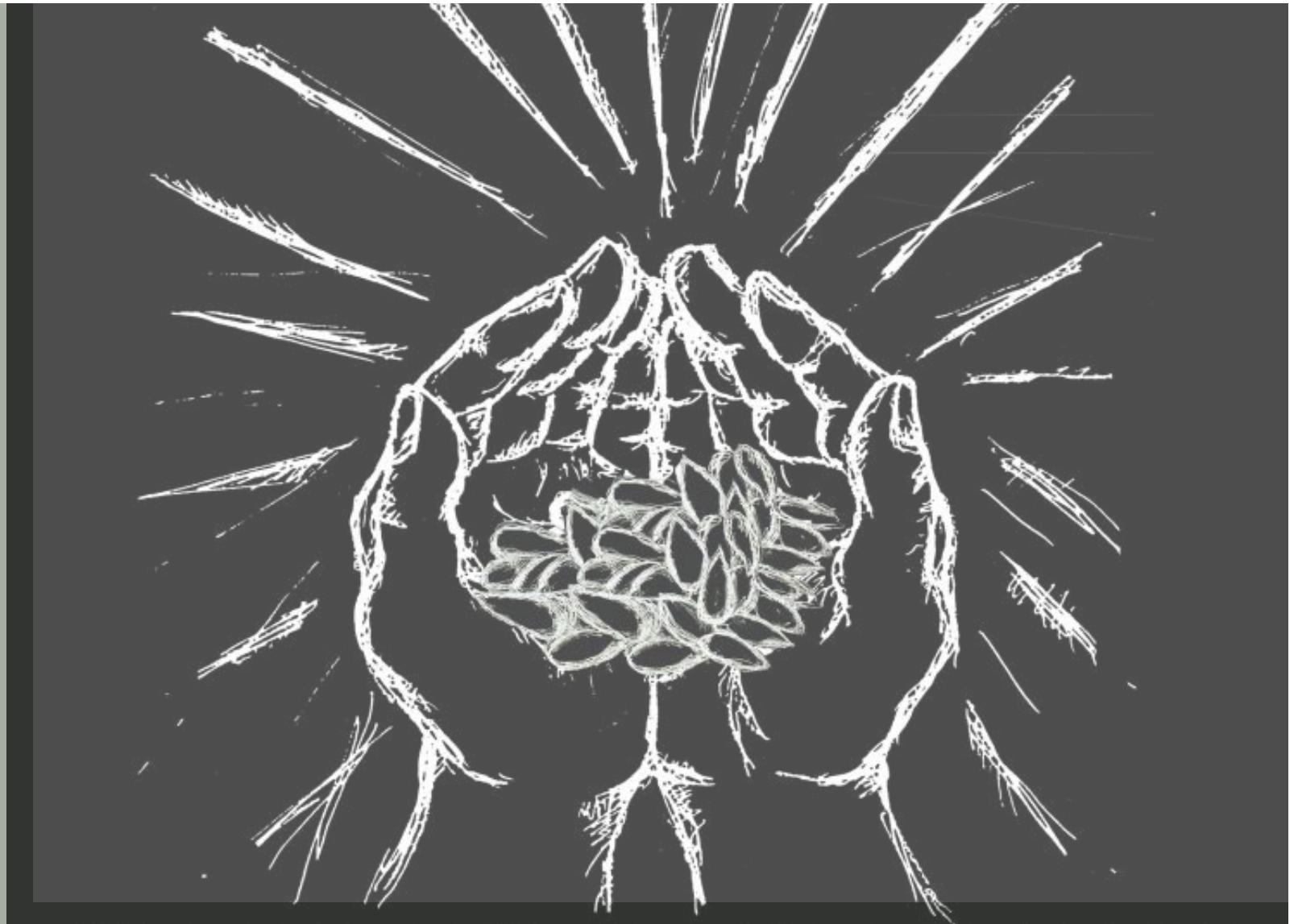
The contextual investigation has been synthesized and summarized into the following over-arching goals:

- 1. The historical layer of the area should be revealed in order to pay tribute to its heritage**
- 2. Job creation and community integration should be provided for in the recreational facilities provided, simultaneously increasing the safety of the area**
- 3. The Walker Spruit ought to be ecologically restored as much as possible**



*'Most of the resources we will need for upgrading are probably all in place, if only we could find them and mobilize them all'*

*(Hamdi, 2010:35).*



4

SITE ANALYSIS

Illustration 77: Poster for a seed exchange event in Toronto, organised by NGO 'Occupy Gardens,' February 2012 (From: <http://transitiontoronto.ning.com/events/occupy-seed-exchange>)

## SITE ANALYSIS

### INTRODUCTION

Sunnyside is one of Pretoria's only high-density, high rise residential areas. Conversely, Clydesdale is a low-density residential area with certified heritage significance (see Chapter 3: 'Context') This chapter focuses on the selected site's status quo in detail in order to inform the dissertation design itself. It hence focuses on the quantitative aspects of the site. Potentials, opportunities and needs will be established, while challenges and limitations will be identified. This will ensure that the resultant design is responsive to existing conditions.

### MACRO CONTEXT

Illustration 82 shows services and transport networks in broad scale. On the far west of the focus area is a CTMM power station which supplies the main electrical supply of the CBD, thus becoming an important landmark. The railway line forms the border of the southern section of Sunnyside, while the railway stations possess potential to form linkages and lead one towards the open space of the focus area in the form of landscaped boulevards. The bus stops closer to the site may also form part of these linkages, encouraging the use of the proposed extended pedestrian route to get from A to B in the city. This diagram also indicates how the Apies River (west) and the Walker Spruit (east) form the spatial boundaries of the Sunnyside suburb.

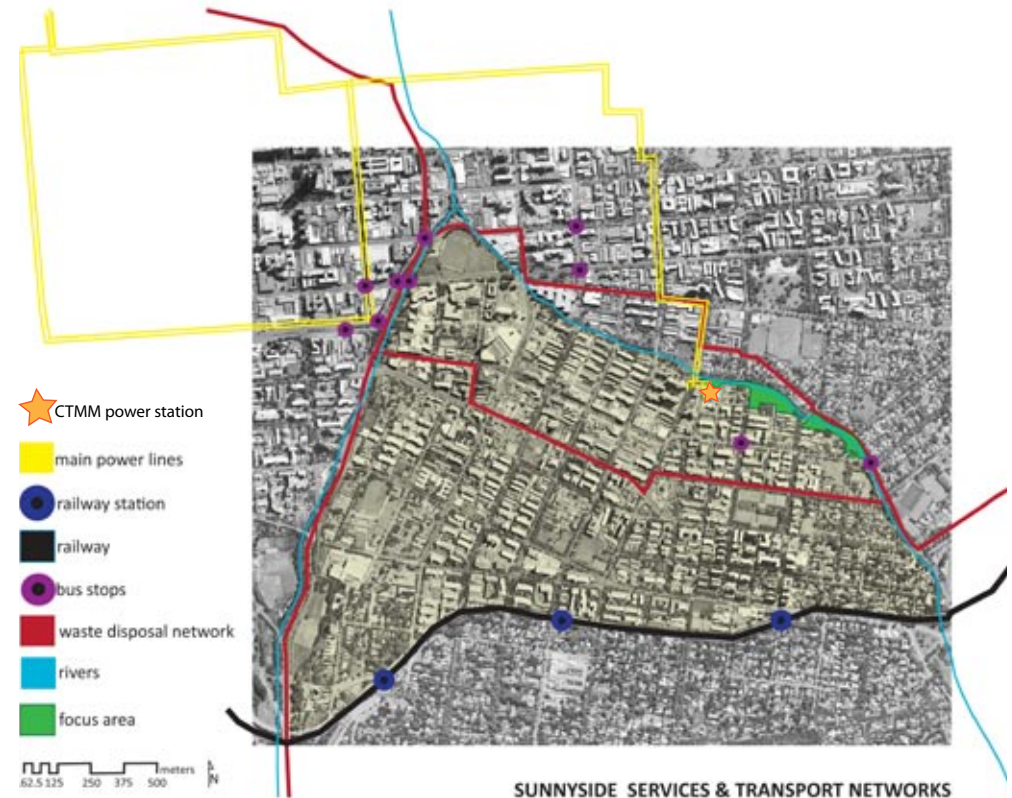


Illustration 78: Site in macro-scale indicating the interconnection of services & transport networks (Compiled from the University of Pretoria's Geography Department by Author, 2012).

### CLIMATE

Refer to illustrations 83 and 84:

- **Rainfall:** December and January are the wettest months with thunderstorms occurring frequently. Adequate provision for stormwater run-off as well as shelter from sudden rainstorms therefore need to be provided for.
- **Temperature:** Summers can be very hot with temperatures reaching the lower thirties. This implies that the provision of shade is of utmost importance.
- **Humidity:** Ranges from 47% in September to 69% in March. This falls within a comfortable range for humans and no compensating measures need to be taken.
- **Sun Angles:** The late afternoons during the summer months will receive shade from the high rise flats of Sunnyside East, this would be a welcome relief from the summer's heat and does not have any detrimental effects to any urban agriculture grown. During the winter months, the single-storey residential houses of Clydesdale towards the north will have little impact on the site as shadows of their boundary walls will merely cast small shadows onto the areas directly beneath them.

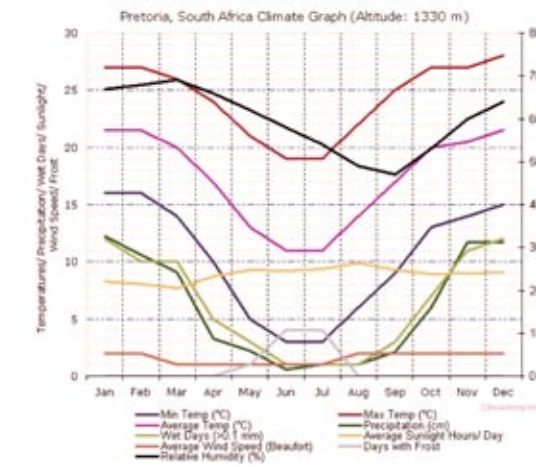


Illustration 79: Climate graph for Pretoria (Climate-Charts, 2010).

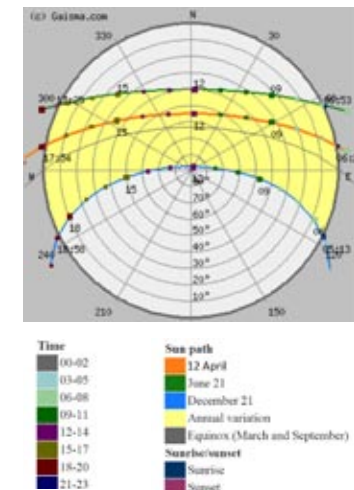


Illustration 80: Sun angles for Pretoria (Gaisma, n.d)

## PHYSICAL CHARACTERISTICS

### Visual Analysis

The visual analysis below indicates the photo-documentation of a transect walk through the site. This was done during off-peak office hours (ie. during the week between the hours of 17h00 and 18h00, and during the weekend), when the site should have been a hive of activity. Alas, no social atmosphere was present due to the sheer lack of people. The panoramics of the visual analysis indicate the underutilization of the site, the canalized Walker Spruit and the indigenous trees planted by municipality as a valid, yet minimal attempt to beautify the area. The Walker Spruit together with the pedestrian walkway lead one to a strong linear sense of movement through the site.



*The high rise resident flats of Sunnyside East encroach the site further West*



*The urban trail ('Kerneels Young Hiking Trail') adjacent to the Walker Spruit*



*Dotted trees on an abandoned lawn*



*Adjacent residences turn their backs to the eyesore of the canalized spruit*



*Unused lawn area, degraded urban trail and the canalized Walker Spruit*



*Informal and unused recycling station on the corner of Spuy and Walton Jameson Streets*

Illustration 81: Visual Analysis (Author, 2012).

## CHAPTER 4: SITE ANALYSIS

The site has an unsafe atmosphere which is emphasized by its isolation and general lack of care and maintenance. The Kerneels Young Hiking Trail (see also: *Chapter 3: 'Context'*) is in a bad state of disrepair as it is disintegrating, covered with weeds, and sometimes even obstructed by fallen branches (see *illustration 88*). Offensive graffiti covers the boundary walls, making visitors to the site feel threatened and unwelcome (see *illustration 91*).

Frequent occupants of the site consist of pedestrian citizens merely passing through the area, to get from A to B. However, most citizens prefer to walk along the street edges away from the site as it is considered safer. Other occupants include vagrants and municipal workers taking a nap or a lunch break (see *illustrations 86 and 90*). Many vagrants sleep under the bridges crossing the Walker Spruit at night, while some have been spotted bathing in the spruit during the day. Other visitors to the site include groups of teenagers for social or church gatherings. These seem to occur, however, on the street edges of the site where a sense of safety is given as opposed to the isolation of the area further away (see *illustration 89*).

A defining feature of the site, the Walker Spruit, has been considered an eyesore by many since its canalisation in the 1920's (refer to *Chapter 3: 'Context'*). Also in a devastating condition of disrepair, the concrete channel, like the urban trail, is collapsing and being taken over by weeds. There is no sign of riverine ecology. This is shown in *illustration 87*.

In general, the visual analysis of the site shows that it is in dire need of a total revampment and repair. As a first impression, the focus area of this dissertation has no sense of place or belonging. This lost space is a prime example of public land that the municipality has forgotten, due to lack of funding.



*Illustration 82: The site is dotted with napping vagrants during the day, as primary dwelling visitors to the site (Author, April 2012)*



*Illustration 83: The current state of the Walker Spruit (Author, April 2012).*



*Illustration 84: The Kerneels Young Hiking Trail is in a bad state of neglect and disrepair (Author, April 2012)*



*Illustration 85: Youth gathering for an afternoon church meeting (Author, April 2012)*



*Illustration 86: Napping homeless dwellers characterize the site as 'idle and unproductive' (Author, April 2012)*



*Illustration 87: Offensive graffiti intermittently displayed along the boundary walls looking on to the site (Author, April 2012)*

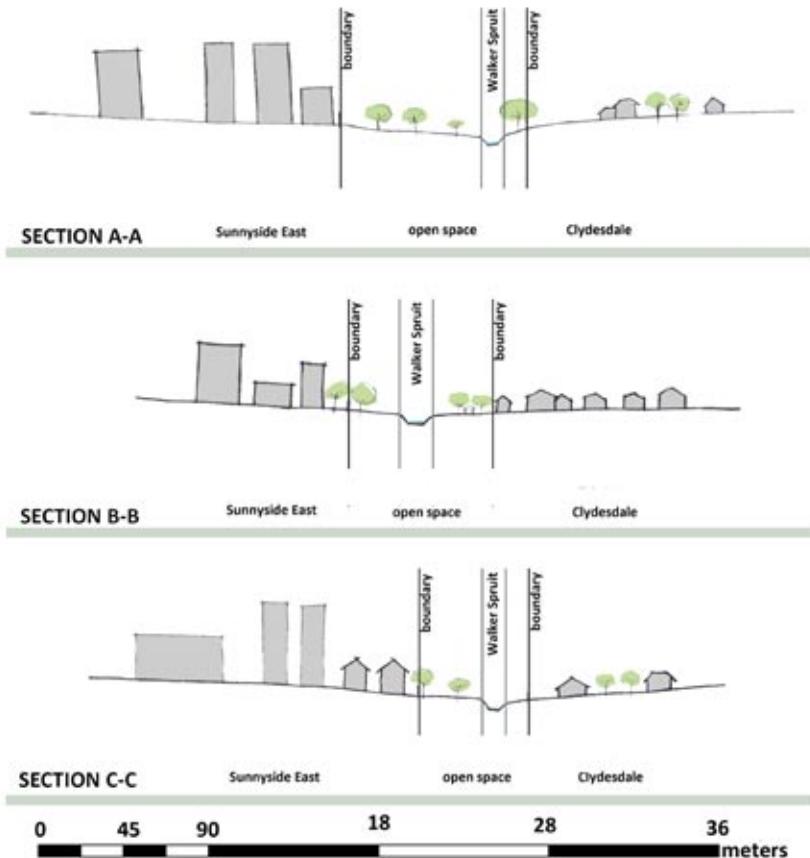


Illustration 88: General cross sections through the focus area, indicating the isolation of the open space (Author, 2012)

### Cross Sectional Analysis

The cross sectional analysis indicates the relative slope of the site towards the Walker Spruit. The general cross sections indicate how the open space of the focus area is defined by the density of the built fabric bordering the site. It is unfortunate, however, that residences turn their backs on the open space since the Walker Spruit and general unkept atmosphere of the space is undesirable as a view. This is also possibly due to the area being regarded as unsafe, as boundary fences for security further inhibit access onto the site. The space varies from narrow and linear and opens up more in terms of space towards the north west, as indicated in section A-A. Dotted trees do little to give the area a sense of place.

### Spatial Context Analysis

The nolli map shows how the focus area is essentially an 'island' of open space, which is much needed within the density of the suburbs, but is sadly forgotten. Vast expanses of lawn possess inherent potential to become something more: something productive that contributes towards the city and pulls the communities together. A three-dimensional sketch by the ISDF framework (1999) (illustration 94) shows the Walker Spruit Linear open space in its urban context. This highlights the area's potential for becoming a green corridor within the city fabric.



Illustration 89: Nolli Map of focus area (Author, 2012).



Illustration 90: 3-Dimensional sketch of the Walker Spruit linear open space slicing through the city (ISDF, Part 3, 1999:47).

CHAPTER 4: SITE ANALYSIS

Existing Layers of the Focus Area

SUBURBS & ERVEN OWNERSHIP



-  private zoning holding potential for public use
-  municipal zoning
-  special zoning



For the design of the park, several erven currently belonging to the municipality will need to be consolidated. The circled area indicates an abandoned backyard which is proposed to be reclaimed by municipality, thereby increasing productive community open space.

Illustration 91: Suburbs & Erven Ownership (Author, 2012)

AMENITIES

-  Established amenity
-  focus area

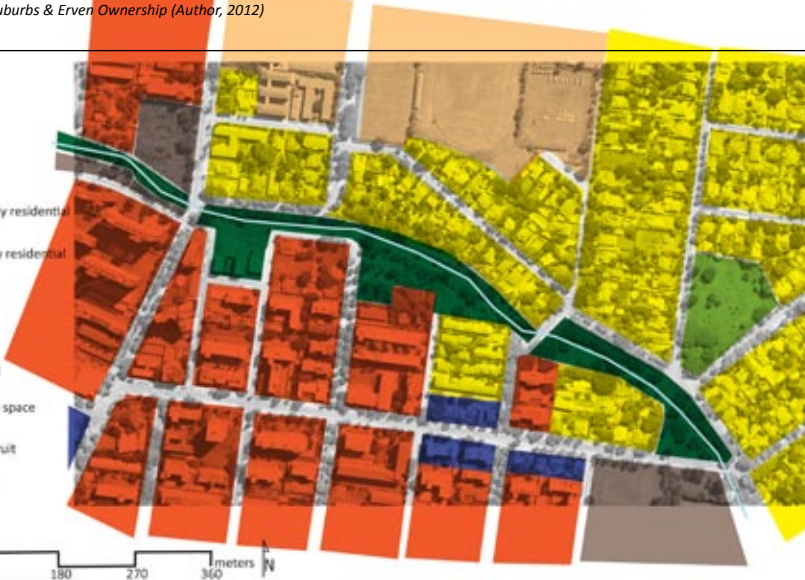


The focus area is situated amongst multiple educational facilities (including the University of Pretoria, Pretoria Boys and Girls High, Seuns Hoër and Meisies Hoër as seen in the 'Sunnyside Precinct' map, Chapter 5: 'Framework') which hold potential to be integrated into the design programme.

Illustration 92: Amenities (Author, 2012)

ZONING

-  High density residential
-  Low density residential
-  Business
-  Special
-  Educational
-  Public open space
-  Walkers Spruit
-  Municipal



The focus area is situated in a primarily residential zone as it is bordered by high-density residential buildings of Sunnyside to the South, and low-density residential houses of Clydesdale to the North. Pedestrian-wise, an allotment farming scheme will therefore be feasible.

Illustration 93: Zoning (Author, 2012)

ROAD NETWORK

-  established vehicular roads
-  Walkers Spruit
-  focus area



Bourke St, Minni St & Spuy St cross over the spruit. It is interesting to note how some streets lie perpendicular to the spruit, resembling the historic layout of farm furrows.

Illustration 94: Road Network (Author, 2012)



Numerous indigenous trees have been planted by the municipality on the site in 2001. However, few people linger to enjoy their shade and beauty besides the homeless vagrants. Because they are still relatively small, they may be transplanted to make way for a design intervention where need be.

Illustration 95: Vegetation (Author,



Numerous stormwater pipes connect to the canalized Spruit. The spruit has thus essentially become a stormwater channel. Infrastructure above sewer lines and structures needs to be avoided.

Illustration 96: Services (Author, 2012)



The 'Kerneels Young Hiking Trail' stitches the open space together along the Walker Spruit. This is used mostly by Sunnyside residents before/after working hours and during lunch hour. This is, however, in need of an upgrade as it has been badly maintained. There are 3 small pedestrian bridges crossing the spruit, including those of the 3 intersecting roads. There are thus enough existing crossing points for access.

Illustration 97: Pedestrian Movement (Author, 2012)



Floodlines have been drastically altered by the channelization of the Spruit, resulting the establishment of erfs within the 1:50 year and 1:100 year floodlines. Therefore, the river cannot be restored to its exact natural state, unless multiple houses and flats are demolished. This is not economically viable.

Illustration 98: Floodlines (City of Tshwane Roads and Stormwater Dept, manipulated by Author, 2012).

CHAPTER 4: SITE ANALYSIS



Illustration 99: The weed-infested concrete channel of the Walker Spruit at its base flow. Note the trapezoidal cross-section. (Author, May 2012)



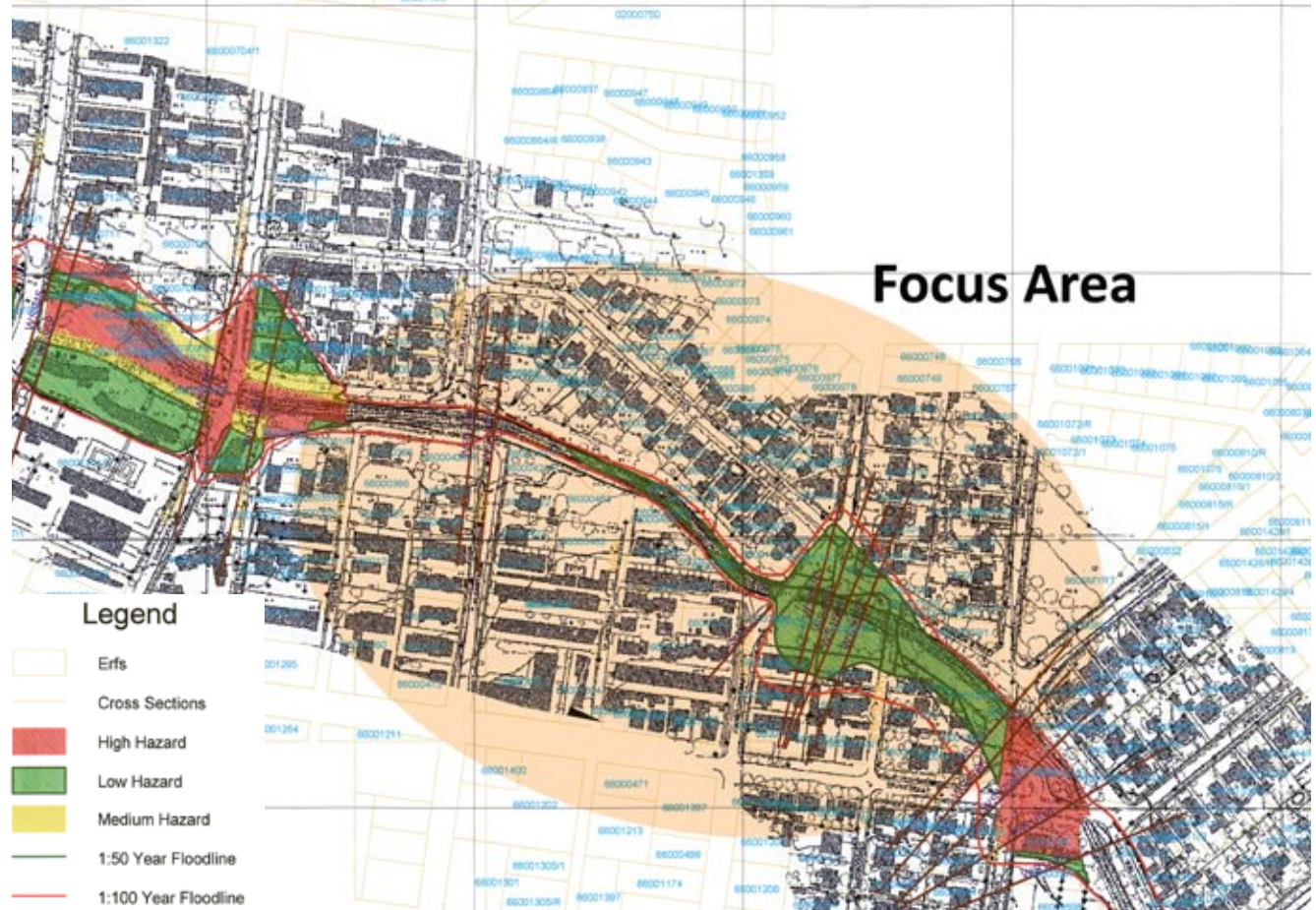
Illustration 101: A vagrant's dwelling beneath the bridge crossing of Spuy Street. Note the rectangular cross section (Author, April 2012)



Illustration 102: Existing pedestrian bridges over the Walker Spruit of Victorian influence (Author, April 2012)



Illustration 100: Litter strewn across the site and dumped in the Spruit (Author, May 2012)





## The State of the Walker Spruit Channel

The Walker Spruit is in a state of disrepair. The concrete lined canal has diminished any sign of ecology within the riverine system. It is also viewed as an eyesore in the area as little maintenance has been done to keep the canal in a stately condition. As weeds grow through the revetments of the concrete, floating branches, litter and debris make the channel a depressing site. What's more, the canal is collapsing due to turbulence of the water during episodes of high peak flows (refer to illustration 105). Intermittent flooding has previously been reported. However, it has been proven via an hydraulic model (in the Hydraulics Laboratory of the University of Stellenbosch by Sigma Beta consulting engineers, 1993), that the canalized portion of the Walker Spruit would, in general, convey the estimated 1:100 year peak flow rate if it weren't for the transition sections at various bridge crossings along the route of the canal. According to civil engineers Chunnet, Fourie and Partners (1993:1), the problems experienced at these crossings are due to the short, hydraulically inadequate transition sections which occur between the trapezoidal canal (see illustration 103) and the rectangular bridge open-

ings (see illustration 106). These bridge openings have caused unfavorable flow conditions, where flooding of the streets occur at these bridge crossings.

Recommendations to this problem include that the canal depth be increased locally at the anticipated location of the standing waves downstream of the transitions, as well as increasing the wall height where curved transitions occur. This would enable the canal to convey the full 1:50 year flow rate without over topping (Chunnet *et al*, 1993:34). Furthermore, a trapezoidal channel profile has been proposed to be carried through the previously rectangular bridge openings to maintain a sturdy and consistent cross section. Grass berms have also been recommended.

Later reports add that the removal of overhanging trees, repair of isolated areas of erosion above the concrete lining, and minor repairs to the concrete lining in isolated areas are needed (BKS Water Division, 1999). Risk of flooding and erosion are also caused by floating branches and debris blocking the bridge openings.

It is now thirteen years later, and the Spruit still lies untouched as municipal funds are lacking. The proposed design intervention, however, should take all the professional recommendations into account.

## The Water Quality of the Walker Spruit

An analysis on the water quality of the Walker Spruit was last taken in the year 2000 by the city's Water Research Laboratory. In considering the resultant table in illustration 110; it has been deduced that pollutants such as oils are of a very low percentage, whilst solid pollutants, such as floating debris is of primary concern. Expensive filtering infrastructure such as oil traps are thus unnecessary, whilst floating debris will be greatly decreased once a sense of place and general respect for the area is established. According to Ahlers (2006:118), the water quality of the spruit seems to be within the limit to sustain a healthy aquatic ecosystem. The design intervention can most definitely improve this through the establishment of selected aquatic vegetation, thereby filtering and improving the water quality as a whole.

As both the Clydesdale and Sunnyside East communities are passionate about the area, one should remain positive, yet still be realistic. Involving the local communities will further enhance the motivation of the authorities, while the notion of a productive landscape that is essentially self-sustaining may further entice prospective clients to invest in the potential this dormant site has to offer.

Recurrence Intervals	Walker Spruit @ Railway Line (m3/s)	Walker Spruit @ Troye Street (m3/s)
1:2 years	20.7	24.2
1:5 years	38.9	45.0
1:10 years	53.5	62.1
1:20 years	70.0	81.4
1:50 years	95.0	110.4
1:100 years	116.6	135.5
1:200 years	140.8	163.0

Illustration 103: The peak flows and recurrence intervals of the Walker Spruit (Tshwane Roads and Stormwater Department, 2012).

Walker Spruit before Apies River	1997	1998	1999	Average
Suspended Solids (mg/l)	49.78	13.50	8.47	23.92
pH	8.44	8.56	8.19	8.40
Conductivity (mS/m)	49.13	44.59	40.85	44.85
Chloride (mg/l)	37.45	39.83	37.17	38.15
OA (mg/l)	5.07	1.83	2.03	2.98
COD (mg/l)	40.44	14.17	24.67	26.42
Ammonia (mg/l)	0.33	0.16	0.08	0.19
Phosphate (mg/l)	0.46	0.17	0.10	0.24
Nitrate Nitrogen as N (mg/l)	2.41	2.21	1.74	2.12
TOC (mg/l)	15.06	9.48	10.61	11.72
DO (mg/l)	8.20	8.09	7.36	7.88
Temperature (°C)	15.89	19.74	19.39	18.34
E. coli	18.64			

Illustration 106: Water Quality of the Walker Spruit before the Apies River Junction (Water Research Laboratory, 2000: no page number).

Illustration 104: Collapsing Channels of the Walker Spruit (Author, May 2012)

Illustration 105: 1:50 Year detail hazard assessment for the Walker Spruit in the context of the dissertation's 'low hazard' focus area (SRK Consulting Engineers and Scientists, 2001).

## BIOPHYSICAL CHARACTERISTICS

### Geology

The site is made up of shale. Since this rock type can be very soft, other stabilizing materials need to be added when structures are built on it. Refer to *illustration 111*.

### Soil Analysis

A broad description according to MacVicar *et al* (1977) states that the soils of the focus area are red and yellow, dystrophic and/or mesotrophic, apedal soils with plinthic subsoils. *Illustration 116* shows the soil type of the focus area within its surrounding context. With an average topsoil clay content of 25,1-35% ('excessively-drained soils'), the general agricultural potential of the focus area is good. This class is rated 4th out of 17 soil category classes, ranging for best to worst in agricultural potential. It is said that these soils drain well, therefore they are good for farming purposes. They have moderate soil erosion potential.

In *Chapter 2: 'Theory,'* the notions of permaculture and agroforestry have been explored. These agricultural 'food forest' techniques are said to improve the conditions of the soil through nitrogen-fixing species such as beans and alfalfa. The intercropping promoted here also decreases the chance of soil erosion. Moreover, through the composting of organic waste, the nutrition and fertility of the soil will be enhanced and improved even more.

### Vegetation

Mucina and Rutherford (2006:466-467) describe the endemic natural vegetation of the area as Gauteng Shale Mountain Bushveld. Examples of dominant plants of this vegetation type consist of *Combretum molle*, *Dombeya rotundifolia*, *Protea Caffra* and *Acacia Karoo* (see *illustrations 112-115*) amongst others. However, the area today is classified as disturbed urban temperate bushveld (UP Department of Geography, 2012).

Existing trees of the area have been mapped in *illustration 99*. It has been found that the larger trees tend to be those that are exotic species, such as *Pinus taeda*, *Jacaranda mimosifolia* and *Tipuana tipu*. The

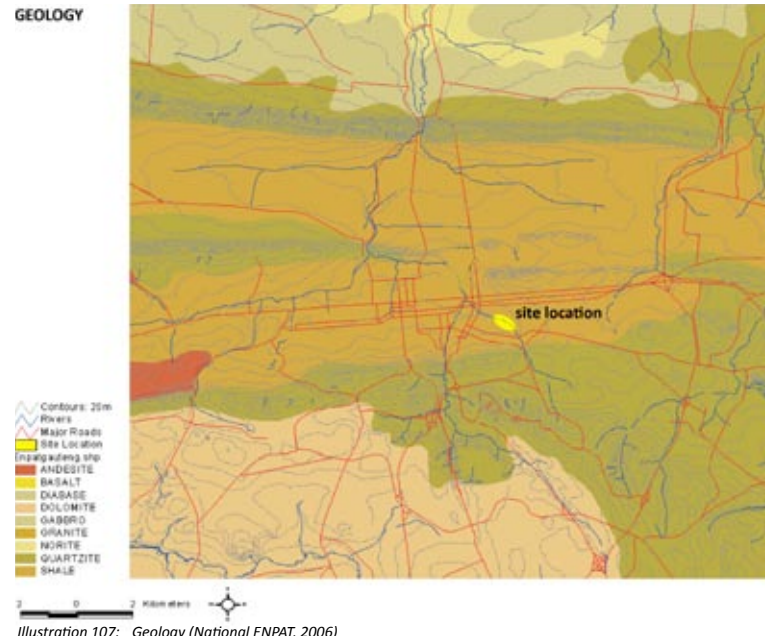


Illustration 107: Geology (National ENPAT, 2006)

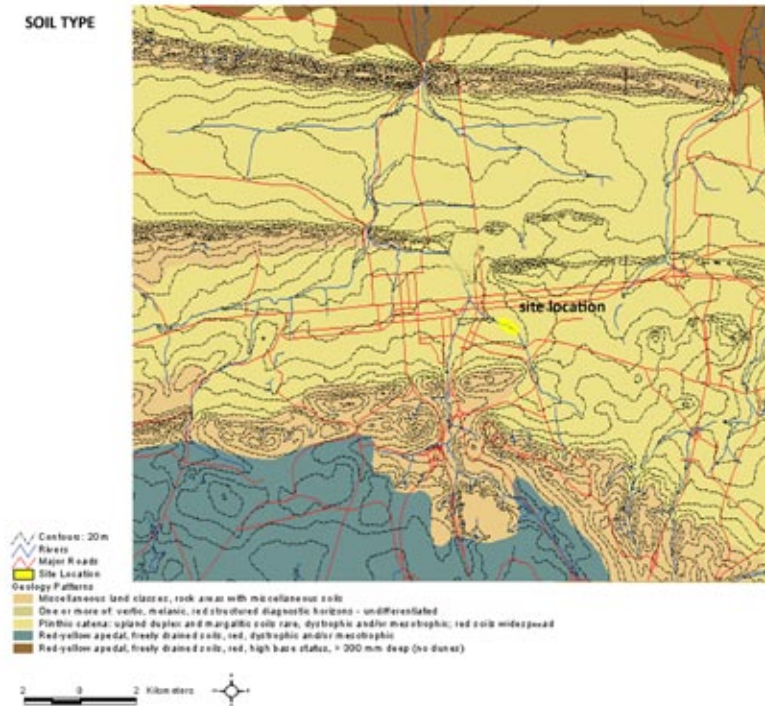


Illustration 112: Soil type (National ENPAT, 2006)



Illustration 108: *Combretum molle* (From: <http://plantzafrica.co.za>)



Illustration 109: *Dombeya rotundifolia* (From: <http://plantzafrica.com>)



Illustration 110: *Protea caffra* (From: <http://www.ispot.org.za/node/143912>)



Illustration 111: *Acacia karoo* (From: <http://plantzafrica.com>)

two *Phoenix canariensis* palms on site were planted in the 1920's at the same time as the palms were planted along University Road to commemorate the discovery of Tutankhamun's Tomb. They are thus of historical significance. Sadly, a majority of the species within the area have been killed by a virus between 2005 and 2012. An array of indigenous species such as *Rhus lancea*, *Celtis africana*, *Acacia caffra* and *Combretum erythrophyllum* have recently been planted by municipality in 2001. These are still relatively young enough to transplant where the need arises.

Apart from trees, the remaining surface of the site is covered with a mixture of *Cynodon dactylon* and *Pennisetum clandestinum* (kikuyu) lawn, with some low-growing weeds.

## LEGAL ISSUES

### Legislation that effects the project

According to Absalom Malobe of the City of Tshwane Department of Environmental Affairs (interview: 2012), three approvals will be needed in order for the proposal to be brought forward:

1. Tshwane Open Space Framework (TOSF) approval in terms of fitting in with the requirements of the city's open space plan.
2. Tshwane Department of Water Affairs approval in terms of a water licence for developing along the Walker Spruit.
3. Tshwane Department of Agriculture approval for the proposal of establishing community allotment gardens in the area.

An Environmental Impact Assessment (EIA) would also need to be carried through in the area with a special focus on the impact of revamping and developing along the Walker Spruit.



Illustration 113: The Walker Spruit CID (Author, 2012)

## Built-to Lines

According to the South African City Planning and Development Division (2008:32), built-to lines are 4.5 metres on all boundary sides.

## SECURITY

### The Walker Spruit City Improvement District (CID)

The Walker Spruit's newly-implemented City Improvement District (CID) has employed 24 hour guards to monitor the length of the Spruit along Clydesdale and Sunnyside East. It is proclaimed that the premises are monitored by 24 hour CCTV, as indicated in *illustration 117*. There is strong involvement from both the Clydesdale and Sunnyside East community associations in improving the safety of the area. The Walker Spruit CID also serves to facilitate crowd control during sports events at the Loftus Versveld Sports Stadium.

### Status quo of the security situation

The majority of crime in the area involves petty theft and vandalism of Tshwane council property. There is also a problem of vagrants along the Spruit who sleep under the bridges during low flow periods. It is of the author's opinion that crime is experienced in the area due to the sheer lack of facilities, maintenance and care. As a result, the area lies derelict and attracts instead that which is undesirable.

### Improving the security situation through design

The provision of facilities within the open space will attract more people to the area, providing passive surveillance. Improved lighting along the length of the Kerneels Young Hiking Trail may serve to facilitate a greater sense of security for early morning and evening passers-by. Additional benches will encourage lunch-goers to the area during business hours. Furthermore, the crime situation will be improved through regular maintenance and an upgrade of the area. With the aid of responsive design intervention, access, safety and legibility of the area may be improved in order to reveal and recover the site to its surrounding citizens. An improved sense of place facilitated by the design will provide pleasant views onto the site and building edges may, with time, no longer turn their backs on to the site, as overlooking windows and balconies provide further passive surveillance. Additionally, it is believed that involving the community will initiate a greater sense of ownership (see *Chapter 3: 'Theory'*), while liabilities of the authority may be relieved.

## CONCLUSION

The site analysis has indicated the relative opportunities and constraints presented by the selected focus area, as presented in the table below. The strong linearity brought about by the Walker Spruit, the Kerneels Young Hiking Trail and the general geometry of the site endow the site with a sense of movement. Thus the need for the revampment of the Kerneels Young Hiking Trail along with more pedestrian bridges may also provide the impetus to for extension into a larger scale CPUL in the future, as it connects similar fragments of unutilized land together for their productive potential.

<i><b>OPPORTUNITIES</b></i>	<i><b>CONSTRAINTS</b></i>
<i>A SENSE OF ECOLOGY AND BEAUTIFICATION CAN BE RETURNED TO THE WALKER SPRUIT</i>	<i>DE-CANALIZATION WILL PROVE COSTLY AND ALTER THE SITE CONDITIONS</i>
<i>THE KERNEELS YOUNG HIKING TRAIL CAN BE REVAMPED AND EXTENDED AS A CYCLING AND PEDESTRIAN ROUTE</i>	<i>THE URBAN TRAIL WILL NEED TO BE WIDENED CONSIDERABLY, WHILE SAFE CROSSING ZONES BETWEEN ROAD INTERSECTIONS &amp; THE SPRUIT NEED TO BE RESOLVED</i>
<i>EXISTING LARGE INDIGENOUS AND EXOTIC TREES PROVIDE SHADE, SEQUESTER CARBON AND PEPPER THE SITE</i>	<i>SOME OF THE YOUNGER TREES WILL NEED TO BE TRANSPLANTED WHERE POSSIBLE. LARGE SPECIES NEED TO BE CONSERVED &amp; INCORPORATED IN THE DESIGN</i>
<i>A DESIGN INTERVENTION IMPROVING LEGIBILITY, ACCESS &amp; PASSIVE SURVEILLANCE WILL IMPROVE THE SECURITY OF THE AREA</i>	<i>THE SAFETY AND SECURITY OF THE AREA IS AT RISK</i>
<i>URBAN AGRICULTURE WILL PROVIDE JOB OPPORTUNITIES AND FOOD SECURITY FOR VAGRANTS</i>	<i>VAGRANTS ARE PRIMARY OCCUPANTS TO THE SITE</i>

Illustration 114: Summarized opportunities and constraints of the focus area (Author, 2012)

## SYNTHESIS OF INVESTIGATION:

- 1. The ecological functions of the site need to be restored**
- 2. Access, legibility and connection of the site must be improved**
- 3. Safety of the area will be improved by providing job-creating facilities such as restaurants, coffee shops, community centres and benches, attracting more people to the area and providing passive surveillance**
- 4. In areas where agriculture is to be zoned, small existing trees need to be transplanted, while large existing trees must be conserved where possible**
- 5. Regionally indigenous species of the Gauteng Mountain Bushveld should be used in the planting palette**

*“There are in reality not only, as is so constantly assumed, two alternatives — town life and country life — but a third alternative, in which all the advantages of the most energetic and active town life, with all the beauty and delight of the country, may be secured in perfect combination; and the certainty of being able to live this life will be the magnet which will produce the effect for which we are all striving — the spontaneous movement of the people from our crowded cities to the bosom of our kindly mother earth, at once the source of life, of happiness, of wealth, and of power.”*

(Howard, 1902:15)



# PRECEDENT STUDIES

## PRECEDENT STUDIES

### INTRODUCTION

The following precedent studies are successful and recently established examples of productive, multifunctional landscapes. Precedents of a theoretical departure have been explored, as Viljoen's LeisureESCAPE exposes the possibilities of a continuous landscape from a framework point of view. The movement of Guerilla Gardening has also been discussed, in exploring the success of independent community involvement in improving the city environment. The international precedent of Sagrera Linear Park, by West 8 landscape architects in Barcelona, demonstrates how one may go about designing for a strip of land within the urban fabric. Furthermore, James Corner's Shelby Farms Park in Memphis, Tennessee, is a recent (and possibly one of the first) multifunctional landscapes with a productive emphasis, meaningfully designed by a landscape architect.

This investigation culminates in a case study of the success of the allotment gardens in Zurich, Switzerland, as a model for the productive and social purposes of this dissertation's design.



Illustration 116: LeisureEscape, London. A theoretical CPUL envision by Bohn and Viljoen (2005:289-291).

### Theoretical Precedent:

## 'LeisureESCAPE,' London, Southwark (A Continuous Productive Urban Landscape, 'CPUL')

By Andre Viljoen, 2005

### Description

Applicable to any urban environment, but most needed in large cities, the theoretical London 'LeisureESCAPE' devised by architects Andre Viljoen and Karin Bohn forms a Continuous Productive Urban Landscape or 'CPUL' (as discussed in Chapter 2: 'Theory'). Running from outside London to the Thames and to outside London again, LeisureESCAPE enables city dwellers to escape into the countryside and country dwellers to escape into the city. Bohn and Viljoen (2005) state that the CPUL works by interconnecting existing parcels of open land, such as parks, playing fields, brownfield sites, underused green spaces, public gardens, large car parks and the like in order to form a continuous landscape. This landscape turns roads into a unique productive landscape growing fruit and vegetables for the city dwellers own consumption. Agricultural fields in LeisureESCAPE are run both commercially and privately, thereby determining economic and social value. This landscape thus provides new employment opportunities in its large areas of commercial agriculture or adjacent leisure facilities.

### Prospects and ideas

Reclaiming and interconnecting the city's existing open space is a sustainable approach for rejuvenation, highly relevant for a city such as Tshwane, where budgets are limited. This linear landscape brings different leisure and open space areas into proximity with each other, providing for a multitude of occupations and activities for all age groups, social levels and genders. The landscape also provides for different activities throughout the day, thus ensuring maximum occupation and thus safety of the site. This is what is needed for the focus area of this dissertation in order to improve the area's safety and access. The CPUL delivers environmental factors through the continuity of the landscape into the countryside which provides for ecological corridors. This is an excellent precedent for providing a vision of what a multifunctional landscape may incrementally grow into within the larger picture, and can easily be applied to the city of Tshwane.

Theoretical Precedent:

The Movement of ‘Guerilla Gardening’

Description:

A mushrooming global movement dedicated to ‘fighting the filth with forks and flowers’ (Reynolds, 2012), Guerilla Gardening is an activist movement, where participants seek to transform vacant pieces of land in the city into enchanting islands of garden. Guerilla gardeners typically transform neglected areas in illegal, yet benign nocturnal interventions in order to beautify the urban environment. According to Walters (2012), the term was first used by activist group Green Guerillas when they transformed a New York City municipal lot into a vibrant community garden in 1973. Planted as a benevolent act of defiance, the Liz Christy garden has spawned 600 others across the Big Apple, all sprouted and tended by volunteers under the banner: “It’s your city, dig it.”

In South Africa, Guerilla Gardening Associations have recently started to develop as trendy pastimes for passionate urban dwellers. Associations such as ‘Secret Sowers SA’ (based in Port Elizabeth) and ‘The Secret Gardener’ (based in Cape Town) participate in nocturnal vigilante missions. Such missions have involved planting tomatoes and nasturtiums on littered municipal land, while mixes of flowers, herbs and drought-resistant succulents have been scattered along stretches of street islands and traffic circles. Rubbish lying on vacant parcels of land is typically removed, planted, and sometimes even interspersed with edible plants for food security so that people could pick as they walk past. Guerilla activists have planned to tend to the neglected parklands of our city where municipality lacks funding for proper maintenance (Walters, 2012).

Prospects and ideas

As a theoretical precedent, the Guerilla Gardening movement is an inspiration as to how, through a resilient and creative community group, the city may be beautified without relying on the municipal authorities. This is a source of inspiration for the Clydesdale and Sunnyside East communities. Activists of the campaign have proven that greening the city need not be an extensive, high cost endeavour. Through small scale intercessions, the lost spaces of the city may be recovered through the power and the social capital of the community themselves.

One may go about encouraging such an initiative using the focus area as a catalyst, in creating places where citizens are invited to partake in greening their environment. Individual allotment gardens will form part of a flexible framework which allows for the tenants own creativity.

CHOOSE YOUR FUTURE!

You’re being sold:

big box stores and little box apartments stacked on parking lots.

chain link fences and boarded-up empty buildings.

streets dominated by cars and traffic cycles.

603,000 NC children experiencing food insecurity every day.

... You can:

Create Gardens filled with native Flowers, medicinal herbs and Art.

Free Community Spaces for Sharing skills, resources, and meals

Reclaim arable land And Empty lots to Feed Everyone.

Live, Walk, and Cycle on Our streets and commons.

OR...

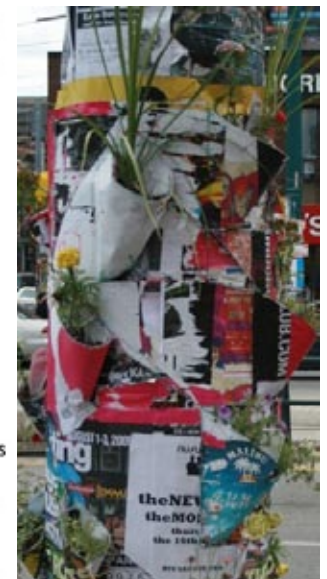


Illustration 118: ‘Green lamp post,’ London (From: <http://www.treehugger.com>)

Illustration 117: ‘Choose your future!’ Guerilla Foundation, New York, 2012 (From: <http://occupychapelhill.org>)



Illustration 120: ‘Before and after,’ Toronto, Canada (From: <http://justlive.us/physical/food/guerrilla-gardening-101/attachment/guerrilla-gardening/>)



Illustration 119: ‘Edible bus stop,’ London, 2012 (From: <http://thepotholegardener.com/>)



Illustration 121: Guerilla garden logo (From: <http://commons.us/physical/food/guerrilla-gardening-101/attachment/guerrilla-gardening/>)

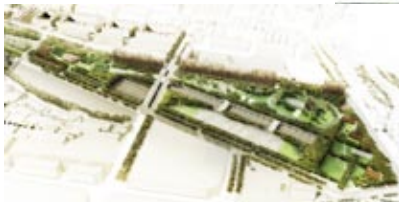


Illustration 122: 'Orchards and Sports Agora' (From: <http://www.west8.nl/>)



Illustration 123: 'Welcome Garden' (From: <http://www.west8.nl/>)



Illustration 124: 'Site map: 'Sea and Mountain, Nature and City'' (From: <http://www.west8.nl/>)



Illustration 126: Section through 'Cami Portal Fountain' (From: <http://www.west8.nl/>)



Illustration 125: View of the 'Cami Portal' from the pathway (From: <http://www.west8.nl/>)



Illustration 127: View of the 'Welcome Garden' (From: <http://www.west8.nl/>)

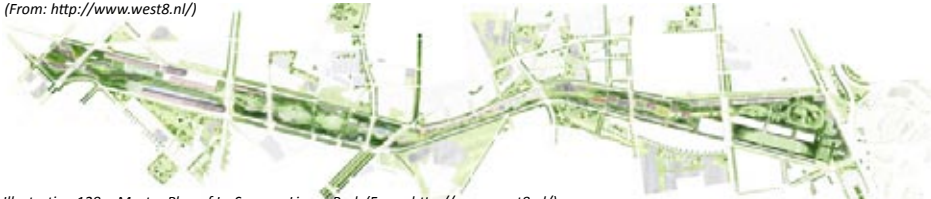


Illustration 128: Master Plan of La Sagrera Linear Park (From: <http://www.west8.nl/>)

## International Precedent:

### Sagrera Linear Park, Barcelona By West 8, Aldayjover and RCR, 2011

#### Description

A new tunnel route for the railway system of Barcelona has left a linear island of open space in the city which has been proposed to become a large scale linear park. This 40 hectare long 'green lung' is described as an urban connector which facilitates cross paths and articulates the environment, while public spaces are linked to provide continuity and a metropolitan scale. The new diagonal public green space is proposed to be the connection between the Catalan Pyrenees, the coastline, and the city itself. The design thus begins as a green track in the mountains, which continues as a 'Cami Portal Park' inside the city, which finally leads one towards the sea. The park thus connects the 'Sea and Mountain, Nature and City' (West 8, 2011), in order to improve biodiversity and the ecological role of the urban environment. Shaded walkways for pedestrians, bikers, and skaters connect the landscape which portrays the different neighborhoods of Sant Andreu and Sant Marti, El Clot Park, and the historical gardens of Ciutadella. The installation of fountains throughout the park territory represent the old historic system of the old Rec Comtal infrastructure which assisted in the city water supply (Oksana, 2011). The main goal of the La Sagrera Linear Park is part of a new 'slow' Barcelona initiative that brings relief to the urban rush of the active modern urban city, all the while retaining its strong historical identity.

#### Prospects and ideas

La Sagrera Park is an excellent precedent of a linear landscape which connects the city to its natural boundaries, in order to create an ecological corridor. This concept may be applied to the city of Tshwane, in building on the Open Space Framework (see *Chapter 3: 'Context'*). The masterplan demonstrates how various fragmented landscapes can be connected through the establishment of a pedestrian and cycling pathway as discussed in *Chapter 2: 'Theory.'* The history of the site is paid tribute to through the installation of water features, which brings a meaningful *genius loci* to the site. This idea could be brought forward in the focus area, with irrigation by means of a waterwheel. This could pay tribute to the heritage of the site, since it was once a farm. It must be acknowledged, however, that this is a first world precedent, as funds here were not problematic. But, by including the surrounding communities in the upgrading of their surrounding open space in the context of this dissertation, La Sagrera Park may become an inspiring vision in the broader picture.



International Precedent:

Shelby Farms Park, Memphis  
By James Corner Field Operations, 2008

Description

Field Operation’s design vision for Shelby Farm’s Park was a landscape of higher intensity and a variety of uses. As new entrances, pathways, and facilities were proposed, twelve distinctive landscapes each support certain uses and activities, allowing a coherent ‘place’ structure for the varied user groups set within a larger park setting. These landscapes include an orchard, a lake for water sports, a wind and solar farm and pastures, all interconnected and linked via an uninterrupted pedestrian circulation route. Additionally, Shelby Farms Park’s agricultural heritage has inspired a resource for land husbandry practices, including farming, research, energy, education and markets. James Corner (2008) states, ‘continuing the agricultural heritage of the site, the new park becomes a large-scale public place of cultivation, growth, production, health and wellbeing (as in a sports farm, an arts farm, a culture farm, an energy farm, a tree farm, as well as a land husbandry farm). In this way, traditional land practices are hybridized with 21st-century health and recreation uses, providing a new ecology of place.’

Prospects and ideas

The proposal of Shelby Farms Park demonstrates an example of what exactly a vernacular, multifunctional landscape may encompass. Like the contextual past of this dissertation focus area (see Chapter 3, ‘Context’), Shelby Farms Park, too, has an agricultural past. This element has been paid tribute to through continuing the heritage of the site as part of the concept of intensifying the land use of the space. The design is further enriched through educating the public with interrelated health and ecological issues, which are highly relevant and pressing issues today.

This precedent demonstrates the heightening awareness of human and ecological health in relation to the designed landscape. This landscape therefore forms precedent to the new and innovative uses the 21st century public park may offer. The culminating design of this dissertation may thus demonstrate the inherent possibility that such a landscape holds for the city of Tshwane.



Illustration 129: ‘Patriot Lake’ (From: <http://www.lotusenvironmentalblog.it/shelby-farms-park/>)



Illustration 130: Research Fields & Nursery (From: <http://www.lotusenvironmentalblog.it/shelby-farms-park/>)



Illustration 131: ‘The Range & Arboretum’ (From: <http://www.lotusenvironmentalblog.it/shelby-farms-park/>)

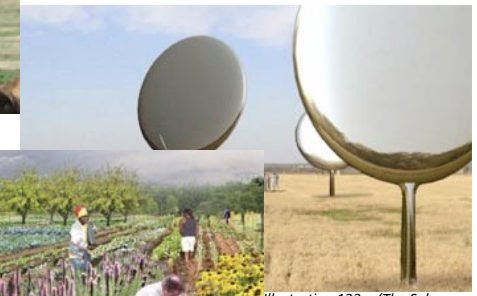


Illustration 133: ‘The Solar Farm’ (From: <http://www.lotusenvironmentalblog.it/shelby-farms-park/>)



Illustration 132: ‘Shelby Public Gardens’ (From: <http://www.lotusenvironmentalblog.it/>)



Illustration 134: ‘The Refuge’ (From: <http://www.lotusenvironmentalblog.it/shelby-farms-park/>)

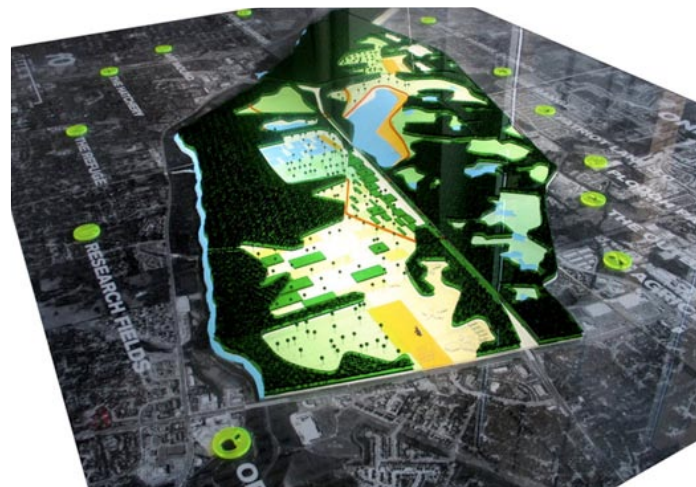


Illustration 135: Shelby Farms Park Masterplan (From: <http://www.lotusenvironmentalblog.it/shelby-farms-park/>)



Illustration 136: ‘The Agricenter’ Marketplace (From: <http://www.lotusenvironmentalblog.it/shelby-farms-park/>)



Illustration 137: Panoramic of the demonstration garden (Author, June 2012).

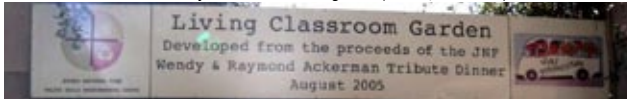


Illustration 138: The Living Classroom Garden (Author, June 2012).



Illustration 139: Educational signpost (Author, June 2012).



Illustration 140: Pathway through the garden (Author, June 2012).

Illustration 141: Exploring pathway (Author, June 2012).



Illustration 142: 98 year old Magda's allotment garden (Author, June 2012).



Illustration 143: Community Nursery of indigenous trees, established in 2011 (Author, June 2012).



Illustration 144: Allotment gardens of Mamelodi (Author, June 2012).

## South African Precedent:

### Walter Sisulu Environmental Center, Mamelodi

#### Description

Sponsored by the Jewish National Fund and the Gauteng Department of Environmental Education, the Walter Sisulu Environmental Centre educates approximately 10,000 learners from 186 schools in and around Mamelodi area each year (interview: de Waal, 2012). The centre is situated behind Nelson Mandela Park, on the Western banks of the Moretele Spruit in Mamelodi, and is a model of environmental best practice. The centre consists of an auditorium, administration office, computer room, water wise ablution facilities, and four environmental theme rooms focused on water, waste, biodiversity and energy. Finally, moving outside one encounters the community nursery and 'Living Classroom Garden,' a demonstration permaculture garden at its best. Features in the garden include a sensory herb spiral, vermiculture and organic composting facilities, and a 'food forest' where a thick layer of straw mulch protects the soil beneath. The garden is swale and drip irrigated from rainwater harvested off the roof of the centre, while tanks are re-filled with municipal water during dry periods. Pathways guide one through the garden as educational signposts animate and narrate the garden about the ecosystem and medicinal and nutritional values of plants. Courses in the techniques of permaculture practise are demonstrated here throughout the year.

Adjacent to the center, a large plot of land has been subdivided into allotment gardens for the nearby residents of the Mamelodi community. An initiative started by the community themselves before the opening of the centre (interview: de Waal, 2012), allotments of about 25 to 50 square metres are rented to tenants for R10-00 per month.

#### Prospects and ideas

The Living Classroom Garden is a successful South African precedent that educates youngsters and the community about the processes of nature, all the while endorsing food security. The educational centre surrounding the site also makes for a holistic environmental initiative. Aiming to educate the younger generation about the survival prospects of nurturing the environment and growing food is indeed the way forward for the future, and something that should be followed up in the design proposal for this dissertation. This too, could be in the form of an innovative demonstration garden.

The adjacent allotment gardens should be better integrated into the scheme in order to be more successful. The effective permaculture methods are not being implemented here, and tenants are predominantly of an elderly demographic. The allotment practise thus needs to be promoted as a trendy survival culture to younger struggling citizens.

## South African Precedent:

### Harare Precinct 3, Khayelitsha By Tarna Klitzner (KALA) Landscape Architects, 2009

#### Description

An entire network of playgrounds, squares and pedestrian walkways is being developed in Khayelitsha as part of the Violent Prevention through Urban Upgrading (VPUU) initiative – a partnership between the German Development Bank and the City of Cape Town.

The design reflects the safety principles of the VPUU, which promotes passive surveillance by means of community centres with a caretaker's flat on the upper floor, well-lit and paved pedestrian routes, and community activities which include play areas, sports fields and places of trade (ILASA, 2009).

The first redeveloped public space in the incrementally built network is Harare Precinct 3. This once-derelict space functions not only as a stormwater-detention pond for 1:100-year floods, but also an open-space that is criss-crossed by many people. What's more, the design provides a children's playground, a lawn 'kickabout' and simultaneously acts as a thoroughfare for passers-by. The community centre and surrounding litter bins have been decorated in mosaic by the community who were also included in the design decisions by the landscape architect.

This is a highly successful South African Precedent which has received the 2009 ILASA Award of Excellence in Design.

#### Prospects and ideas

Not only have the stormwater, recreational and pedestrian needs of the community been accommodated, but the surveillance and safety of the area have been significantly improved through the community centre and caretakers intervention. The focus area of this dissertation too, has problems involving crime and safety. This precedent may thus become a model project which demonstrates the success of mixed use 'follies' which facilitate the passive surveillance of the site.

The landscape architect also involved the community in decision-making and beautification initiatives such as mosaic artworks. This contributed in generating pride of ownership of the area. The communities of Clydesdale and Sunnyside may also be easily involved in such a scheme.



Illustration 145: Identified hotspots of the VPUU scheme in Khayelitsha (Klitzner, 2010).



Illustration 147: Play area within the safety of the community centre (Klitzner, 2010).



Illustration 148: Local woman mosaicing and beautifying her hometown (Klitzner, 2010).



Illustration 146: Mosaic-adorned community centre with caretaker's lodging on the 2nd story (Klitzner, 2010).

Illustration 149: Aerial photograph of Precinct 3 (Klitzner, 2010).



Illustration 150: It was insured that Precinct 3 was well-lit at night, especially for safety measures (Klitzner, 2010).

CASE STUDY:

The *Schrebergärten* allotment gardens of Zurich, Switzerland

Description

Family gardens or the *Schrebergärten* (allotments), of Zurich, Switzerland have been running since the Second World War and have recently been revived with great public interest. Particularly west of the historic core, it has become central to the shaping of a new, creative and ‘trendy’ identity for the orderly city. This identity is associated with the collective creativity of small groups of people situated in all kinds of informal ‘edge conditions’ in the city (Abrahamse, 2011:43). Throughout Zurich, small *Schrebergärten* plots cluster in the leftover urban land between railway lines, alongside the river and on the hillside slopes above the city. While urban planners insist that these green plots are strictly regulated, they nevertheless show a higher level of flexibility of use when compared to the rest of the city.

Averaging on about 50 to 400 square metres, some gardens are suitable for families with young children, while others are more apt for individuals. The plots generally include a shed for tools and shelter. Many of the sheds become spring and summer time lodgings for short periods. The individual gardeners are typically organized in an allotment association, which leases the land from an owner who may be a municipal, private or church body, and who usually stipulates that it be only used for gardening (i.e. growing vegetables, fruits and flowers), but not for residential purposes (this is usually also required by zoning laws). The gardeners pay a small membership fee to the association, and have to abide by the corresponding constitution and by-laws (Drescher et al, 2006). It is customary for each tenant to have their own compost heap for organic waste.

Interviews have revealed that tenants tend to their plots everyday, if only for half an hour. Other tenants see to their allotment as a weekend pastime. Tenants state that the garden areas keep them healthy and install them with a sense of pride with the rewards that come from the garden (Spindler, 2012). A new social culture has furthermore



Illustration 152: Aerial view of Zurich's Schrebergärten (From: <http://www.panoramio.com/photo/3553095>).



Illustration 153: Closer view of the allotment gardens with their ‘summer houses and/or tool sheds (From: <http://view.stern.de/original/Sommer-Garten-Schrebergarten-Schrebergarten-Schwarz-Natur-%26-Landschaft-712440.html>).

**SCHREBERGÄRTEN**  
BLICKE INS GEORDNETE GRÜN  
8. JUNI - 7. JULI 2007

**SCHREBERGÄRTEN?**  
DAS BILD DES SCHREBERGARTENS ALS KLEINBÜRGERLICHER ORT, WO EIN GLEICHFORMIGES ZUFRIEDEN HEHRSCHT UND UNNUTZEN VON GEPF ÖSSE BODEN NACHHALTIG BELASTET, HÄLT SICH NOCH IMMER NÄHRACKZIG. SCHREBERGÄRTEN? STELLT DIESSES BILD ZUM DISPOSITION UND BLEIBET GEBÄUEN IN DIE GÄRTEN.

**IN FAMILIENGÄRTEN:**  
ANGEL ZIEHENDER AN  
KINDLERN  
PÄDAGOGISCH

**MIT:**  
JENNY HALLER/  
SUSANNE KÄLLIN/  
SUSANNE KÄLLIN/  
KATHARINA SCHLIEDER/  
BENJAMIN SCHWILL/  
NADINE HUBER

**ERÖFFNUNG AM 08. JUNI AB 19.00**  
NÄHRACKZIG  
NÄHRACKZIG  
NÄHRACKZIG

**FILMPROGRAMM**  
15. JUNI - 17. JUNI  
NÄHRACKZIG  
NÄHRACKZIG

**FÖHRUNGEN**  
STADTRUNDGÄNGE

Illustration 151: Schrebergärten advertisement brochure (From: [http://www.zoonar.de/photo/schrebergarten-flyer\\_2093565.html](http://www.zoonar.de/photo/schrebergarten-flyer_2093565.html))

been generated as social activities and festivals have been prompted in allotment areas, as the community shares things from seeds to celebrations. Longstanding tenants maintain good social contact with one another, while many cultures within the scheme are mixed. In an interview, a tenant enthuses, 'we have good relationships with each other, exchange tips, and my Italian neighbours to the right often give me arugula and tomatoes' (Spindler, 2012).

The allotment culture has expanded in recent years as a result of the increasing population, the resultant decreasing open space in the city, rising food prices and related fuel expenditures. There are hundreds of eager citizens that have signed up on waiting lists for the emerging *Schrebergärten* programme. The extensive communal space boasts colourful, diverse and productive gardens which endow them a unique sense of place and peace away from the city bustle. Allotment gardens have thus installed a new *zeitgeist* in the 21st century city.

Abrahamse (2011:43) states that when informality is embedded in the city, it allows those mono-functional spaces of the overly planned, 20th century city to offer a more mixed-use, fine-grained and dense urban environment. It thus creates a more agile and flexible layer of urbanism within the city. The livability of Zurich therefore cannot only be attributed to its orderliness and high levels of control. It is also the less formal use of space that gives citizens the ability to adapt to changing needs and situations, to create opportunities for cultural innovation, to allow citizens to rub shoulders in a meaningful way with one another, and to bring a human scale and complexity to the otherwise highly zoned and mono-functional districts of the city. The challenge, therefore, to Zurich's planners is somehow to keep spaces for informality open within the tight zoning schemes and regulations that overlay the city (Abrahamse, 2011:45).

### Prospects and ideas

The allotment scheme is a highly relevant and meaningful city intervention. Because it has continued since the Second World War, and has recently been revived as a trendy pastime in Switzerland (including other developed countries, such as Britain, Czechoslovakia, Denmark, Finland, Norway, France, Portugal and Germany), its relevance to the environmental and economic dilemmas of the 21st century need to be embraced all the more. There is thus an inherently valuable opportunity to formally initiate the scheme in our developing country, South Africa- especially within the urban environment where space is limited. The *Schrebergärten* have demonstrated how undeveloped or underutilized land can be reclaimed through the anarchy of a resilient community. Allotment gardens prove how the landscape can become self-sustaining and how citizens can become self-sufficient, all the while a sense of pride and the associated social capital is built upon and reinforced. This is one of the main goals which this dissertation seeks to achieve.

As the focus area of this study lies between the suburbs of Clydesdale and Sunnyside, which already possess strong community ties, the opportunity for the allotment scheme becomes more realistic. It is through these determined communities that the programme may become possible. This can be further encouraged through non-governmental organisations, such as *Afristar* and the *Siyakhana Initiative*. Furthermore, the multi-cultural dynamics of the two suburbs may be enhanced and integrated through a programme such as the *Schrebergärten*. Additionally, it has been proven in *Chapter 3, 'Context,'* that the community of Sunnyside East consists of a sector of community members which need a source supplementary income. It has been found that both of the community associations of Clydesdale and Sunnyside are passionate about the greening of the Walkerspruit. Alas, nothing in the area has happened to date as municipal funds are depleted.

This case study has proven that when passionate community groups become actively involved, the dependence on hampered municipal authorities is decreased and greening initiatives actually begin to happen. A dynamic, multifunctional, personal and vernacular landscape is born that is maintained by the spirit of city citizens which bring about a sense of place through pride and governed ownership. Sassen (2007:43) adds that the allotment movement offers a range of economic, artistic and professional opportunities to citizens and allows for greater levels of creativity, experimentation and entrepreneurship. The catalytic masterplan of this dissertation will hence be inspired by the allotment scheme, and, although hypothetical, it may become a vision to inspire the communities themselves. The *Schrebergärten* of Zurich are perhaps the most visible examples of spaces in which the individual citizens are enabled to control and adapt pieces of the city.

The Office International du Coin de Terre et des Jardins Familiaux (n.d), a Luxembourg-based organization representing three million European allotment gardeners since 1926, describes the socio-cultural and economic functions of allotment gardens as follows:

- for the community a better quality of urban life through the reduction of noise, the binding of dust, the establishment of open green spaces in densely populated areas;
- for the environment the conservation of biotopes and the creation of linked biotopes;
- for families a meaningful leisure activity and the personal experience of sowing, growing, cultivating and harvesting healthy vegetables amidst high-rise buildings and the concrete jungle;
- for children and adolescents a place to play, communicate and to discover nature and its wonders;
- for working people relaxation from the stress of work;
- for the unemployed the feeling of being useful and not excluded as well as a supply of fresh vegetables at minimum cost;
- for immigrant families a possibility of communication and better integration in their host country;
- for disabled persons a place enabling them to participate in social life, to establish contacts and overcome loneliness;
- for senior citizens a place of communication with persons having the same interests as well as an opportunity of self-fulfillment during the period of retirement

## **SYNTHESIS OF INVESTIGATION:**

1. Reclaiming and interconnecting the city's existing open space is a sustainable approach for rejuvenation, highly relevant for a city such as Tshwane, where budgets are limited.
2. Activists of the Guerilla gardening campaign have proven that greening the city need not be an extensive, high cost endeavour. Through small scale intercessions, the lost spaces of the city may be recovered through the power and the social capital of the community themselves.
3. The precedent studies have proven that there is a heightening awareness of human and ecological health in relation to the designed landscape.
4. Educating the community about the processes of nature, while endorsing food security makes for a holistic environmental initiative.
5. Surveillance and safety of the area may be significantly improved through the implementation of mixed use follies, including a community centre and caretakers intervention.
6. Allotment gardens prove how the landscape can become self-sustaining and how citizens can become self-sufficient, all the while a sense of pride and the associated social capital is built upon and reinforced.

*In order to do something big- to think globally and act globally- one starts with something small and one starts where it counts. Practice, then, is about making the ordinary special and the special more widely accessible- expanding the boundaries of understanding and possibility with vision and common sense*

*(Hamdi, 2004:xix)*



# URBAN FRAMEWORK

## URBAN FRAMEWORK

### INTRODUCTION:

This chapter seeks to provide an over-arching framework for the purposes of the design intervention of this dissertation. As the focus area lies along the Walker Spruit between the suburbs of Sunnyside East and Clydesdale (see *Chapter 3: 'Context,' and Chapter 4, 'Site Analysis'*), a group framework has been devised in conjunction with three other Masters (landscape, interior and architectural) students from the University of Pretoria, who are working on sites nearby. The resultant 'catalytic' framework is theoretical and has been situated within the shared suburb of Sunnyside as a precinct area, which may extend further through and out of the city.

The group framework has been further extended by the author, as a Continuous Productive Urban Landscape (CPUL) (see *Chapter 2, 'Theory'*) has been devised for the city of Tshwane. This becomes a broad-scale vision which grows out of the small-scale catalytic interventions of the group framework.

### GROUP FRAMEWORK

#### URBAN ACUPUNCTURE: A POINT OF DEPARTURE

An urban environmentalism theory, urban acupuncture is urban design inspired by the traditional Chinese medical theory of acupuncture<sup>2</sup>. This strategy therefore views cities as living, breathing organisms and pinpoints areas in need of repair and renewal (McCartney, 2011). Urban acupuncture thus focuses on the selective reclamation of appropriate sites within the historic fabric of the city. It thus brings life to what already exists by inserting contemporary, appropriate interventions which serve as needles that revitalize the whole by healing the parts.

Devised by Finnish architect and social theorist Marco Casagrande, this school of thought avoids conventional, large-scale urban renewal projects, and turns to that of a more localized approach involving the community. Casagrande views cities as complex energy organisms in which different overlapping layers of energy flows are determining the actions of the citizens as well as the development of the city (Casagrande Laboratory, 2011). In summary, urban acupuncture means focusing on small, subtle, bottom-up interventions that harness and direct community energy in positive ways towards urban regeneration. The theory therefore opens the door for unrestrained freedom as each citizen is enabled to join in the creative process, and develop his environment ac-

2. According to the Oxford Dictionary (2012), acupuncture is a system of complementary medicine that involves pricking the skin tissue with needles, used to alleviate pain and to treat various physical, mental and emotional conditions.

ording to his will. The over-arching vision is the post-industrial city or, according to Casagrande, the '3rd Generation City.'

Urban acupuncture hence involves the reclamation of lost space in the city, emphasizing the importance of community development through small scale interventions. This sensitive yet contemporary approach is highly applicable in an era of constrained budgets, limited resources, and urban sprawl. The suburb of Sunnyside within the city of Tshwane will thus become a pilot project for the application of this approach. Opposing mega-interventions that typically require heavy investments of municipal funds, the theory of urban acupuncture could democratically and cheaply offer relief to Tshwane urban dwellers as well as the authorities.



Illustration 155: Taipei Organic Acupuncture by Marco Casagrande (From: <http://helsinkiacupuncture.blogspot.com/>)

### Goals and objectives of the framework

*Illustration 160* shows a diagrammatic summary of the intentions of the framework. In examining the existing city stock, the 'lost spaces' of Sunnyside have been identified and highlighted. These lost spaces have been classified as abandoned or underutilized public space and public amenities, which have been largely forgotten and/or under-maintained by the municipality. It has thus been proposed that though the notion of Urban Acupuncture, these spaces can become the medium for the rejuvenation of the suburb. This would be done through flexible possibilities of either restoration, demolition or re-use, depending on whichever best suits the local conditions of each site.

The lost spaces of Sunnyside are thus viewed as the 'sleeping areas' of the suburb which hold latent potential and opportunity for its rejuvenation. Developing these areas would combat the lack of public space, the neglect and the associated energy depletion of these sites.

**In order for this catalytic activation of Urban Acupuncture to occur, it is believed that three realms need to exist for this to take place successfully:**

#### 1. Mobility and Connectivity

Through the identification of the gaps in the urban fabric and identifying the overall patterns of the development opportunities, a network of potential may be derived. This is the potential for reviving the city through reclaiming what already exists.



## 2. Sociodiversity

A sustainable and holistic view of open space should include qualitative and longer-lasting criteria which the public can relate to. Programmes which involve health, education, recreation and interaction are important as they take the broader community into consideration. Local knowledge should also be incorporated as the neighbourhood's social status is recognised. Open spaces evolved this way will develop strong local interactions and provide opportunities for social contact while a sense of community is created.

## 3. Sustainability

This programme provides for the repairing of the varied broken and forgotten parts of the city through community collaboration. Community participation and involvement promotes pride of ownership, making this concept relevant as it will be self-sustaining. Furthermore, 'rather than trying to manufacture a completely new urban machine,' (Casagrande Laboratory, 2011) this concept, though reclamation, will sustainably repair what already exists, while respecting the historical layer of Sunnyside.

## Mapping Sunnyside

The following pages (illustrations 161-168) show how the suburb of Sunnyside has been mapped according to its lost space, public space, sports grounds, existing frameworks (ie. The Mandela Corridor) and activities (ie. religious institutions, sports institutions, medical amenities, shopping centres, sports grounds and museums).

The location of the group's strategically-placed catalytic interventions have then been added to the scheme as a final concluding layer.

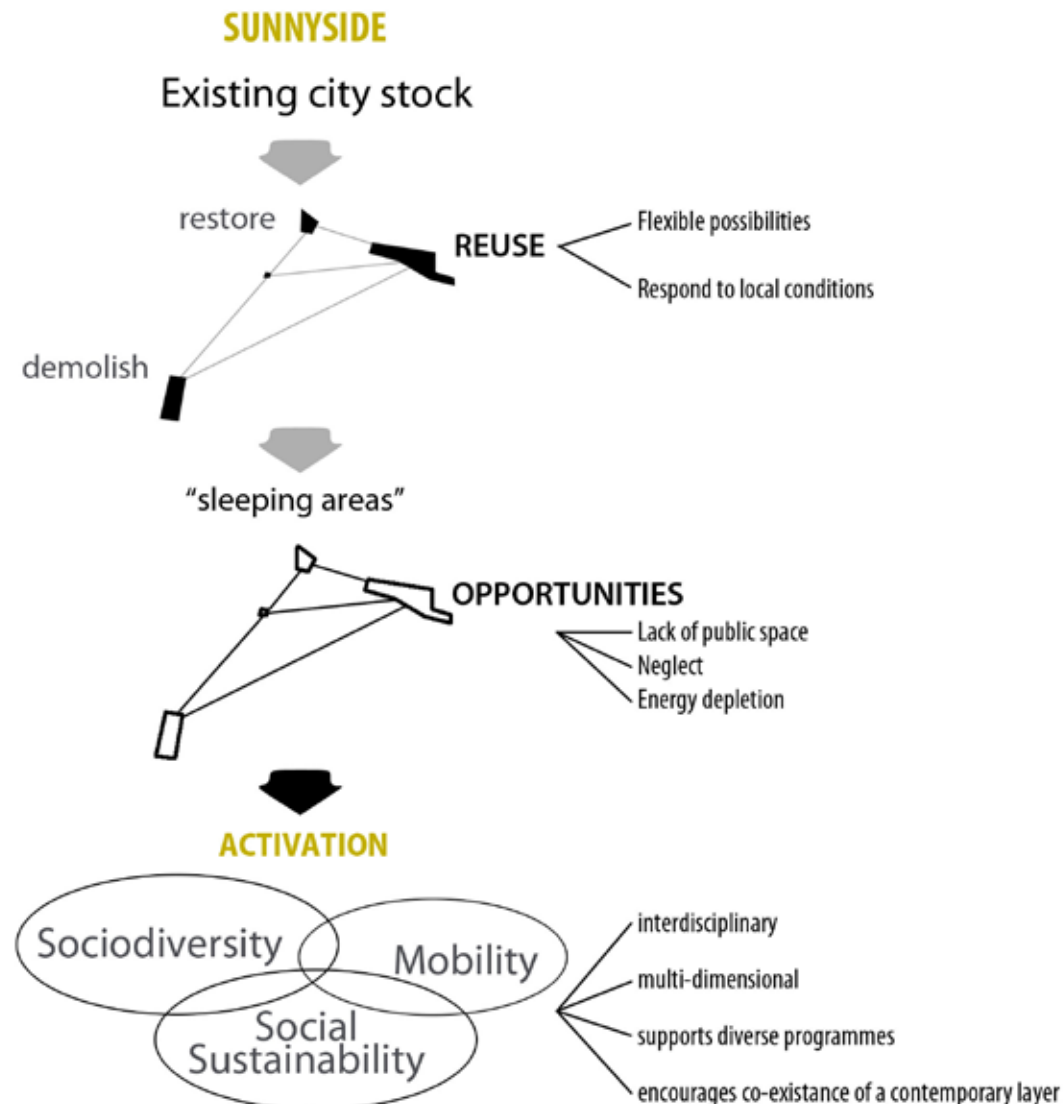


Illustration 156: Diagrammatic summary of the approach (Group Framework, 2012)

CHAPTER 6: FRAMEWORK

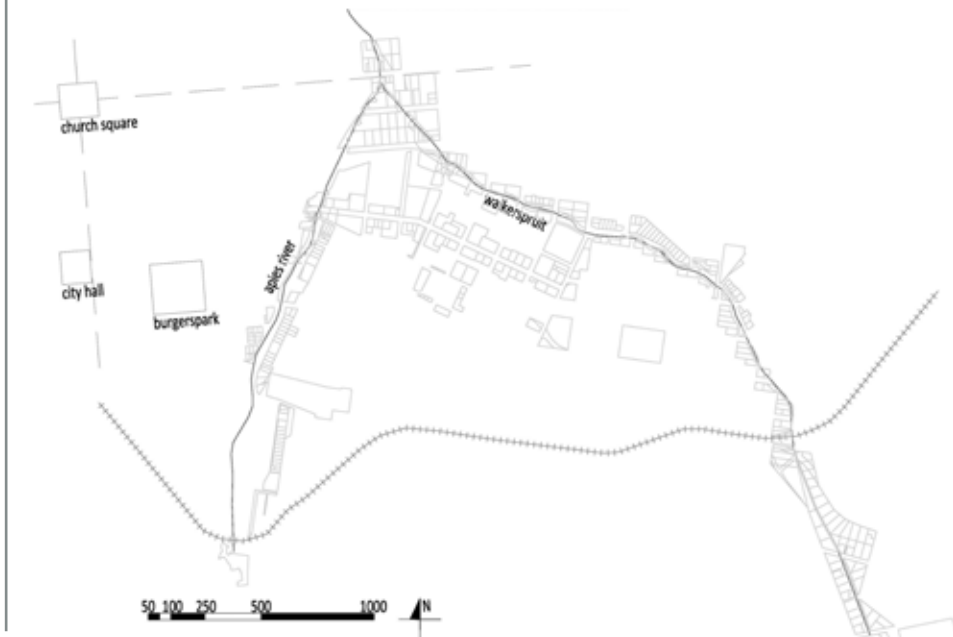


Illustration 157: Sunnyside context within its natural boundaries of the Apies River & Walker Spruit, with the southerly railway line and the city centre to the North West (Group Framework, 2012)



Illustration 158: Sunnyside's public open space (Group Framework, 2012)

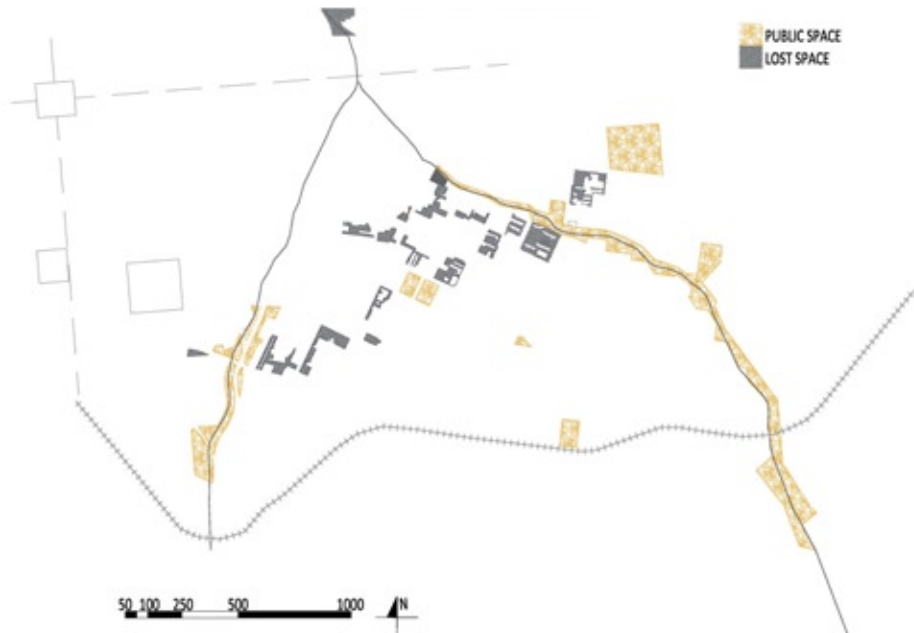


Illustration 159: Added layer of lost, utilized space seen as gaps within the urban fabric (Group Framework, 2012)



Illustration 160: Added layer of sports ground public open space showing the optimal potential of interconnected open space in the region (Group Framework, 2012)



Illustration 161: Added layer of the approved Mandela Corridor Development Framework- lost space that will be utilized by council (Group Framework, 2012)



Illustration 162: Added layer of the existing activities of the suburb; (ie. religious institutions, sports institutions, medical amenities, shopping centres, sports grounds and museums) indicated what is needed and what can be improved (Group Framework, 2012)

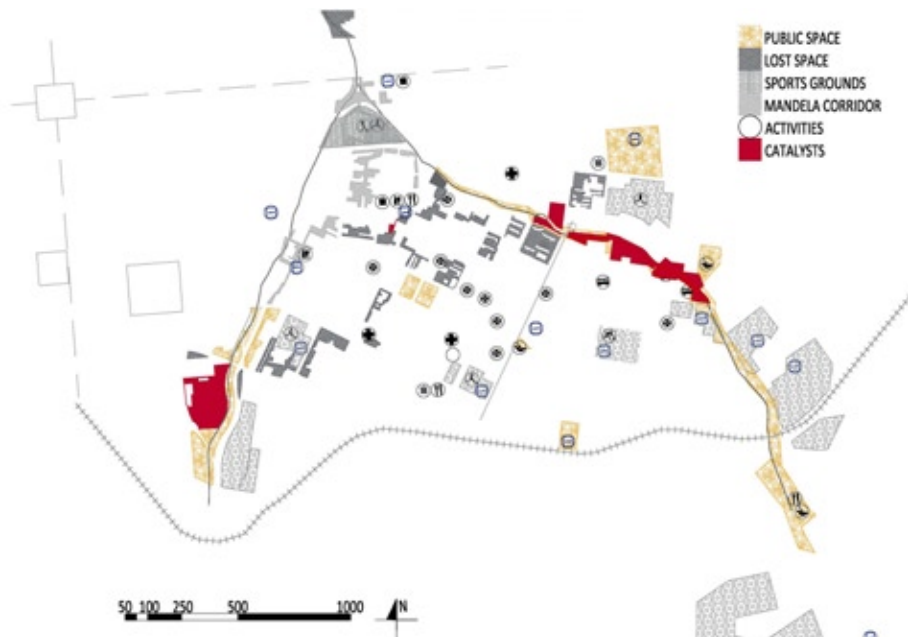


Illustration 163: Strategically-placed catalytic interventions (Group Framework, 2012)

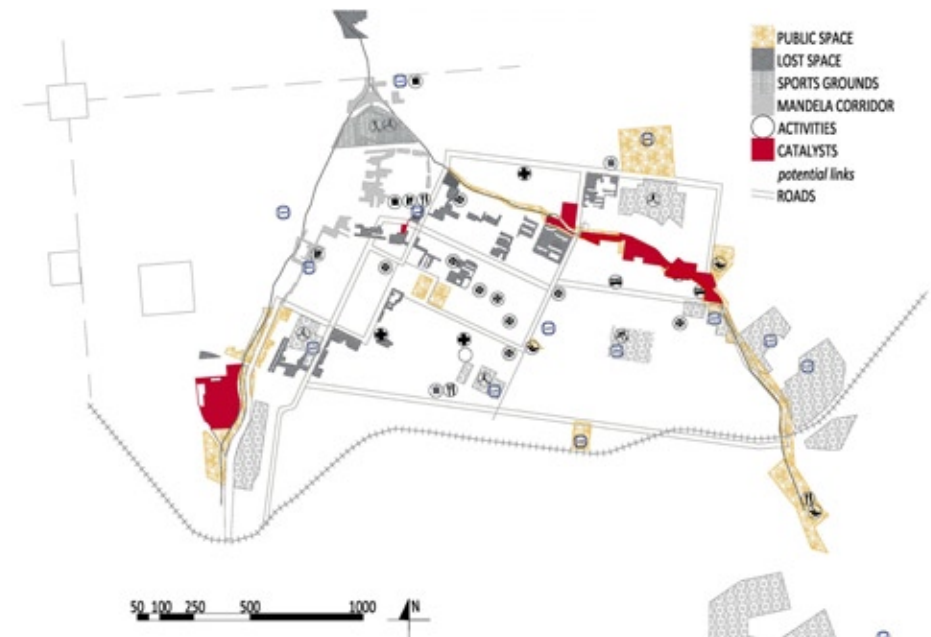


Illustration 164: Potential linkages through the existing road network (Group Framework, 2012)



Illustration 165: Potential network of linkages through existing and available intermediary space (Group Framework, 2012)

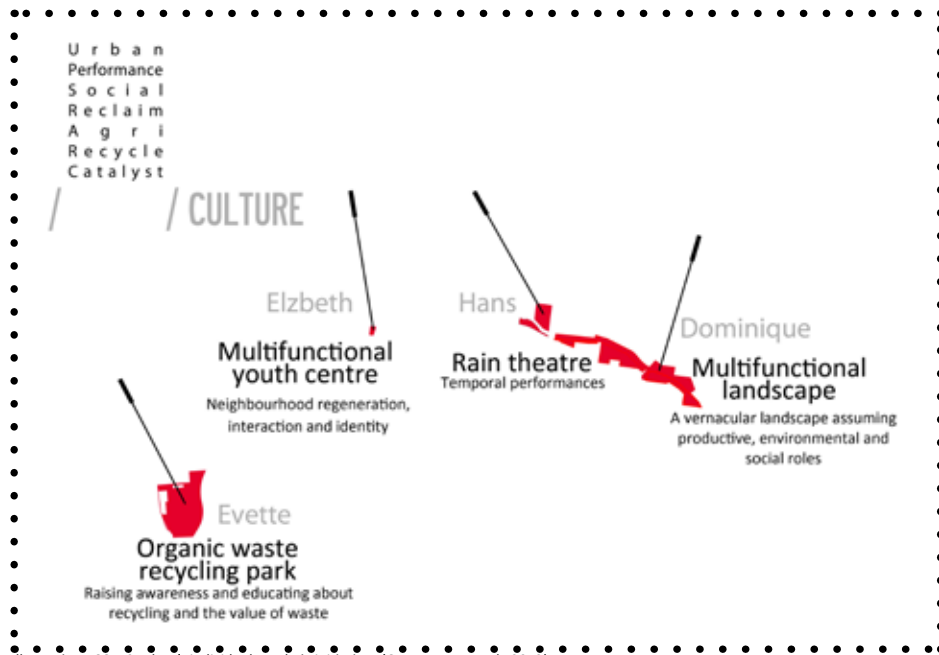


Illustration 166: Student's individual catalytic initiatives (Group Framework, 2012)

### Concept: 'Catalyst Culture'

A summary of the framework concept has been demonstrated in *illustration 171* as a parti diagram. This is further elaborated below:

Through strategically and responsively-placed catalytic interventions, the notion of Urban Accupuncture may begin to take place within the suburb of Sunnyside. These interventions aim to involve the community to sustainably improve their environment and way of life. These initiatives involve the individual initiatives of the students, as referred to in *illustration 170*. Landscape architect Evette Kotze is designing for an organic waste recycling park, interior architect Elzbeth Petzsch is transforming an underutilized building into a multifunctional youth centre, architect Hans Viljoen is designing a recreational amphitheatre that raises water awareness, while the author, Dominique Rossi is designing a multifunctional, productive landscape to improve the sustainability and food security of the area.

It is believed that through assuring the connectivity and mobility between these interventions and their existing surrounding public open space, a network of sustainable social space will be provided, which is much needed in the area.

What is more, these catalysts will educate and inspire the Sunnyside community, as they possess potential to emerge and grow, with time, into the identified lost spaces and gaps within the urban fabric. These intermediary spaces and roads provide additional potential linkages, expanding the network (see *illustration 172*). This will eventually become a multi-functional network brought about by the initial catalytic interventions within the suburb (see *illustration 173*), which will in turn become self-sustaining as the original mediating, umpiring catalysts fall away (refer to *illustration 174*).

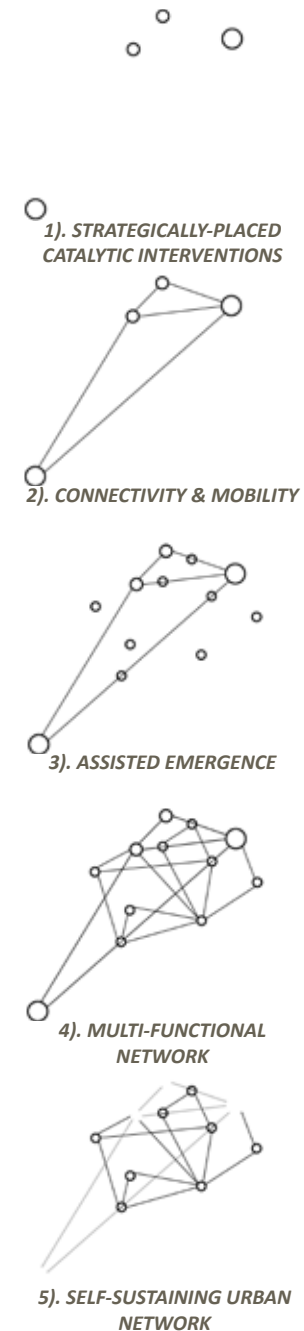


Illustration 167: Parti Diagram of framework concept (Group Framework, 2012)

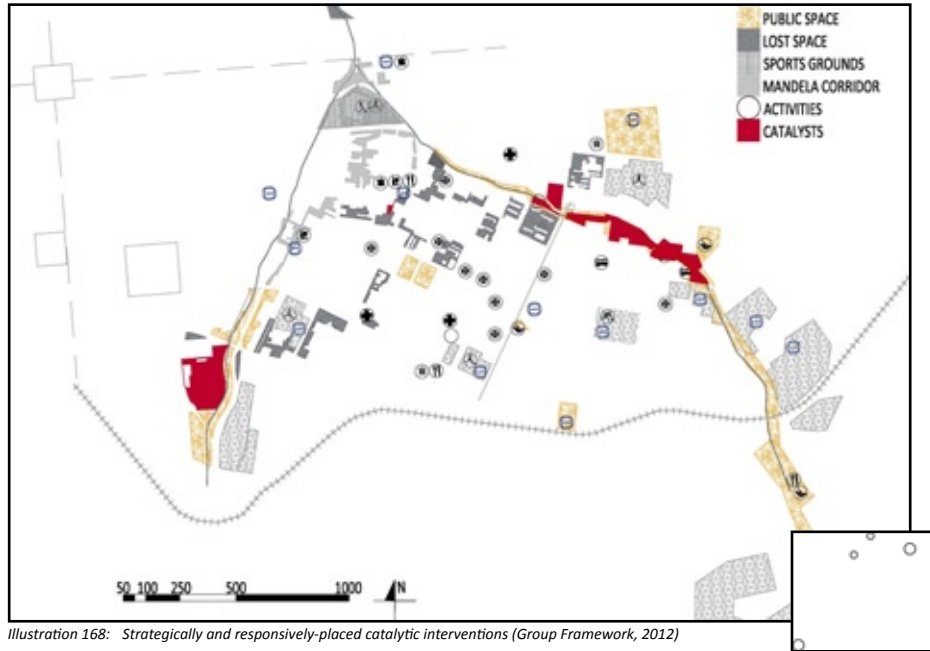


Illustration 168: Strategically and responsively-placed catalytic interventions (Group Framework, 2012)

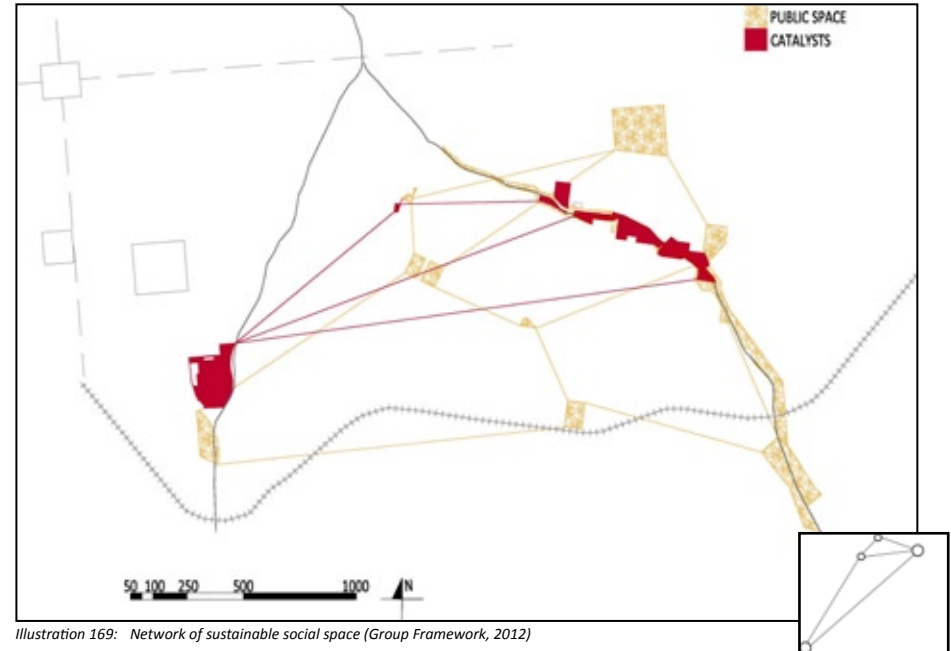


Illustration 169: Network of sustainable social space (Group Framework, 2012)

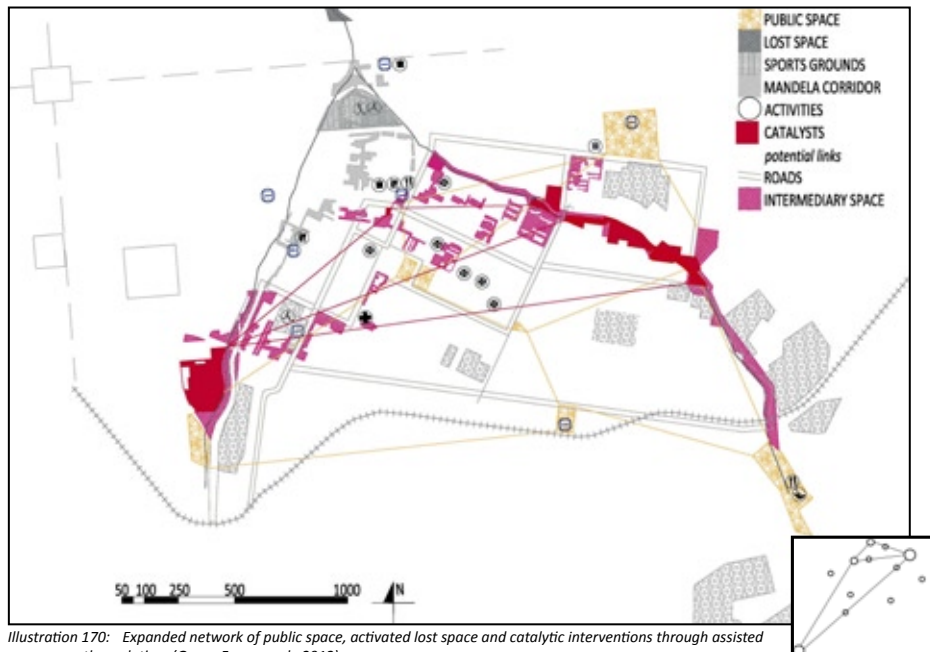


Illustration 170: Expanded network of public space, activated lost space and catalytic interventions through assisted emergence through time (Group Framework, 2012)

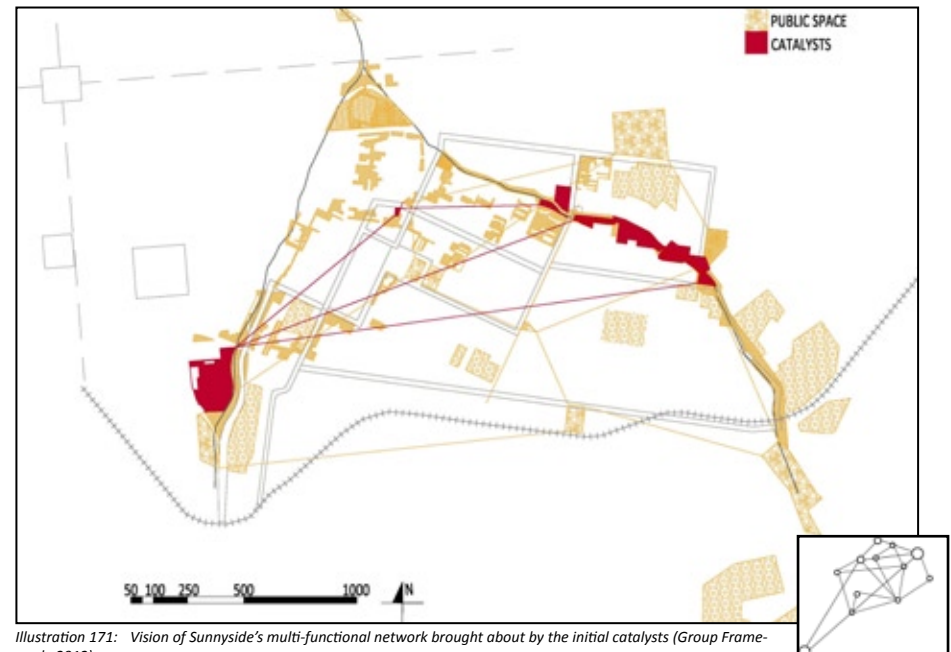


Illustration 171: Vision of Sunnyside's multi-functional network brought about by the initial catalysts (Group Framework, 2012)

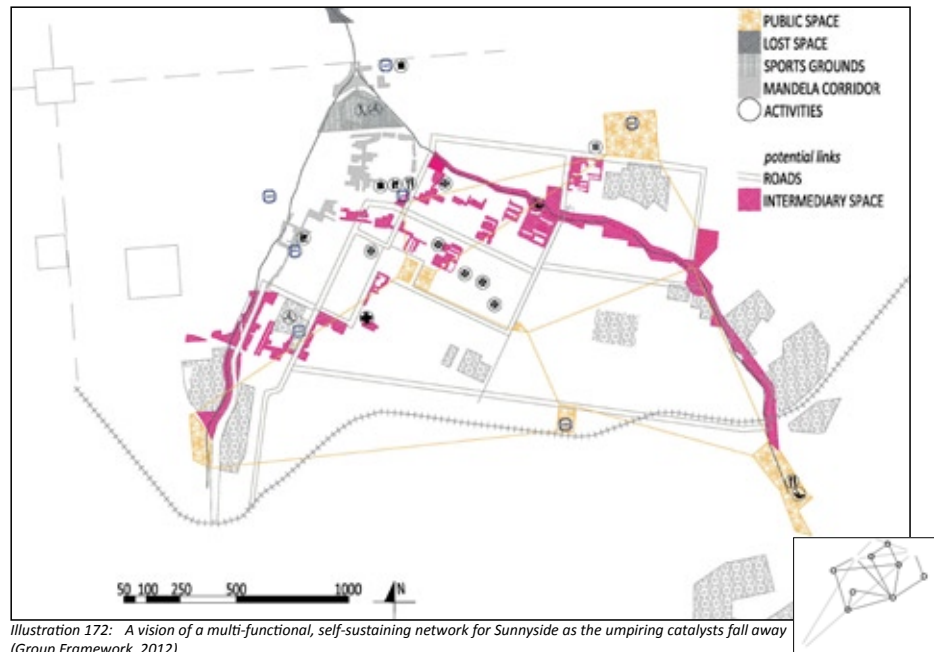


Illustration 172: A vision of a multi-functional, self-sustaining network for Sunnyside as the umpiring catalysts fall away (Group Framework, 2012)

This conceptual, flexible framework thus provides for the autonomy and emergence of community initiatives, brought about by mediating and strategic catalytic interventions. This scheme is hence in strong support of the teachings of Dewar and Uytendboogaart, as quoted in conclusion below:

*A hallmark of positive urban environments is that they contain qualities of secrecy and complexity. These qualities cannot be entirely achieved through design: they result from the energy and ingenuity of the people living within them being applied to meeting their own particular needs and requirements. It is an essential function of a plan, therefore, to create pre-conditions for this complexity to emerge, by creating opportunities for freedom of action. There is thus always a judgement as to how far design should go (Dewar & Uytendboogaart, 1995:11).*

### Sunnyside as a Catalytic Precinct

The theory of Urban Acupuncture has been applied to the suburb of Sunnyside as a precinct area. In considering the Author's individual intervention of the productive, multifunctional landscape initiative, it has been found that this has further potential of expanding along the Walker Spruit as demonstrated in *illustration 171*. Through the revampment of the Kerneels Young Hiking Trail (as discussed in *Chapter 2: 'Theory,'*

*Chapter 3: 'Context,' and Chapter 4: 'Site Analysis'),* the precinct may be extended to include the suburbs of Clydesdale, Muckleneuk, the Central Business District and the botanical area along the Pretoria Zoo, further towards the North. This will connect multiple educational facilities (ie. the University of Pretoria, Unisa Campus, Pretoria Boy's High, Pretoria Girls High, Meisies Hoër, Seun's Hoër, Pretoria Technical High and the TUT Arts Campus), as well as many renowned landmarks of Pretoria (ie. the Austin Robert's Bird Sanctuary, Nieuw Muckleneuk Trim Park, Magnolia Dell, Loftus Versfeld Sports Stadium, Pretoria Art Museum, the DTI Campus, the Caledonian Sports Grounds, the Union Buildings and the Pretoria Zoological Gardens).

The rejuvenation of Sunnyside as an initial precinct will therefore transform it into a valuable connecting node of existing institutions. This will upgrade the area substantially, as well as increase property values. Using the existing Kerneels Young Hiking Trail urban trail as a connecting, stitching component of the precincts as they grow and expand will connect the various communities involved along the continuous landscape. This also possesses the potential of becoming a valuable urban trail for the tourist industry of the city.

### VISION: A Continuous Productive Urban Landscape (CPUL) for the City of Tshwane

As the revamped urban trail of Kerneels Young connects fragmented lost space along the Walker Spruit, a network of spatially continuous open land results. The resultant linear park, which is proposed to become environmentally, economically and food-productive is also a walking landscape which possesses the potential to expand further through the city, at the confluence of the Walker Spruit with the Apies River. A Continuous Productive Urban Landscape (see *Chapter 2: 'Theory'*) can thus evolve, extending through the city and into the countryside, making way for an ecological corridor along the neglected riverine areas of the city. This will ensure the continuity of ecological processes, while the connectivity between habitats will improve the biodiversity of the city. Furthermore, this Green Infrastructure, as described in *Chapter 2: 'Theory'* allows for city dwellers to escape into the countryside and country dwellers to escape into the city (Bohn & Viljoen, 2005).

An aerial photograph has thus been explored, in identifying open space suitable for a broad scale CPUL intervention in Tshwane. The author has found that the development along the river ways or 'blue ways' (TSOF, 2006:54) of the city to be one of the most viable options. River way open space development in this particular context has the maximum potential to connect an extensively lengthy network of open space all the way through to the countryside, as it 'plugs' into the many existing and approved frameworks for the city along the Apies River.

The resultant CPUL in *illustration 178* therefore extends towards the conservation areas of the Onderstepoort Nature Reserve in the North, and the Rietvlei Nature Reserve towards the South. The author acknowledges that this has further potential to connect open space along railways and unused road reserves, however, the possibility of ridges or 'greenways' (TSOF: 2005:45) as part of the CPUL has been avoided, as they will remain to be respected as conservation areas alone as they are not suited for the implementation of urban agriculture. This concept of interconnected, productive landscapes in the city fabric provides incredible potential for revitalizing the city and beyond.



Illustration 173: Sunnyside as a catalytic precinct for further expansion (Author, 2012)

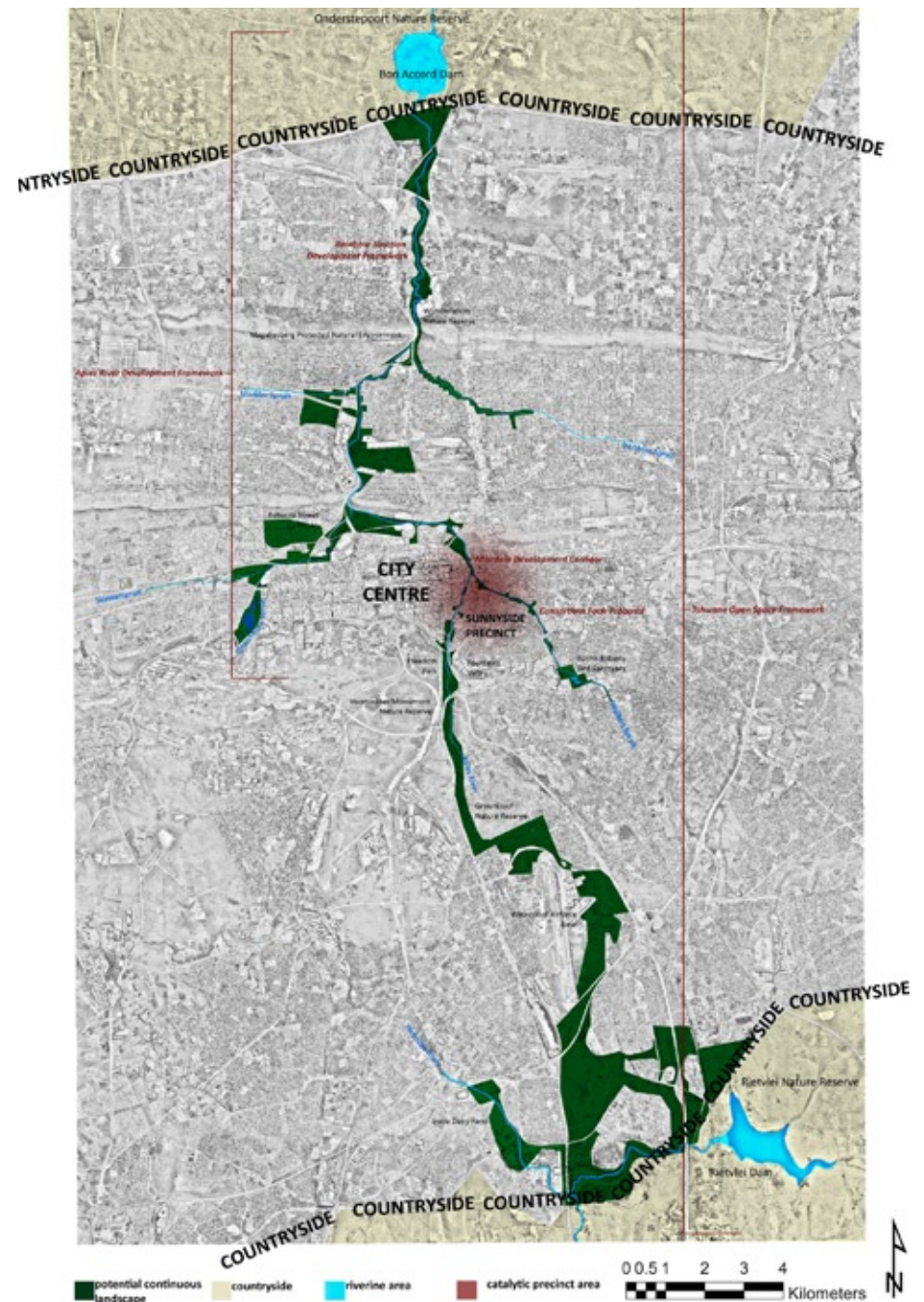


Illustration 174: A Continuous Productive Urban Landscape for the city of Tshwane, extending into the countryside (Author, 2012)

## CONCLUSION

The degenerated, neglected 'sleeping areas' of the city are misinterpreted as problems. This framework, inspired by architect Marco Casagrande's notion of Urban Acupuncture, proposes that lost space should be seen as assets which perforate the city, whilst they provide the medium in which rejuvenation may begin.

The main characteristics and goals of the programme are summarized as follows:

- Emergent
- Flexible
- Acts as a catalyst for change
- A process, not a product
- Facilitates access to the hidden resources ('lost space') of the city
- A multi-functional landscape
- Promoting a new urban ecology
- Self-sustaining through community pride of ownership

This theoretical, conceptual framework of strategically-located catalytic interventions has been applied to the urban suburb of Sunnyside as a precinct, which may spread through and further out of the city.

In terms of the author's catalyst proposal of a multi-functional landscape pilot project, the approach of Urban Acupuncture may be extended into the broad-scale vision of a Continuous Productive Urban Landscape (CPUL) for the future ecological rejuvenation of the city.

*"It is about growing the whole incrementally, small change with a big vision maybe, but not the kind of single vision that dominates local aspiration"*  
(Hamdi, 2010:43).



*'...and here's a marvellous convenient place for our rehearsal. This green plot shall be our stage, this hawthorn brake our tiring-house, and we will do it in action...'*

*~A Midsummer Night's Dream, (Quince) William Shakespeare.*



# DESIGN DEVELOPMENT

## DESIGN DEVELOPMENT

### INTRODUCTION

This chapter will proceed to illustrate the iterative process which was undertaken to explore and resolve the design problems. This chapter displays the alternatives and methods explored as the design solutions evolved and developed. Please note that the final decisions are discussed in the following *Chapter 8: 'Detail Design.'* The overarching concept for the scheme as a design-driver is explained below.

### THE CONCEPT

The overall concept has been based on two existing and established theories, which have been synthesized and combined into the author's individual concept for the specific scheme of a continuous, productive and multi-functional landscape.

Architect Tschumi's three principles of Line, Grid and Point for the design of Parc de la Villette in Paris have thus been used in conjunction with John Dixon Hunt's descriptions of First, Second and Third Nature, after Roman writer Cicero. In combining these two

theories, the concept for this dissertation evolved.

### Tschumi's Three Principles of Line, Grid and Point for the Design of Parc de la Villette, Paris

According to Wall (1983:29), the project illustrates maximum programmatic flexibility and invention through the superimposition of three separate structures- a line system, a grid system and a surface. The park was hence arranged according to the following principles:

- **Line:** routes used to mark high density movement and axes which simultaneously link various parts of the park.
- **Grid (also 'Point'):** A regular grid with points of intensity ('follies') that anchor points of possible future constructions. The neutral space created in between the points of intensity can be transformed and elaborated as required (Tschumi, 1994:57).
- **Surface:** Large surfaces are deliberately left open creating expanses of horizontal space for playing games, body exercise, mass entertainment or markets.

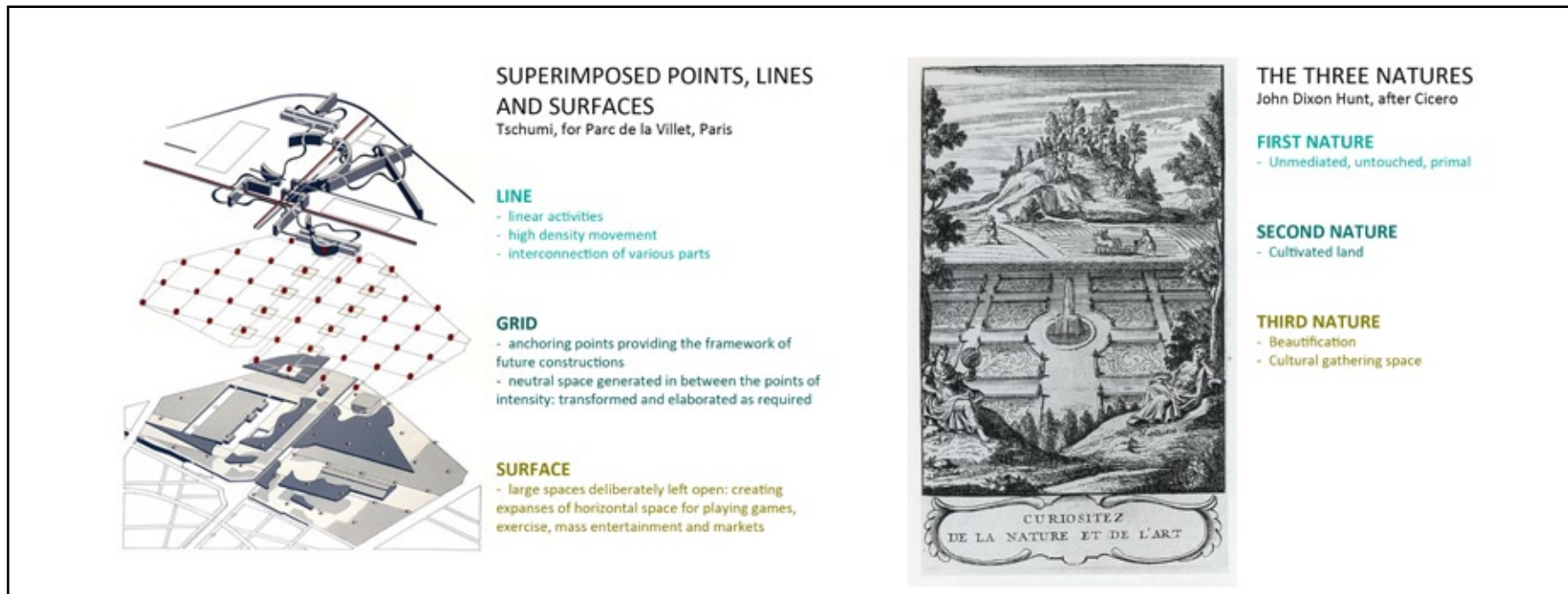


Illustration 176: Tschumi's concept of lines, grids and surfaces (From: <http://www.imageandnarrative.be/inarchive/uncanny/bartvanderstraeten.htm>), alongside Cicero's Three Natures (From: <http://some-landscapes.blogspot.com/2009/06/third-nature.html>) (Author, 2012)

## The Three Natures, John Dixon Hunt, after Cicero

In *De natura deorum* Cicero wrote “We sow corn, we plant trees, we fertilize the soil by irrigation, we dam the rivers and direct them where we want. In short, by means of our hands we try to create as it were a second nature within the natural world.” Hence, ‘First nature’ - wilderness - is the realm of the gods, but it is also the raw material for second nature. John Dixon Hunt later found that Bonfadio wrote in 1541 that gardens make up the ‘third nature.’ (Plinius, 2009).

The 1705 frontispiece to l’Abbé de Vallemont’s *Curiositez de la nature et de l’art* (illustration) shows a distant mountain (‘first nature’) giving way to cultivated agricultural land (‘second nature’) and then a formal garden (‘third nature’).

## The Synthesis

Through the synthesis and juxtaposition of the two preceding theories, the concept for the means of this dissertation was derived as is fully explained below:

- **LINES AS FIRST NATURE:**

High density routes of pedestrian and cyclist movement will stitch the fragmented landscape together alongside the ecologically-restored Walker Spruit. Endemic species will be re-established along this area as an ecological corridor is catalyzed and re-generated.

- **GRID AS SECOND NATURE:**

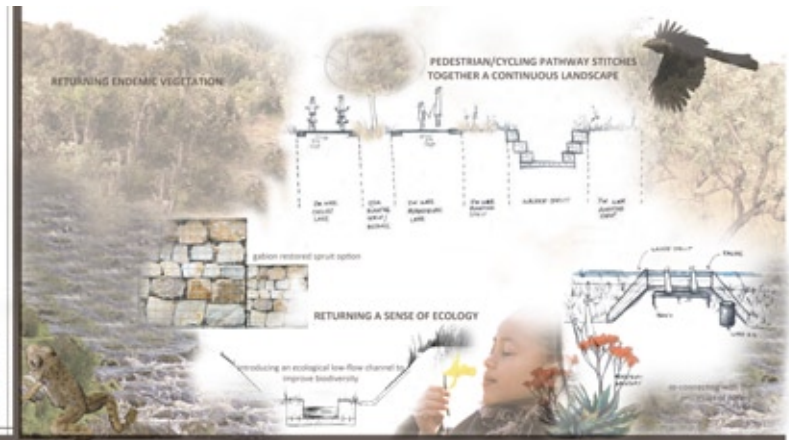
A flexible, enabling framework for allotment gardens will be established which can be transformed and developed as desired by the tenants. This allows for agriculture as a tribute to the heritage of the focus area to be built upon. ‘Follies’ such as caretaker’s residences, and other amenities such as kiosks, restaurants, canteens will support the use and activity of the area as well as aid in its passive surveillance.

- **SURFACE AS THIRD NATURE:**

Expanses of both hard and soft horizontal space will be deliberately left open for social gathering events such as markets and recreational events. These spaces will be defined by elements promoting the beautification of the area as community participants will be involved in activities such as mosaic work and the carpentry of play equipment. Defining a ‘sense of place,’ lingering spaces will also be generated along the busy pedestrian corridor.

### LINES AS FIRST NATURE

- RETURNING A SENSE OF ECOLOGY TO THE WALKER SPRUIT
- THE CONTINUOUS LANDSCAPE LINKED BY MEANS OF A PATHWAY
- ECOLOGICAL CORRIDOR
- ENDEMIC PLANTING PALLETTE



### GRID AS SECOND NATURE

- FLEXIBLE, ENABLING ALLOTMENT FRAMEWORK
- POINTS OF INTENSITY AS CATALYTIC COMMUNITY SPACE



### SURFACE AS THIRD NATURE

- BEAUTIFICATION OF OPEN SPACE BY THE COMMUNITY
- DEFINING 'SENSE OF PLACE'
- SOCIAL GATHERING/LINGERING SPACE

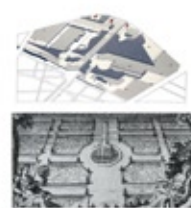


Illustration 177: Final, over-arching concept for the scheme (Author, 2012)

**CHAPTER 7: DESIGN DEVELOPMENT**

**MASTERPLAN DEVELOPMENT**

The main design objectives of the masterplan was the integration and multifunctionality of the open space.

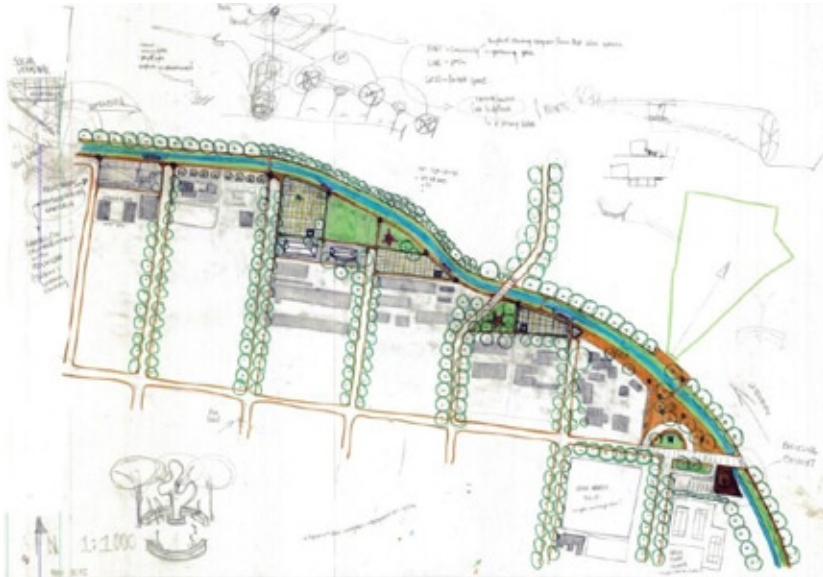


Illustration 178: Masterplan attempt #1: General zoning, interconnection and space-making decisions (Author, 2012)



Illustration 179: Masterplan attempt #2: Defining space, consolidating allotment plots and allocating follies along the route: a nursery, restaurant, caretaker's residence, public ablutions, a kiosk, and a canteen (Author, 2012)



Illustration 180: Masterplan attempt #3: Defining space further, investigation of de-channelizing the spruit, and considering the alignment, management, irrigation and upkeep of the allotment plots (Author, 2012)



Illustration 181: Masterplan attempt #4: Integrating and defining the overall masterplan zoning concept: a cyclical storyline of the sustainable living process (Author, 2012)

### DEALING WITH THE WALKER SPROUT

The design objective of returning ecological functions to the Walker Spruit was brainstormed as various methods were explored

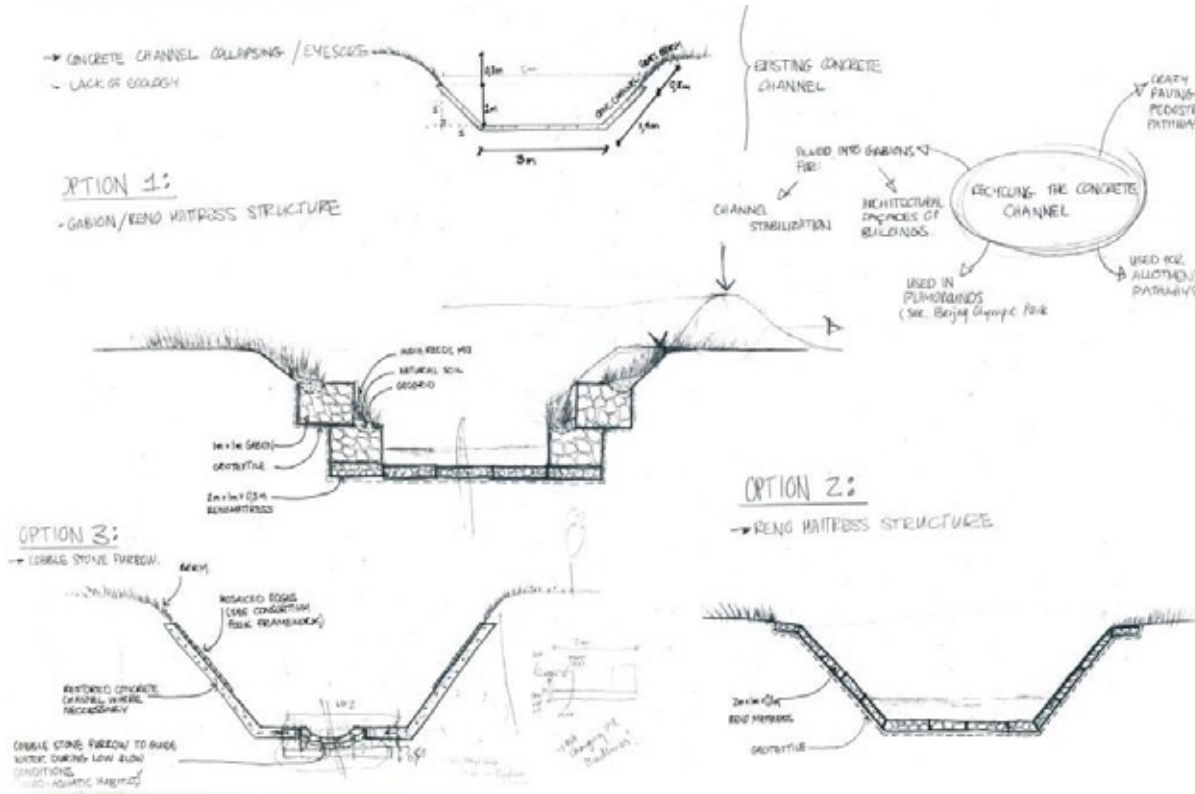


Illustration 182: Exploration of various biological means of returning a sense of ecology to the Walker Spruit (Author, 2012).

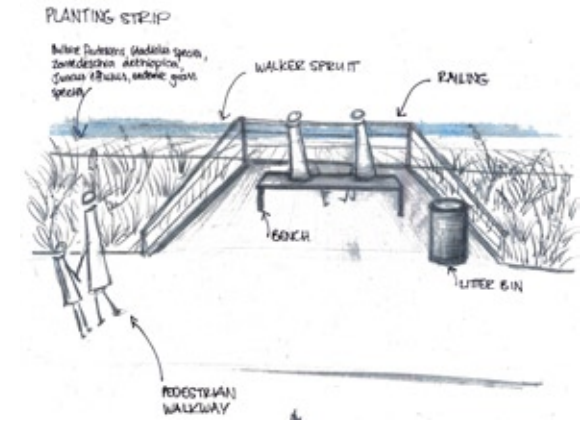


Illustration 184: Conceptual sketch of the seated lingering spaces & look-out points between a 2.5m-wide vegetated buffer strip along the Spruit (Author, 2012).

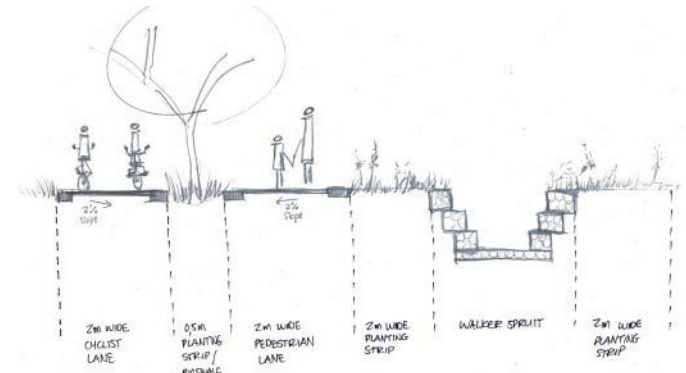


Illustration 185: Conceptual section of the pedestrian and cyclist pathways, separated by a vegetated bioswale alongside the Walker Spruit (Author, 2012).

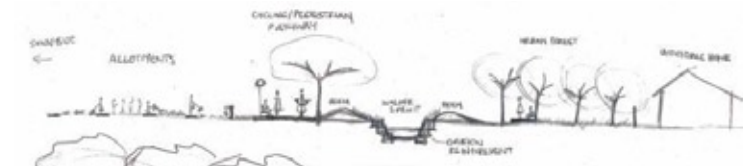


Illustration 183: First conceptual section through the site (Author, 2012).

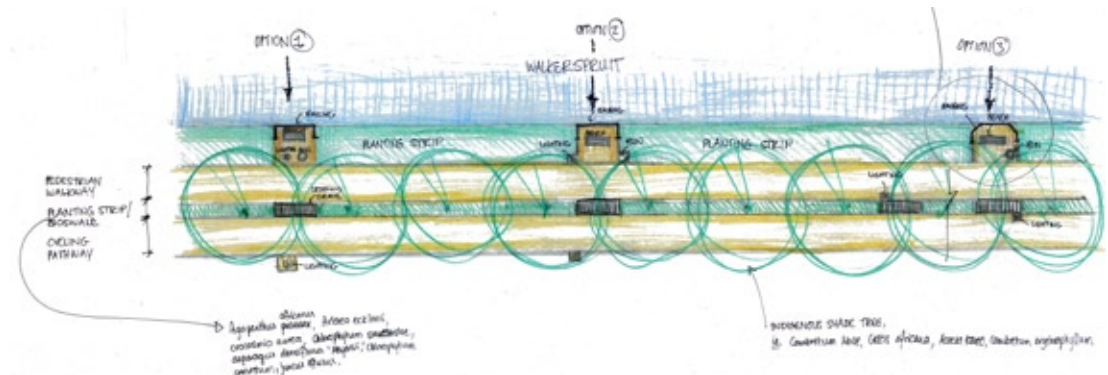


Illustration 186: Exploration of the resting point, crossing grates and lighting configurations alongside the pedestrian & cyclist pathways (Author, 2012).

## ALLOTMENT MANAGEMENT & PROTOTYPES

Prototypes for sustainable food production were explored as guidelines for the general design and management of allotment gardens were determined.

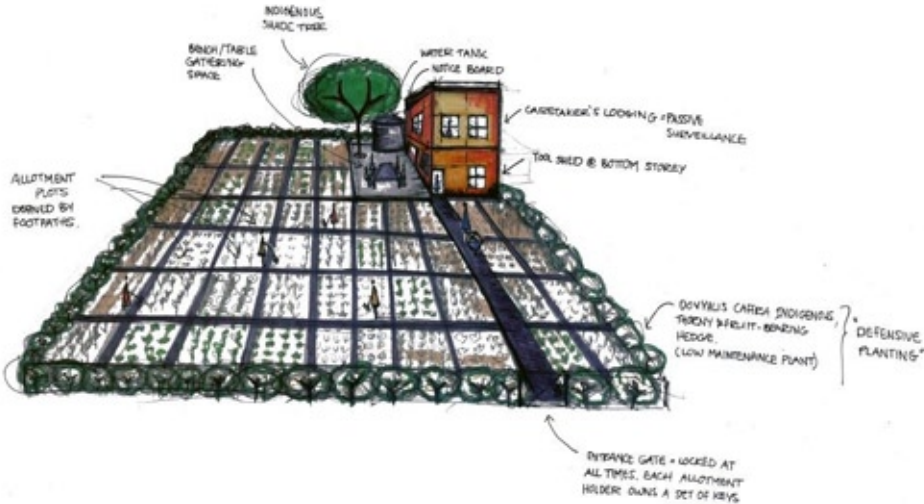


Illustration 187: Allotment Framework Prototype #1: entrance through vegetated gate (Author, 2012)



Illustration 189: Proposed Allotment Management Scheme (Author, 2012)

Allotments are proposed to be managed in the following hierarchy:

### 1). Individual gardeners:

- Members of the community who pay rent for an allotment plot
- Possess a set of keys for the gate of the allotment plot

### 2). Caretaker:

- Lives on the allotment plot and surveys the area for safety and maintenance purposes
- Manages the composting area

### 3). Block Manager:

- Allotment community representative, elected by the allotment holders
- Facilitates general management and caretaker issues

### 4). Committee:

- Consists of representatives and support organizations
- Allocation of funds, organization of community events, co-ordination of training programs, etc

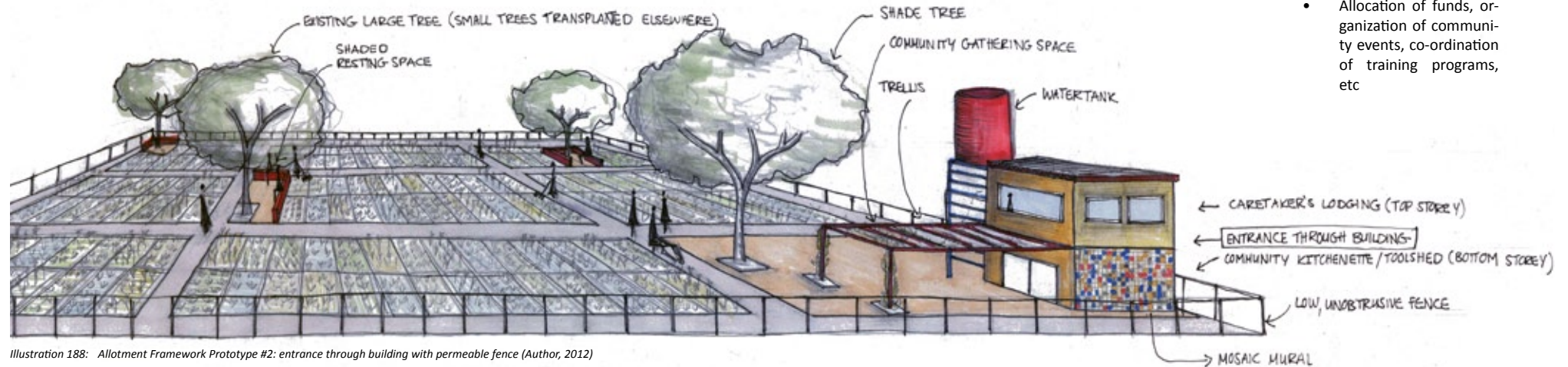
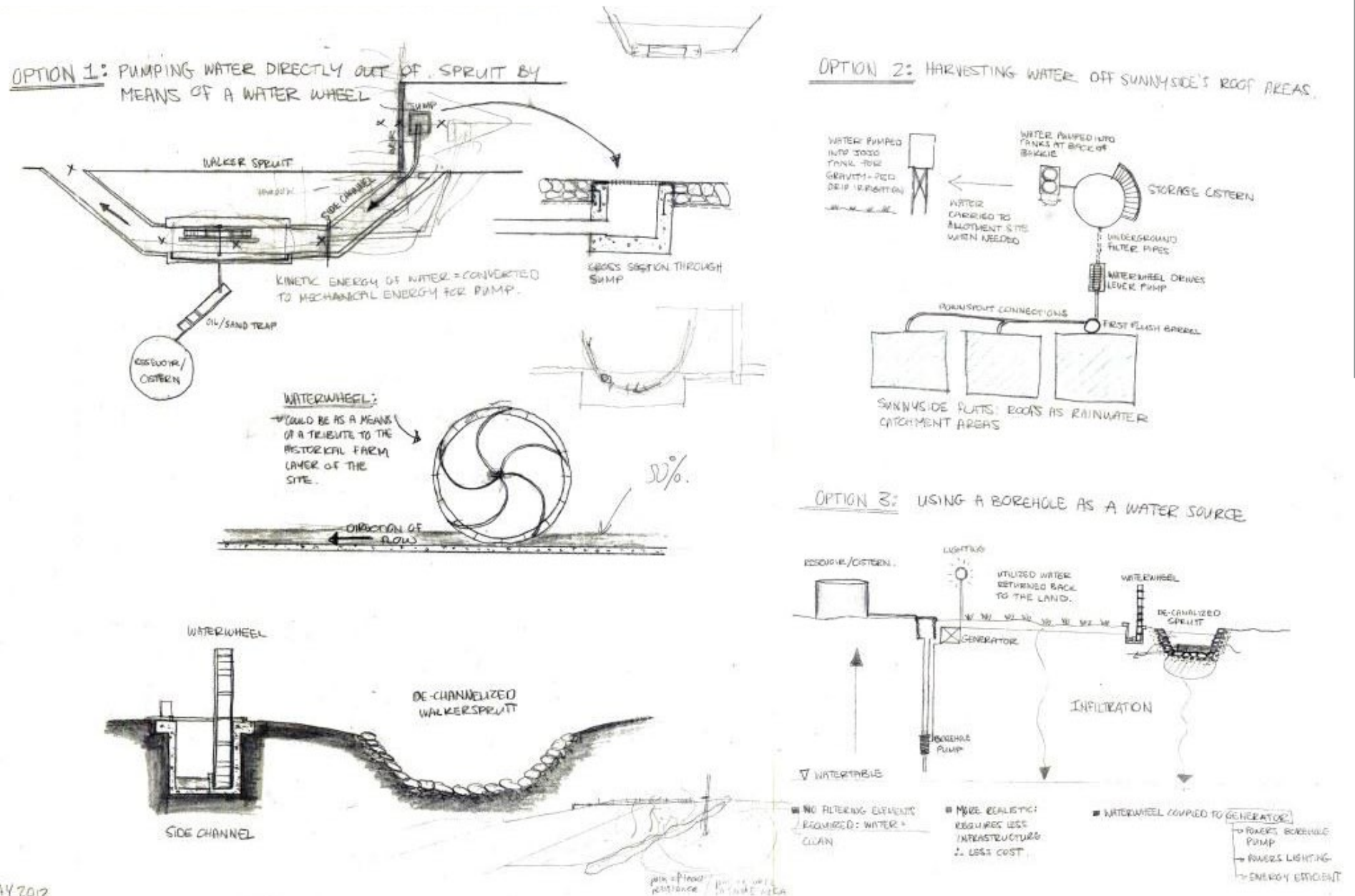


Illustration 188: Allotment Framework Prototype #2: entrance through building with permeable fence (Author, 2012)

## EXPLORING MEANS OF SUSTAINABLE WATER HARVESTING

As a critical part of sustainable food production, various means of obtaining water for irrigation were explored. The recycling of stormwater was an important preference.



MAY 2012

Illustration 190: Exploring various means of harvesting water for urban agriculture (Author, 2012)

CHAPTER 7: DESIGN DEVELOPMENT

UNDERSTANDING THE WATERWHEEL

The waterwheel was finally chosen as the means of obtaining water for the allotment gardens, meeting the design objective of revealing the historical layer of the site, as it was once a farm irrigated in this very manner.

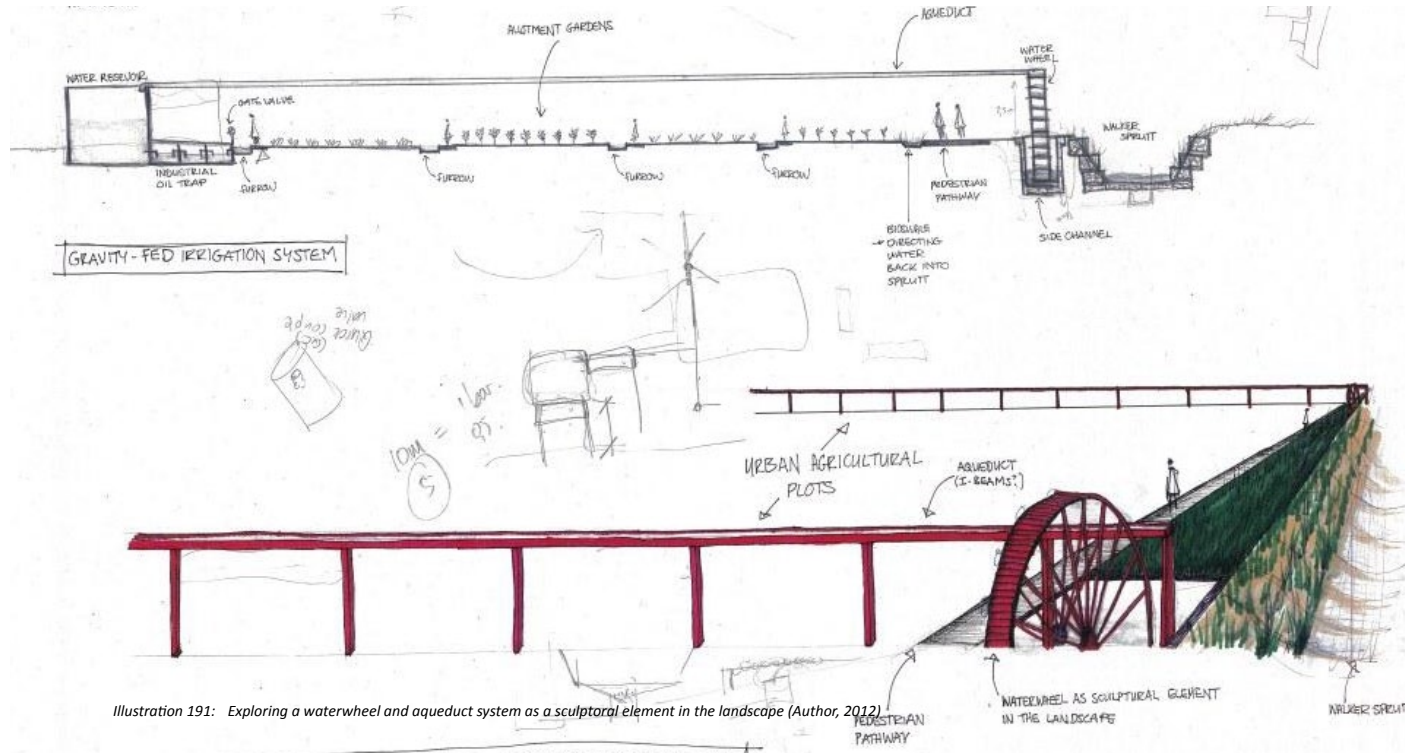


Illustration 191: Exploring a waterwheel and aqueduct system as a sculptural element in the landscape (Author, 2012)



Illustration 192: Waterwheel folly at Parc de la Villette (From: <http://www.corbisimages.com/stock-photo/parc-de-la-villette-waterwheel-folly>)

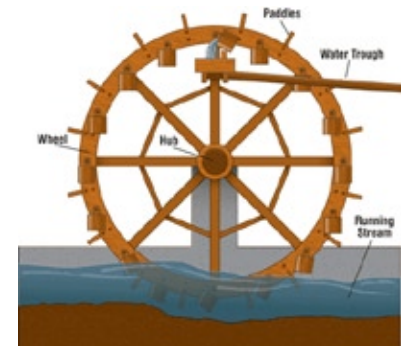


Illustration 193: Typical bucket waterwheel or 'Noria,' meaning 'first water machine' (From: <http://www.machinerylubrication.com/Read/1294/noria-history>)



Illustration 194: An ancient Persian waterwheel and bucket system (From: <http://www.pbase.com/image/47196958>).

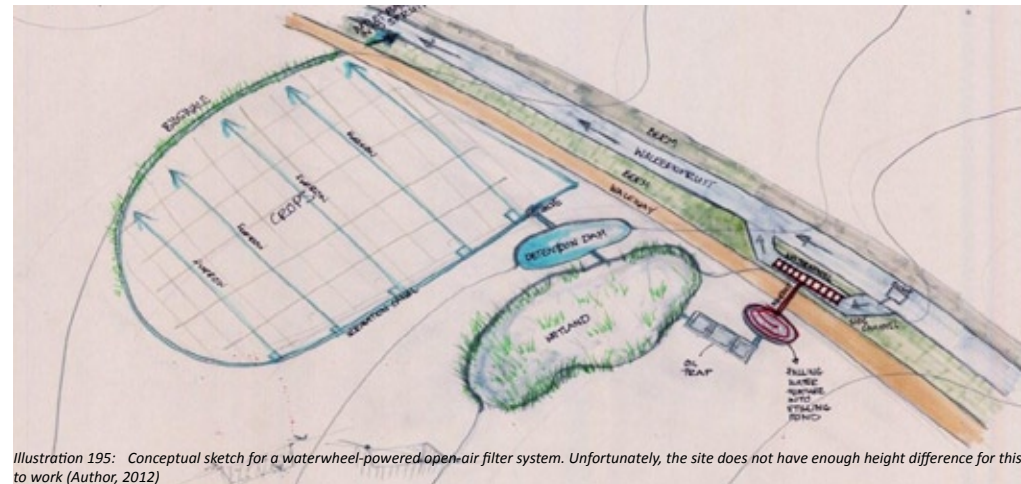


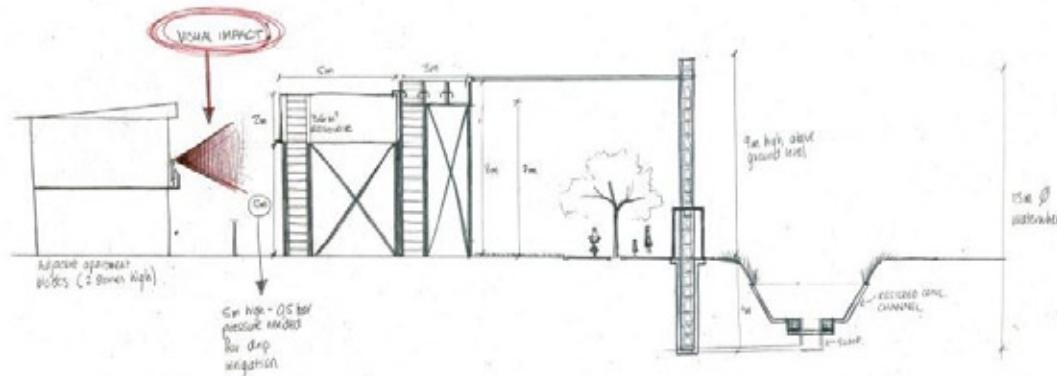
Illustration 195: Conceptual sketch for a waterwheel-powered open-air filter system. Unfortunately, the site does not have enough height difference for this to work (Author, 2012)



## EXPLORING MEANS OF GENERATING WATER PRESSURE

Since the site has very little fall (height difference), means of obtaining an adequate amount of water pressure for the irrigation of the allotments were researched. In order to acquire the needed pressure of 0,5 bars for drip irrigation, the water tank and aqueduct would have to be raised 5 metres high, increasing the size of the waterwheel and resulting altogether in a costly visual impact. As an alternative, water pressure would be acquired via the use of a treadle pump situated on each allotment.

Furrow irrigation was found to be unsustainable since it requires vast quantities of water, while the management of the allotments would be difficult if this method was used: Sluice gates would be required, while tenants would not be able to water their gardens in their own time unless channels are constantly filled with water.



### CONCLUSION:

- x STRUCTURALLY OBTRUSIVE → LARGE STRUCTURES ON SMALL PLANTING AREA
- x HIGH VISUAL IMPACT
- x HIGH COST
- x DON'T HAVE LIMITED WATER SUPPLY (SEE IRRIGATION BUDGET)
- ∴ NOT A NEED FOR WATER-CONSERVING DRIP IRRIGATION
- x RISK OF EXCESS DRAINAGE FROM BASIC FILTERING DEVICES
- DRIP IRRIGATION PIPES RISK A CHANGE OF BLOCKAGE

≠ NOT FEASIBLE!!

### → FURROW IRRIGATION:

- x industrial
- x low maintenance } more realistic
- x low cost
- x old fashioned, traditional
- ↳ Historically used on site (see site analysis!)

Illustration 196: Understanding the visual impact of installing drip irrigation (Author, 2012)

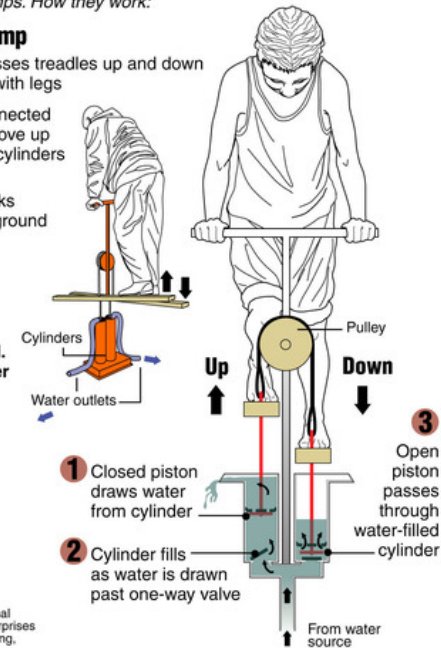
## Human-powered water pumps

A non-profit group helps poor farmers buy income-boosting treadle irrigation pumps. How they work:

### Treadle pump

- Farmer presses treadsles up and down rhythmically with legs
- Pistons connected to treadsles move up and down in cylinders
- Vacuum in cylinders sucks water out of ground
- Water flows into irrigation pipe or tank

Pump can move 9.5 gal. (36 l) of water per minute



© 2008 MCT  
Source: International Development Enterprises  
Graphic: Lee Hulteng, Judy Treble

Illustration 197: Understanding the treadle pump (From: <http://www.mclatdydc.com/2008/02/13/27353/american-pumps-up-third-world.html>).



Illustration 198: Providing the pressure needed for a hose via the use of a low-tech treadle pump (From: [https://www.engineeringforchange.org/news/2012/01/23/ten\\_low\\_tech\\_ways\\_to\\_irrigate\\_crops.html](https://www.engineeringforchange.org/news/2012/01/23/ten_low_tech_ways_to_irrigate_crops.html))

## DECORATIVE ELEMENTS FOR HISTORICAL REFERENCE AND IDENTITY OF PLACE

Since the site was historically furrow-irrigated as a farm, tribute to the furrows of the site will take place through a decorative water channel feature, winding through the site. This playful element was probed along with other features such as a sculptural fence and falling water feature as 'place-making' elements.

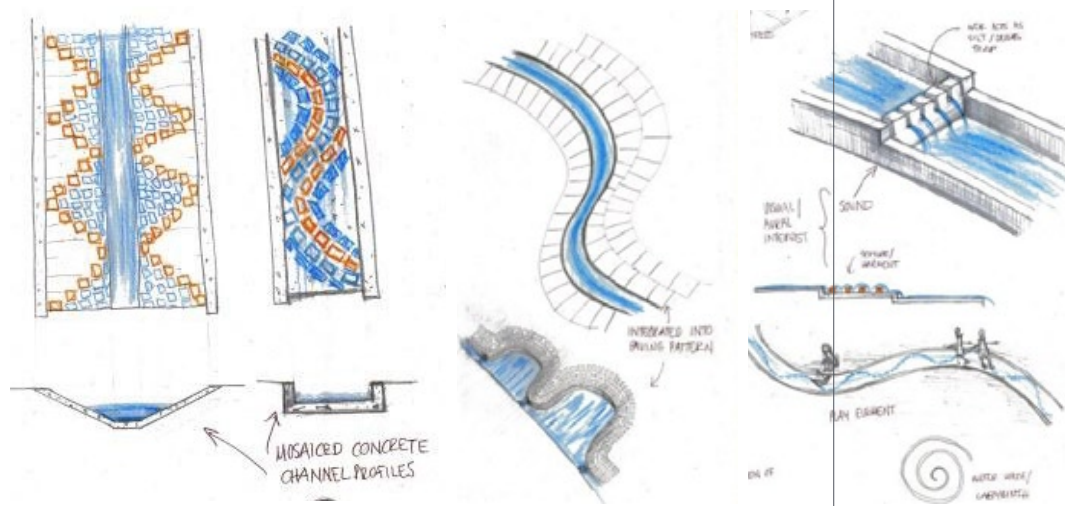


Illustration 199: Exploration of the possibilities of the decorative overflow channel (Author, 2012)

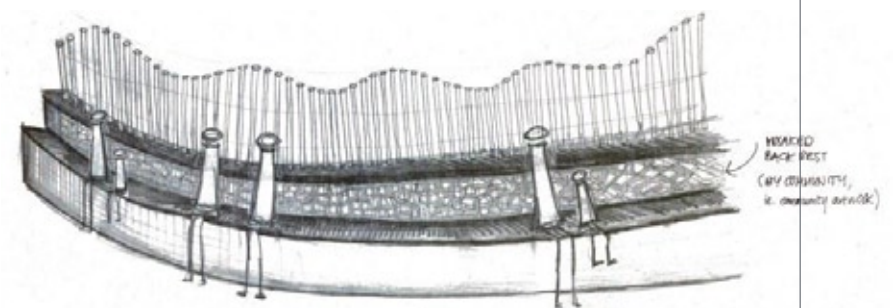


Illustration 201: Exploration of sculptural fence around the allotments with incorporated, decorative seating (Author, 2012).

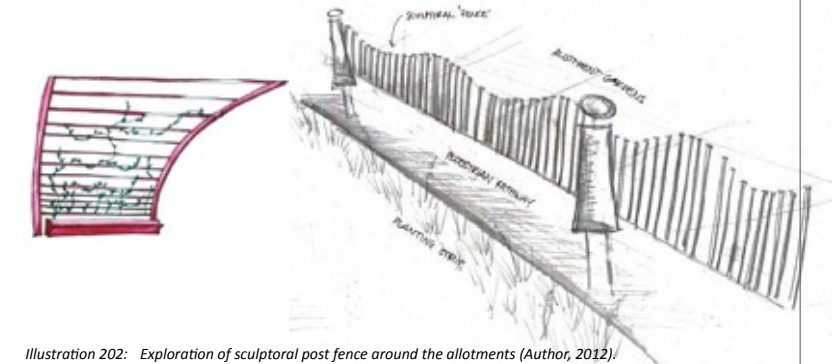


Illustration 202: Exploration of sculptural post fence around the allotments (Author, 2012).



Illustration 200: Inspiration for the open channel element: the Diana Memorial Fountain by landscape architect Kathryn Gustafson, 2004 (From: <http://landscapeandurbanism.blogspot.com/2011/10/europe-journal-diana-memorial-fountain.html>).



Illustration 203: Understanding the 'rain chain', a decorative alternative to a gutter downpipe which serves as inspiration for a falling water feature from the aqueduct to ground level (From: [TheFunTimesGuide.com](http://TheFunTimesGuide.com)).

## SKETCHPLAN DEVELOPMENT

The area for the sketchplan was chosen because the main components included all three natures of the concept as discussed previously. Below is the evolution of the detailed design in plan.

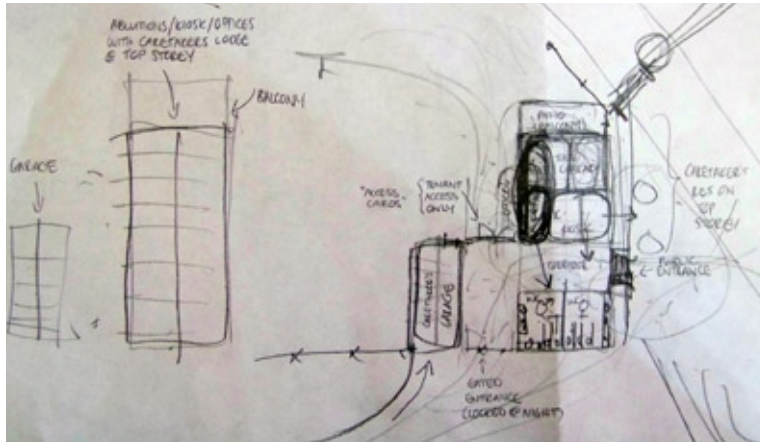


Illustration 204: Spatial exploration of the allotment folly with public abluitions, a kiosk, office, garage and tool library with caretaker's residence and balcony at the top floor (Vosloo & Author, 2012).

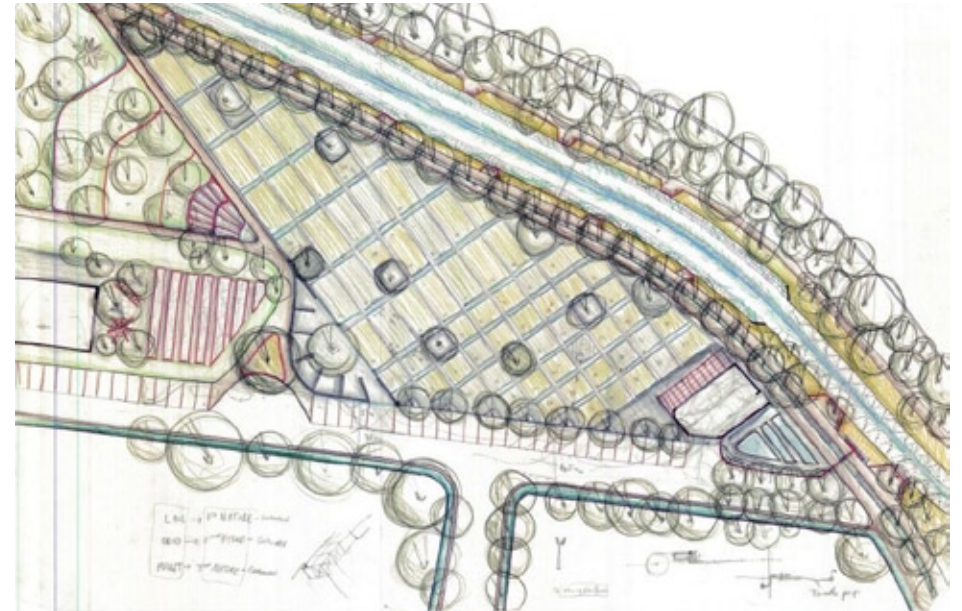


Illustration 205: Sketch Plan attempt #1: Positioning of allotments and caretaker's residence according to the contours, general zoning, and ideas and form of elements (Author, 2012).



Illustration 206: Sketch Plan attempt #2: Incorporation of viewing platforms, turning circle and lingering spaces (Author, 2012).

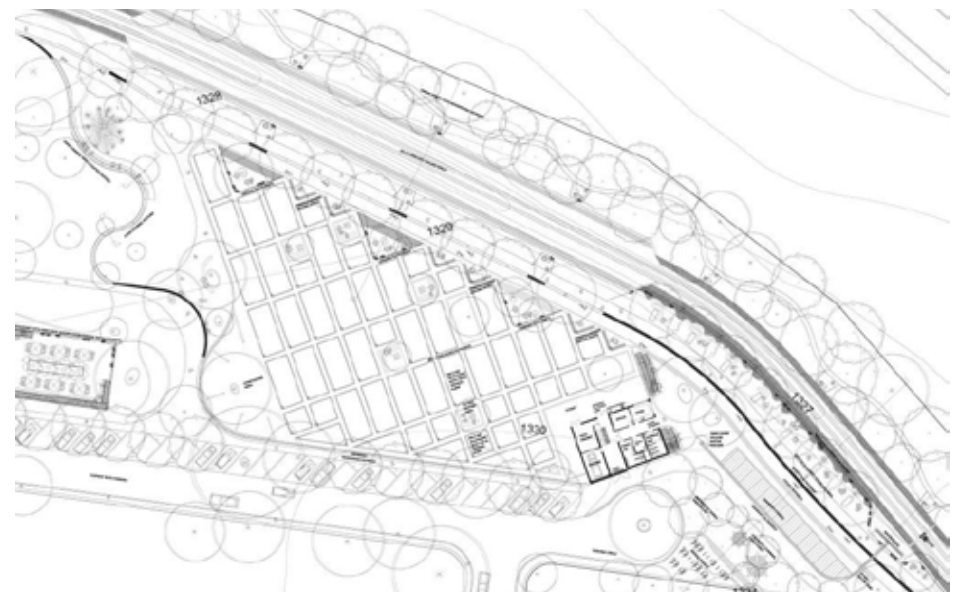
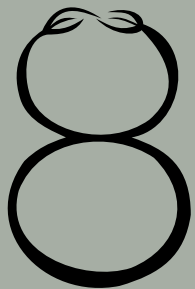


Illustration 207: Sketch Plan attempt #3: Almost there: A refinement of previous ideas. Incorporation of the 'edible arboretum,' restaurant deck and hawker's pergola enveloped by the aqueduct. Moulded channel-seating idea development (Author, 2012).

*“The greatest fine art of the future will be the making of a comfortable living from a small piece of land.”*

*~ Abraham Lincoln*



DETAIL DESIGN

Illustration 208: Vine emerging through broken paving (Author, 2012).

## DETAIL DESIGN

### MASTERPLAN

The masterplan provides a general vision for the focus area in context. This vision forms precedent for what could become the start of a CPUL or Continuous Productive Urban Landscape (see *Chapter 6: 'Framework'*) for the city of Tshwane.

#### The over-arching aims and objectives of the masterplan:

In summarizing the aims and objectives that were synthesized after each previous research chapter, the goals and objectives of the overall masterplan are as follows:

1. **A pedestrian and cycling network should be used to stitch the landscape network together**
2. **In order for this multi-functional landscape to be successful, allotment gardens should be integrated with other job-creating open space and built uses, such as: recreational space, play areas for children, demonstration areas, nurseries/seed banks, market areas, gathering space, public art, etc.**
3. **Public and neighbourhood gathering and lingering spaces need to be provided as place-making elements**
4. **The historical layer of the area should be revealed in order to pay tribute to its heritage**
5. **The Walker Spruit ought to be ecologically restored as much as possible**
6. **Access, legibility and connection of the site must be improved**

#### The masterplan storyline

A cyclical storyline of the sustainable lifestyle process is produced by the masterplan concept. The components of the storyline are described as follows:

##### 1). 'Produce:'

Beginning from the East of the site, a job-creating nursery has been proposed for the supply of seedlings and equipment to the allotment holders. Along with upgraded play equipment, a lemon orchard has also been proposed, and is to be maintained by the nursery tenants. Moving West, the lemon orchard continues opposite the existing

CTMM Power Station, and is proposed to be run by the adjacent Penkidz Outreach Facility.

##### 2). 'Grow & Nurture:'

Progressing further Westwards, towards the middle of the site, the allotment garden scheme is proposed. The area includes a caretaker's cottage, while a restaurant catering for the offices in Clydesdale has also been proposed in the adjacent space. An open lawn area is provided along with a hard surface for hawker's stands. Parking has been proposed via a slipway onto the site for the allotment tenants, while restaurant visitor's parking has been created by converting Plein Street into a one-way; providing parallel parking space. A bus lay-by has also been provided.

##### 3). 'Rest & Recreate:'

Progressing further westwards, crossing over Minni Street, another play area for children has been proposed adjacent to a less-formal canteen, catering for the school children who walk through the site daily. Again, parking has been proposed via a small slipway onto the site and opposite the site where unutilized municipal land lies. More bicycle stands are provided here.

The existing historical Myrtle Park has been left as is, since it is a widely used and sentimental park to the residents of Clydesdale. It will be linked to the site via a paved road surface crossing area bordered with sculptural-seating, providing visual linkage on either side of Walton Jameson Avenue.

##### 4). 'Sell:'

Terminating southwards, one encounters a hardscaped area with mosaiced curved seating walls framing the existing large American white ash (*Fraxinus americana*) trees. This area is proposed to become flexible open space, catering for weekend food markets and related events. A drop-off zone has been provided here which is punctuated with an arrival podium of a large seated planter, framing a proposed sculpture done by a local artist.

##### 5). 'Recycle:'

Finally, crossing over Spuy Street, the existing recycling station has been proposed to become formalized.



Illustration 209: Finalized Masterplan (Author, 2012).

## Connecting the site

The access, legibility and connection of the site have been improved through the following proposed interventions:

The entire masterplan is linked via a pedestrian and cycling pathway, as the existing Kerneels Jong Hiking Trail (discussed in *Chapter 4, 'Site Analysis'*) has been re-vamped and widened. This aids in the interconnection of the fragmented site, making way for a Continuous Productive Urban Landscape (CPUL), discussed in *Chapter 2: 'Theory.'*

The edge conditions of the spruit have been improved as the two metre pedestrian and cycling pathways are separated by a bioswale, lighting and indigenous trees providing shade (*refer to sections C-C and E-E to follow*). Resting and lingering niches overlooking the Walker Spruit include a railing with a bench and litterbin. These occur every 15 metres, between a 2.5 metre-wide planting buffer strip along the length of the spruit.

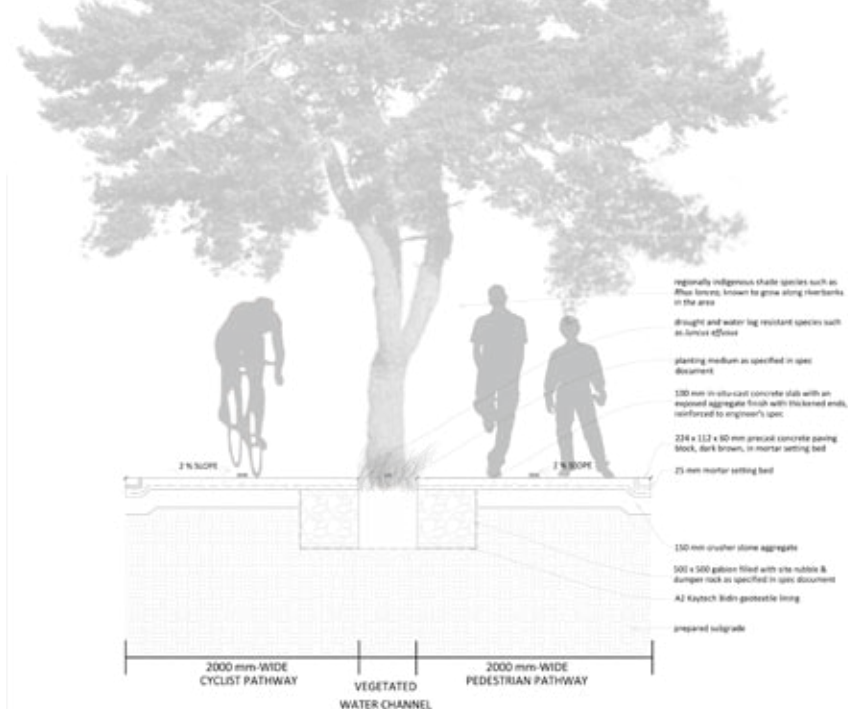


Illustration 210: Pathway detail (Not to scale) (Author, 2012).

Ensuring the legibility and continuity of the site, road crossings are proposed to be paved and bordered with a course aggregate concrete rumblestone (*see illustration 219*). This will also slow down the movement of vehicles for the overpassing pedestrian and cyclist network.

## Ecologically improving the Walker Spruit

The Walker Spruit itself has been proposed to be improved with ecological bio-engineering interventions. In areas where the floodlines are wide and buildings close, the concrete channel is to be mosaiced in accordance with the Consortium Fook Framework (*see Chapter 6: 'Framework'*). The bottom of the channel is proposed to be broken open, making way for a gabion and reno mattress-lined channel which will carry the base flow of the Spruit. As groundwater can once again recharge, aquatic life and vegetation may re-establish here as the water quality is subsequently improved. In areas where floodlines allow, and where buildings are not too close- the concrete channel will be completely removed and replaced with a gabion intervention, widening the spruit and providing more aquatic fauna and flora habitat. Calculations determining these new cross sections are included in appendix A.

The gabions are to be filled with the recycled, broken pieces of the concrete channel that has been excavated. What is more, endemic species have been proposed to be planted along the entire length of the spruit, re-establishing the linear zone of the site as much as possible to its 1st nature.

## Applying the Concept to the Masterplan

One may therefore conclude that the masterplan coincides with the concept in the following ways:

- **'Lines as First Nature:'** the design goal along entire length of the Walker Spruit is to restore it as much as possible to its 'First Nature.' As the ecological functions of the spruit are re-introduced, regionally indigenous vegetation has been re-established along this defining linear element of the site.
- **'Grid as Second Nature:'** The flexible, enabling framework for the proposed allotment gardens and lemon orchards will reveal the 'Second Nature' of the site's historical layer as a farm. Simultaneously, catalytic, productive community space will be created.
- **'Surface as Third Nature:'** Flexible, open space has been provided throughout the

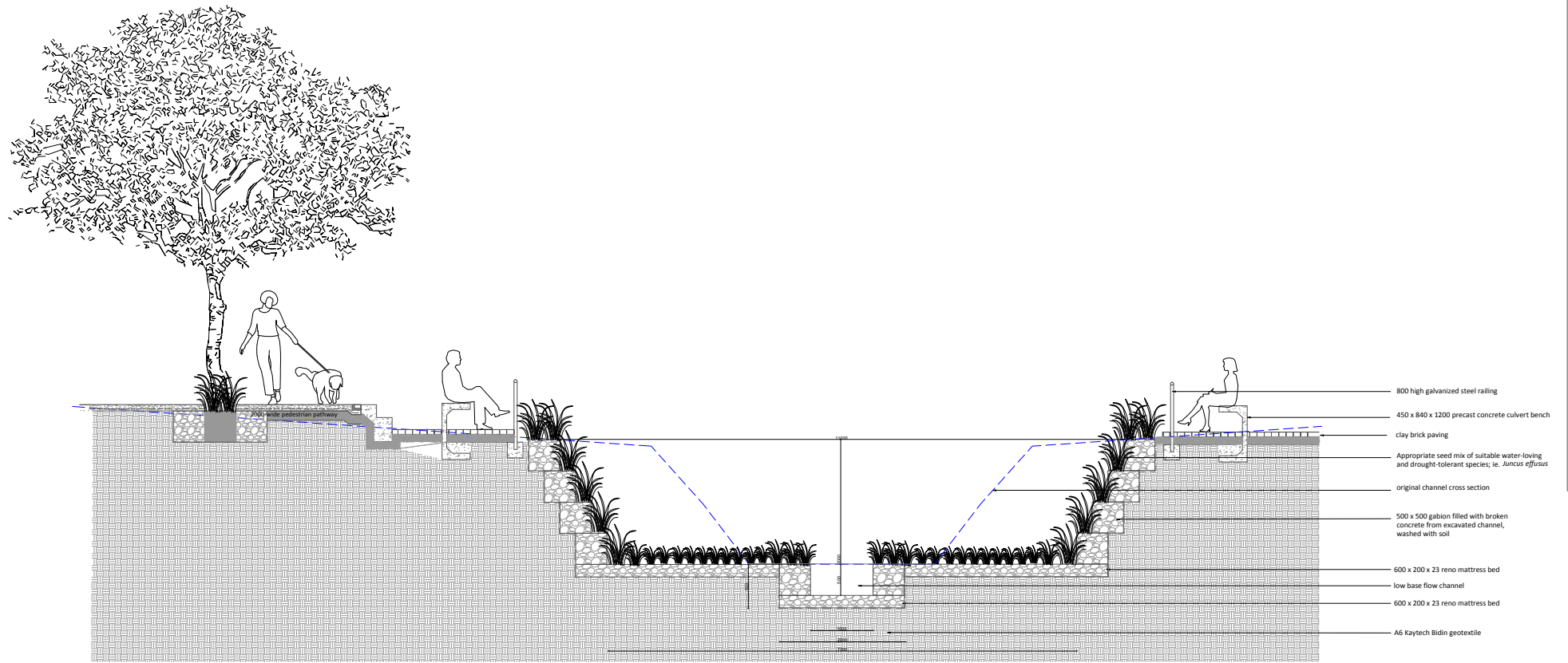


Illustration 211: New cross section of the de-channelized Walker Spruit (Author, 2012).

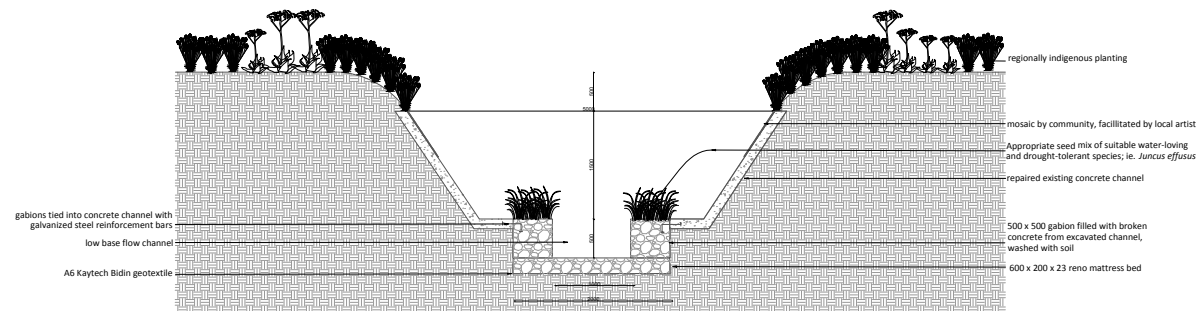


Illustration 212: New cross section of the existing Walker Spruit concrete channel with an ecological base flow intervention (Author, 2012).



## Plant Palette

### Selected species for the 'regionally-indigenous planting strip' along the Walker Spruit

'Regionally indigenous' or endemic species of the Gauteng Shale Mountain Bushveld (refer to 'Vegetation' in Chapter 4, 'Site Analysis') will be re-introduced along the length of the Walker Spruit as a 2.5 metre-wide planting strip alongside the pedestrian pathway. This palette will also be used within the 'urban forest' proposed north of the site as the '1st Nature of the area is re-established.



Illustration 213: *Asparagus suaveolens* (From: <http://www.prota4u.org/protav8.asp?g=psk&p=Asparagus+suaveolens+Burch>)



Illustration 214: *Felicia muricata* (From: <http://plants.newplant.co.za/pub/size/4/page/118>)



Illustration 215: *Kalanchoe rotundifolia* (From: <http://www.plantzafrica.com/plantklm/kalanrotund.htm>)



Illustration 216: *Dicoma zeyheri* (From: <http://www.plantzafrica.com/plantklm/macedzeyheri.htm>)



Illustration 217: *Pellaea calomelanos* (From: <http://www.ispot.org.za/node/147161>)

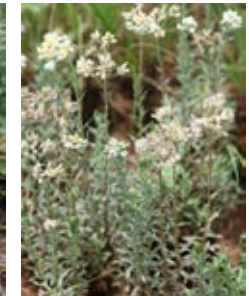


Illustration 218: *Helichrysum rugulosum* (From: <http://keys.lucidcentral.org>)



Illustration 219: *Veronia natalensis* (From: <http://www.plantzafrica.com/planttuv/vernonnat.htm>)



Illustration 220: *Searsia magalismontana* (From: <http://www.plantzafrica.com/plantqrs/searsiamagalisis.htm>)



Illustration 221: *Ancylobotrys capensis* (From: [http://174.120.145.98/~bronberg/Fauna\\_and\\_flora/Plants/Plants.html](http://174.120.145.98/~bronberg/Fauna_and_flora/Plants/Plants.html))



Illustration 222: *Helichrysum nudifolium* (From: <http://www.plantzafrica.com/planthij/helichrysnudi.htm>)



Illustration 223: *Athrixia elata* (From: <http://www.ispot.org.za/node/154120>)



Illustration 224: *Hibiscus pusillus* (From: [http://www.ispot.org.za/species\\_dictionary/Hibiscus](http://www.ispot.org.za/species_dictionary/Hibiscus))

### Selected species for the planting within the Walker Spruit

As soil is washed in between the cavities of the broken-concrete filled gabions, a recommended seed mix of appropriate water loving species and grasses will be established as the aquatic habitat of the spruit is increased. Below are examples of such species.



Illustration 225: *Gomphostigma virgatum* (From: <http://plants.newplant.co.za/pub/size/4/page/136>)



Illustration 226: *Hesperantha coccinea* (From: <http://www.africanbulbs.com/page78.html>)

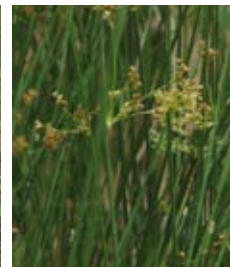


Illustration 227: *Juncus effusus* (From: <http://www.nps.gov>)

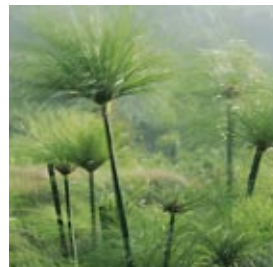


Illustration 228: *Cyperus proflifer* (From: <http://www.greenmeadowgrowers.com>)



Illustration 229: *Crinum macowanii* (From: <http://www.plantzafrica.com/plantcd/crinumcamp.htm>)



Illustration 230: *Gunnera perpensa* (From: <http://www.plantzafrica.com/plantefga/gunnerperp.htm>)

## Material Palette

Robust, hardy materials have been chosen as to lower the maintenance of the site. Below is a general palette of the materials proposed.



Illustration 231: Grass blocks used for allotment pathways and parking areas (From: <http://gardenista.com/posts/eco-friendly-paving-solutions>)



Illustration 232: Mosaic of suitable recycled objects for the decorative channel (From: <http://www.riversonfineart.com>)



Illustration 233: Exposed aggregate concrete for the pedestrian and cycling pathways (Author, 2010)



Illustration 238: Gravel beneath the 'edible arboretum' (Author, 2012)



Illustration 234: Red powder-coated galvanized steel (From: [http://www.gardenvisit.com/garden/parc\\_de\\_la\\_villette\\_paris](http://www.gardenvisit.com/garden/parc_de_la_villette_paris))



Illustration 235: Play equipment sculptured from felled trees on site (From: <http://www.harbertonford.org>)



Illustration 236: Fencing (From: <http://www.specifile.co.za>)

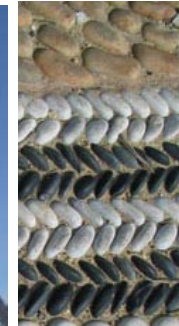


Illustration 237: Mosaiced pebbles (Author, 2012)



Illustration 239: Food gardens provide 'spirit of place' (Author, 2012)



Illustration 240: Mosaic artwork by the community (Courtesy of Joubert, 2009)



Illustration 241: Gabions filled with broken concrete (From: [http://nitinwirenetting.com/gabion\\_mesh](http://nitinwirenetting.com/gabion_mesh))



Illustration 242: Concrete water channel (From: [http://www.ski-epic.com/2007\\_london\\_trip/index.html](http://www.ski-epic.com/2007_london_trip/index.html))



Illustration 243: Norman Eaton-inspired paving patterns (Courtesy of Joubert, 2009)

## SKETCHPLAN

A detailed design has been produced for the allotment scheme proposed in the masterplan, as this is where all three of the components of the design concept crystallize (*refer to Chapter 7, 'Design Development'*). The sketchplan will be explained from both a technical and design point of view. Once the water circulation, irrigation and allotment space has been explained and reasoned as design drivers, the sketchplan will be explained zone by zone.

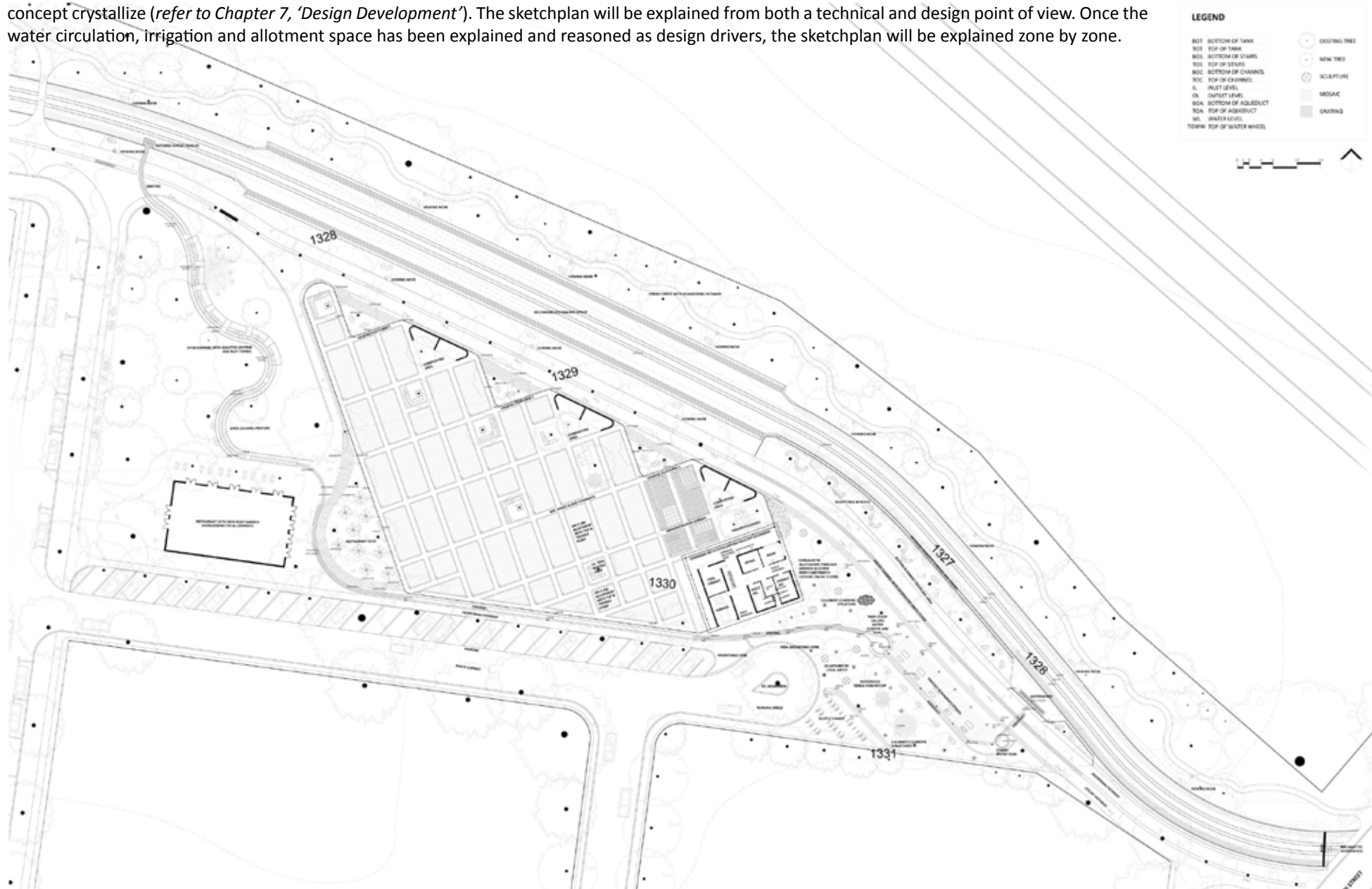


Illustration 244: Finalized Unrendered Sketchplan (Not to Scale) (Author, 2012)



Illustration 245: Finalized Rendered Sketchplan (Not to Scale) (Author, 2012)

**CHAPTER 8: DETAIL DESIGN**

**Design objectives of the sketchplan:**

Along with the goals already achieved in the masterplan, the following objectives drove the development of the sketchplan:

1. **The sustenance of urban farming should be provided by the harvesting of storm-water**
2. **In areas where agriculture is to be zoned, small existing trees need to be transplanted, while large existing trees must be conserved where possible**
3. **Provisions are needed for the composting of organic waste near spaces allocated for urban farming**
4. **Opportunities for watching and learning from the gardens should be provided as an educational element in the design**
5. **Allotments must be managed by a caretaker and secured with unobstructive fencing**
6. **The communities of Clydesdale and Sunnyside East must be united and involved in the design process**

**MAKING WAY FOR URBAN AGRICULTURE**

**Water as a design driver**

An in-depth technical investigation of the irrigation of the allotments was undertaken as a starting point, since it was believed that water would become a powerful design driver, especially considering the theme of this dissertation.

A number of irrigation methods were investigated (as illustrated in Chapter 7, 'Design Development'). The waterwheel method was eventually chosen, since it pays tribute to the heritage of the site, being a farm irrigated by the Walker Spruit through the use of waterwheels during Sunnyside's early development (see Chapter 3, 'Context'). This method is suitable today, since the Walker Spruit has essentially become a storm water channel, and the water quality is considered suitable enough to be used as long as debris has been filtered out (see Chapter 4: 'Site Analysis').

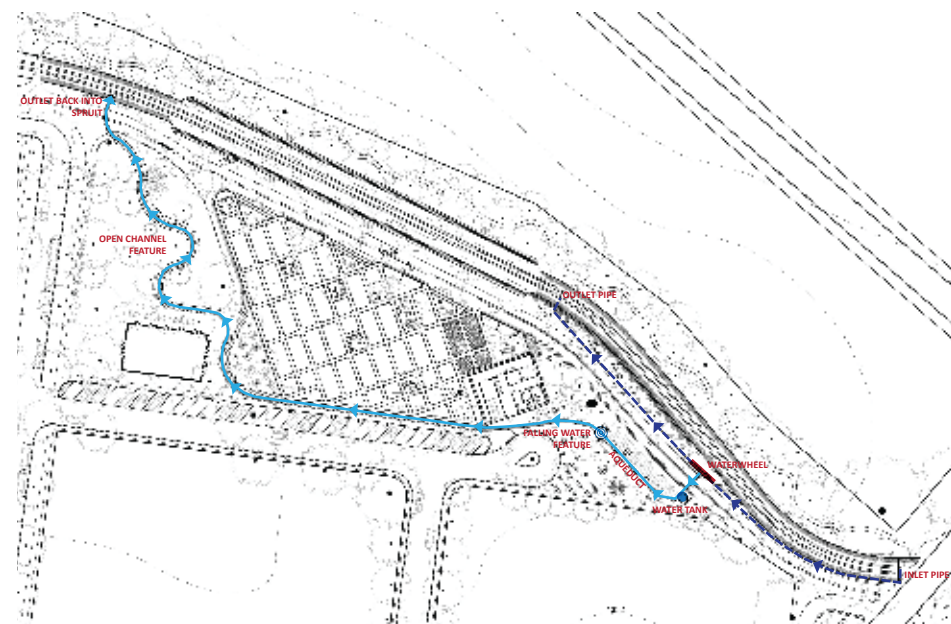


Illustration 247: Diagram indicating the passage of water through the site as a defining element of the design (Author, 2012).

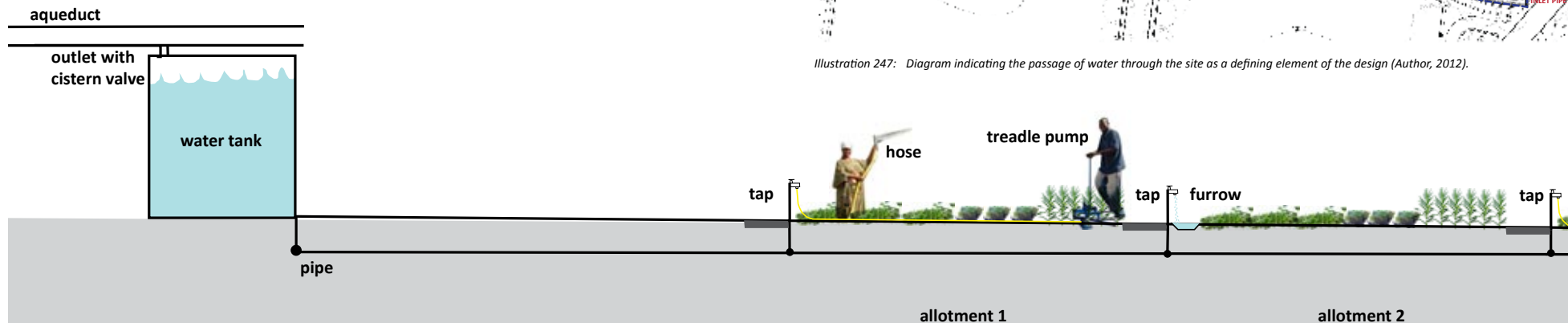


Illustration 246: Conceptual diagram of the proposed irrigation scheme for the allotment gardens (Author, 2012).

An old-fashioned bucket waterwheel has been proposed to lift the required water out of the Walker Spruit into a raised aqueduct which channels the water into a sized tank positioned at the highest point of the site for the irrigation of the plots. The waterwheel will become a sculptural, as well as functional element within the site. Once the tank has been filled, the water will continue to be channeled along the aqueduct, and fall down to ground level via an oversized 'rain chain' falling water feature. The water then continues to flow within a decorative water channel as it pays reference to the historic irrigation furrows that were once used in the area. The decorative channel winds through the site whilst creating a playful, animating element of interest before it gets channeled back into the spruit.

Calculations have been done to prove that there is an adequate amount of water in the spruit during the dry season for this irrigation scheme to be implemented. These are attached in Appendix A.

### Irrigation Scheme

The appropriately-sized water tank (*calculations can be seen in Appendix A*) is strategically-placed upon the highest point of the site. It will be connected via an underground pipe system to the allotment plots, each allotment acquiring its own tap and treadle pump. The treadle pump system has been proposed to supply the adequate amount of water pressure, should tenants wish to water their crops with a hose. The tap could also be opened to fill irrigation furrows if the method is preferred to the given individual (*refer to illustration 246*).

### Understanding the waterwheel system

In order for the waterwheel to function, the existing levels of the site were examined to determine the requirements for a gravity-fed system. *Refer to illustration 248.*

Taken from the highest point of the site, situated beneath the bridge at Minni Street, an appropriately-sized inlet pipe will suck water from the base flow channel of the spruit (*see Section 1*). This will be piped at 2% slope towards the waterwheel.

As the waterwheel lifts water at a rate of approximately two litres per second, water will constantly flow through the pipe system and will exit the pit of the waterwheel via a pipe laid at a 5% slope. This will encourage the propulsion of the system. The water is released at the appropriate level downstream (*see Section 2*).

The water from the spruit is channeled to the waterwheel via a pipe system to ensure the right speed and amount of water, and to prevent damage to the wheel during a flood event.

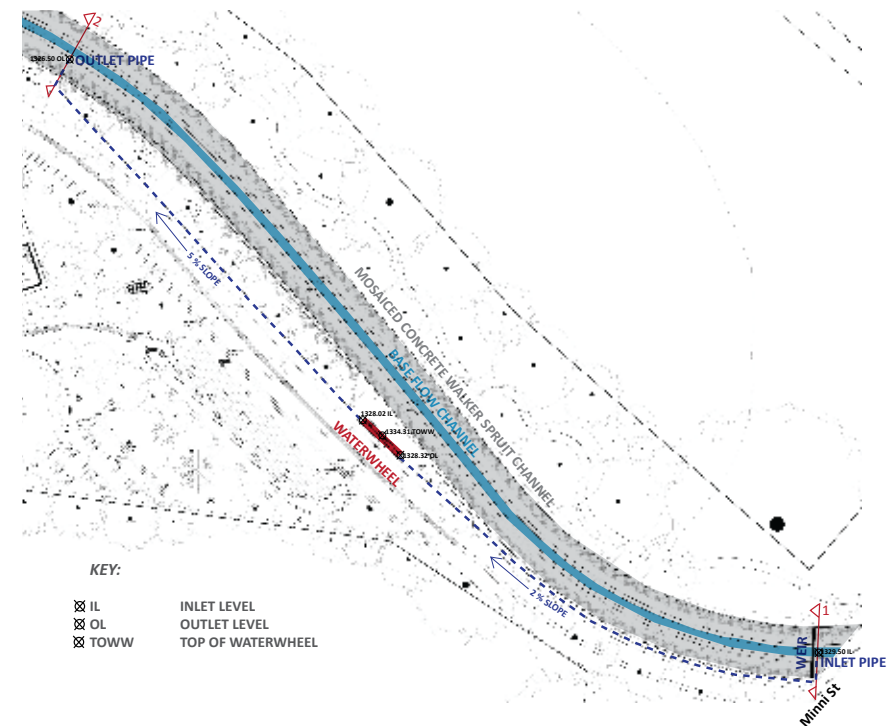


Illustration 248: Diagram indicating the pipe inlets and outlets of the waterwheel from the spruit (Author, 2012).

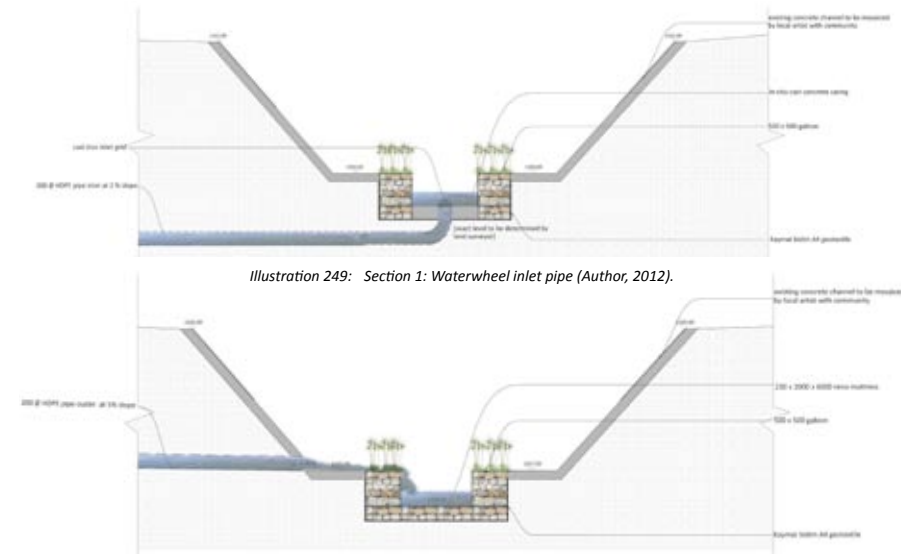


Illustration 250: Section 2: Waterwheel outlet pipe (Author, 2012).

## Creating an 'urban forest'

As explained in *Chapter 4: 'Site Analysis,'* there are many indigenous trees which pepper the site, planted by municipality in 2001. Because these trees are still relatively small, it is possible for them to be transplanted elsewhere to make way for the expanse of land required for the allotment plots. It has hence been proposed for the trees to be moved to the northern length of the Walker Spruit. Interspersed with the existing trees of the area, along with added new trees- this dense tree zone will become an 'urban forest.'

Contrasting with the busy activities proposed along the Southern side of the spruit, this

area will become a more quiet, contemplative area with a meandering pathway running through it, opposed to the busy cycling and pedestrian pathways on the opposite end.

Furthermore, large and well-established trees will be reserved within the allotment area, providing opportunity for shaded resting points where a bench or climbing structure for children and drinking fountains could be placed beneath. A conceptual sketch of this idea is shown in *illustration 188, Chapter 7: 'Design Development.'*



Illustration 253: Location of the urban forest within the sketchplan (Author, 2012).



Illustration 251: Before: Northern side of the Walker Spruit (Author, 2012).



Illustration 252: After: Photomontage depicting the proposed 'urban forest' of transplanted young trees to make way for the allotments (Author, 2012).

## Safety: The fence perimeter

A visually unobtrusive post and panel fence has been selected which will border the area of the allotment gardens. This will be the standard height of 1.8 metres for the security of the area. The services and caretaker's building will form part of this fence boundary and be the only entrance through to the gardens. Tenants will swipe their access cards in order to enter the site through a separate entrance within the building.

The selected fence is from the 'Betafence' catalogue ([www.betafence.co.za](http://www.betafence.co.za)). The local company is proposed to install the 'Betaview' fence system which has the following properties:

- Made from 3mm high tensile Class A Galvanized wire, with fusion-bond PVC coating
- Vandal resistant: cut and climb proof. The small apertures are finger proof that is anti-climb, and anti-cut with conventional cutters
- High visibility levels through the fence
- Corrosion resistant, low maintenance and long life due to PVC coating.



Illustration 255: Diagram indicating the fence boundaries (Author, 2012)



Illustration 254: Precedent of the chosen fence at Waterkloof Corner Retail Centre, Pretoria (Author, 2012)

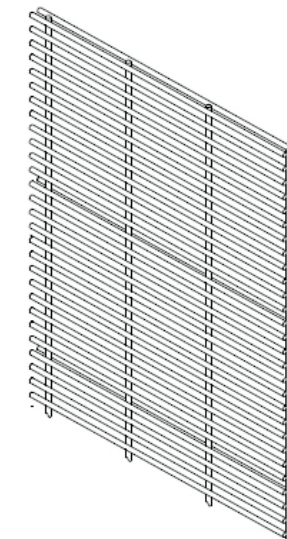


Illustration 256: 3-D of the chosen fence detail (From: [www.betafence.co.za](http://www.betafence.co.za))



Explaining the resultant sketchplan zone by zone

The sketchplan is to be explained in detail, zone by zone. Please refer to the key plan below for the location of each zone within its given context of the design.

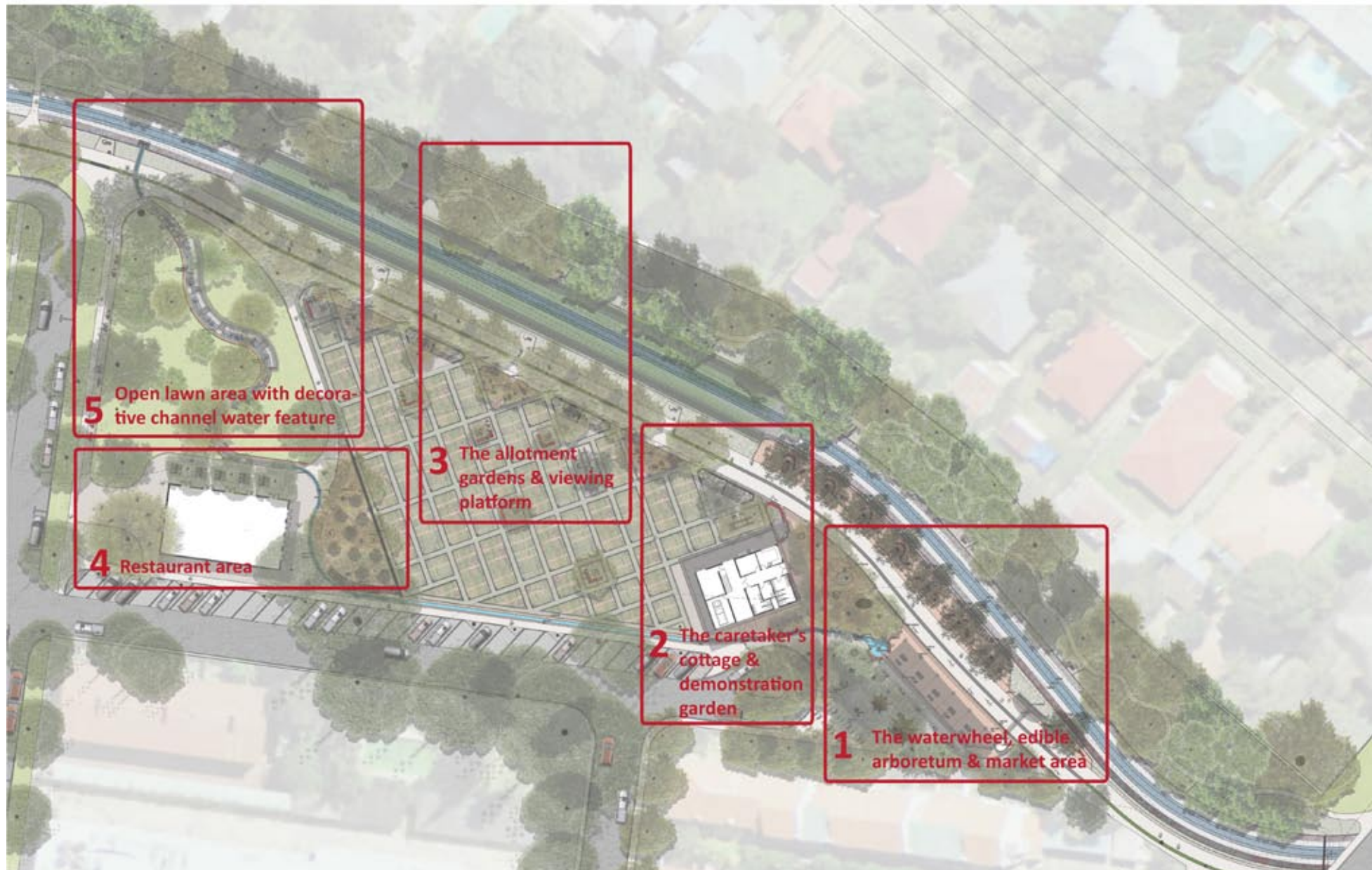


Illustration 257: Sketchplan Zones (Author, 2012).



Illustration 258: Orientation of Zone 1 within the sketchplan (Author, 2012).

### Zone 1: The waterwheel and market area

Zone One includes the proposed waterwheel, aqueduct with an attached pergola for hawkers' stands, the falling water feature, bicycle stands and an 'edible arboretum' beneath which children's play equipment will be situated. This flexible open space will serve as a market overflow area during busy weekend periods. Bicycle stands are also included at the arrival point of the zone.

The 'edible arboretum' will include small to medium-sized indigenous trees which produce edible fruit. It is proposed that each tree will be labeled appropriately, encouraging what to taste, touch and smell. A list of the selected species are included in the plant palette to follow.

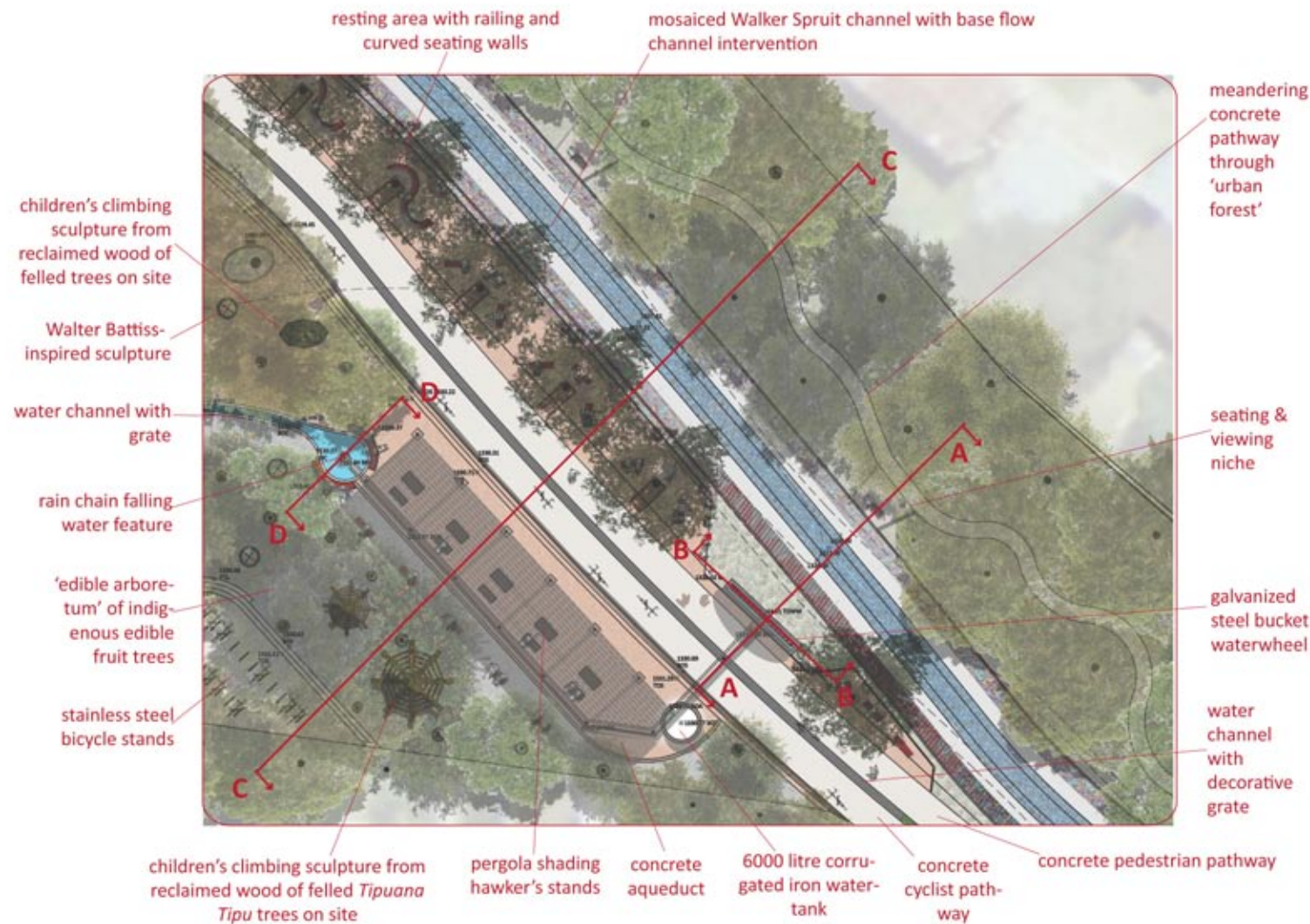


Illustration 259: Zone One of the sketchplan in detail (scale 1:400) (Author, 2012).

**CHAPTER 8: DETAIL DESIGN**

The waterwheel will become a sculptural, yet functional feature in the landscape, as it pays tribute to the heritage of the area as a farm. It will lift water from the spruit into a tank for irrigation, the overflow trickling through a decorative water channel....

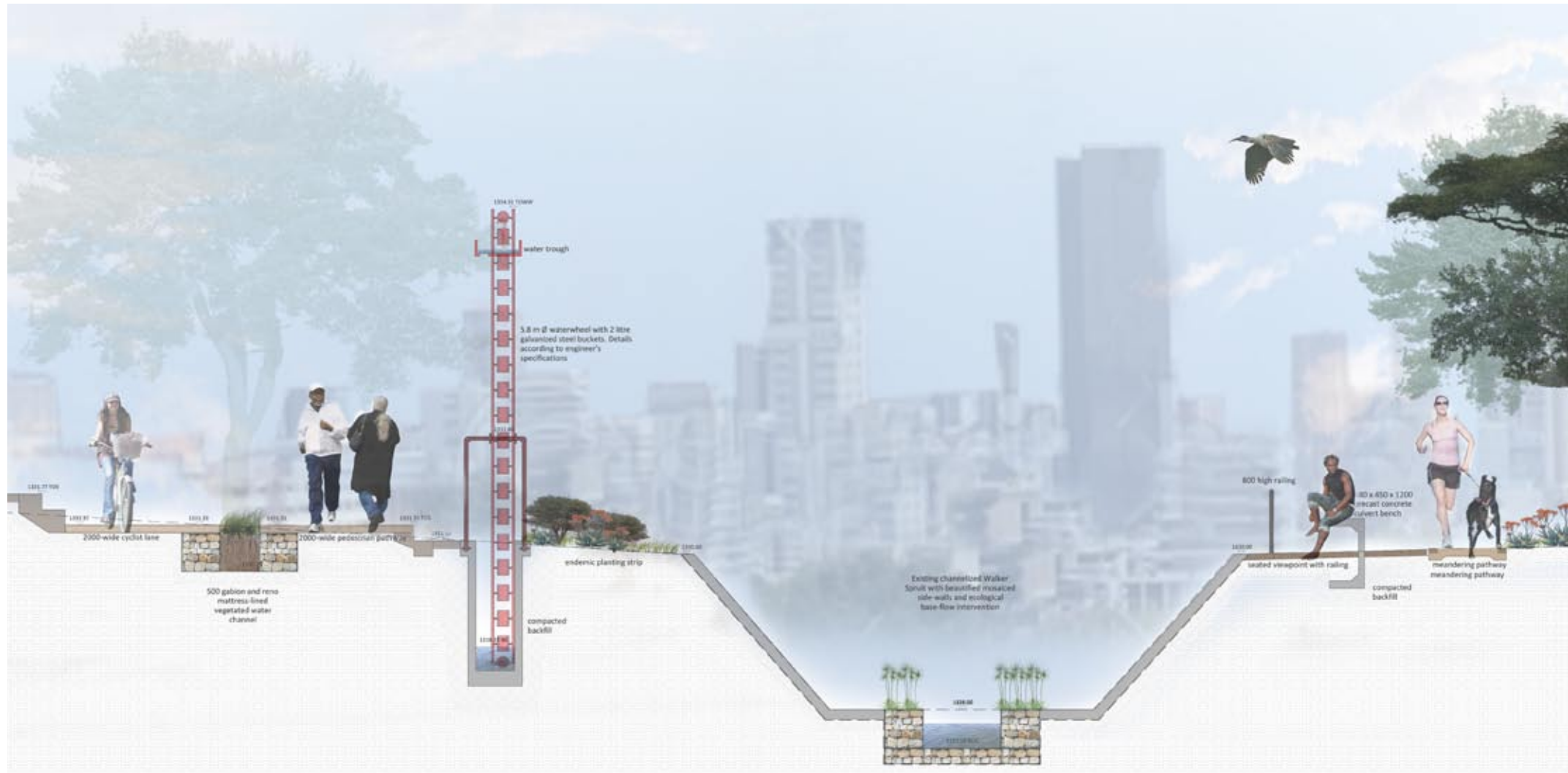


Illustration 260: Section A-A indicating the waterwheel, aqueduct and tank relationship (not to scale) (Author, 2012).

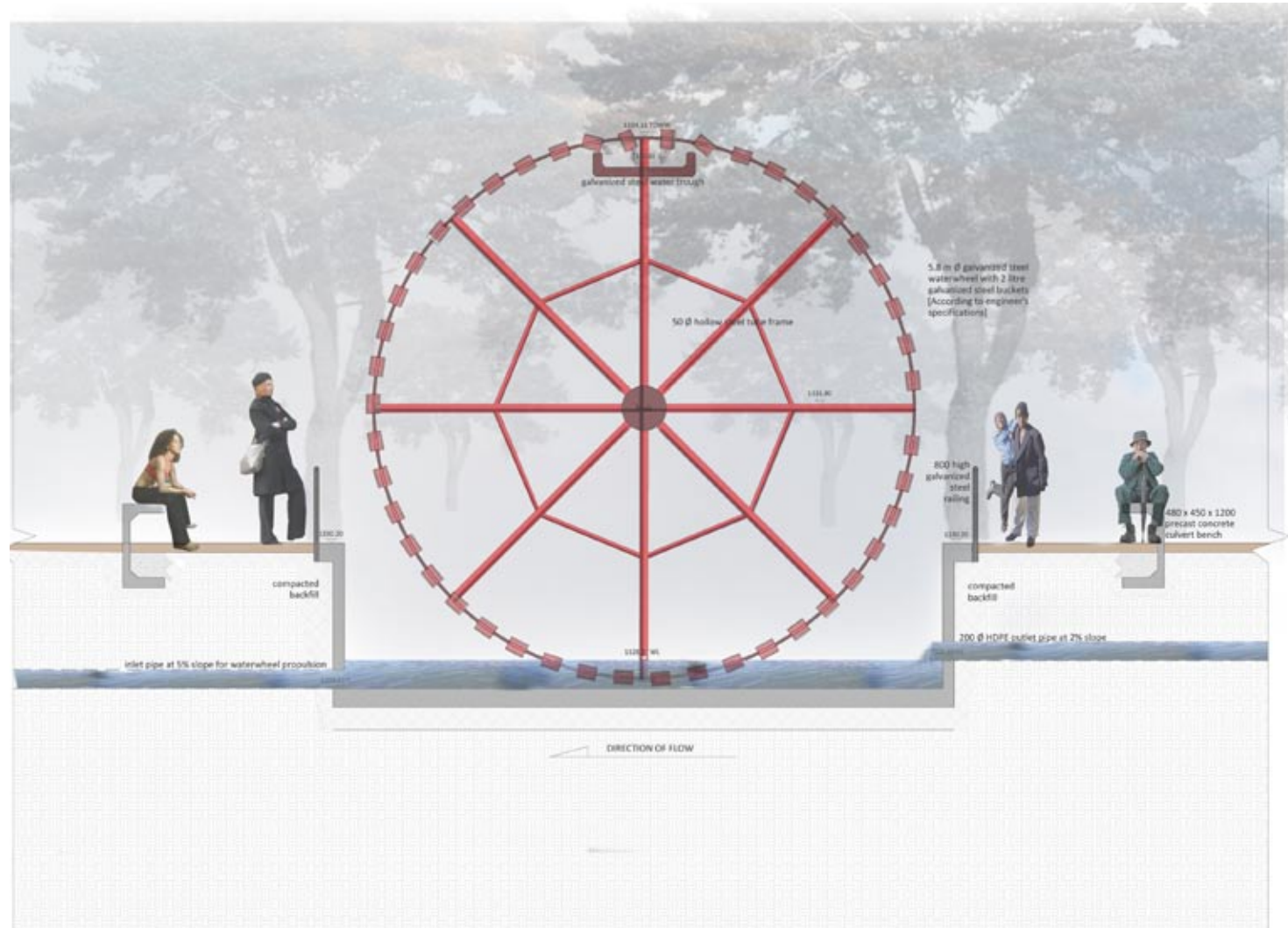


Illustration 261: Section Elevation B-B indicating the waterwheel as seen from the pedestrian/cycling pathways (not to scale) (Author, 2012).

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A pergola is attached to the aqueduct, as the indigenous, edible and hardy *Rhoicissus tridentata* (Bushman's Grape) vine shades hawker's stands beneath. This may overflow into a market area during weekends, beneath the 'edible arboretum' of indigenous edible fruit trees which shade children's climbing structures and bicycle stands....



Illustration 26z. Communicating the bicycle stands, 'edible arboretum,' aqueduct and pergola shading the hawker's stands and the Walker Spruit with an ecological base flow intervention (not to scale) (Author, 2012).



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The falling water feature has been inspired by the rain chain, a decorative alternative to the downpipe of a typical gutter system (refer to illustration 207 in Chapter 7, Design Development'). The buckets will echo those of the bucket waterwheel as the water falls into a mosaiced pool, bordered by low seating walls. This will be implemented by a local artist.



Illustration 263: Section Elevation D-D of the rain chain-inspired 'falling water feature' and pool (not to scale) (Author, 2012).

## Selected species for the edible arboretum

Indigenous tree species were selected for the 'edible arboretum,' a designated area where a collection of edible fruit-producing trees will be grown to shade the overflow market area. Each tree will be appropriately labelled with its name and what to taste, touch and smell as an educational feature in the landscape.



*Grewia hexamita*  
(‘Giant Raisin’)

- 5m height x 6m spread
- The two-lobed edible fruits are enjoyed by both people and birds alike

Illustration 264: *Grewia hexamita* fruit (From: [operationwildflower.org.za](http://operationwildflower.org.za))



*Pappea capensis*  
(‘Jacket-plum’)

- 7m height x 6m spread
- The furry green capsuled fruits split to reveal shiny black seeds covered in a brilliant orange fleshy jelly that is delicious

Illustration 265: *Pappea capensis* fruit (From: <http://www.plantzfrica.com/plantnop/papcap>)



*Rhus chirindensis*  
(‘Red currant’)

- 7m height x 9m spread
- The shiny, red-rounded berries are slightly fleshy, with a sweet-sour taste. Enjoyed by people, birds and monkeys alike.

Illustration 269: *Rhus chirindensis* fruit (From: <http://www.planthis.com.au/>)



*Vangueria infausta*  
(‘Medlar’)

- 6m height x 6m spread
- The fruits are sweet, tasting like dried pears. Mampoer can be made from the ripe fruit, while the seeds can be roasted

Illustration 266: *Vangueria infausta* fruit (From: <http://www.thegardenlady.org>)



*Ziziphus mucronata*  
(‘Buffalo-thorn’)

- 9m height x 10m spread
- The cherry-sized fruits can be eaten fresh or dried, ground to a meal and cooked as a porridge. Ground seeds were used as a coffee substitute by soldiers during the Anglo-Boer War.

Illustration 267: *Ziziphus mucronata* fruit (From: <http://www.searchdictionaries.com>)



*Phoenix reclinata*  
(‘Wild Date Palm’)

- 6m height x 4m spread
- Produces masses of tasty orange-brown fruits, tasting similar to cultivated dates. Enjoyed by people, baboons, monkeys and fruit-eating birds

Illustration 268: *Phoenix reclinata* fruit (From: <http://www.planthis.com>)



*Rhus dentata*  
(‘Nana-Berry’)

- 5m height x 4m spread
- The clustered, red berries may be eaten raw or mixed with milk (especially in famine times)

Illustration 270: *Rhus dentata* fruit (From: <http://www.thegardenlady.org>)



*Halleria lucida*  
(‘Tree Fuchsia’)

- 6m height x 5m spread
- The sweet, rounded fleshy fruits ripen to black and may be eaten raw

Illustration 271: *Halleria lucida* fruit (From: <http://www.wildcard.co.za/blog>)



*Rhus leptodictya*  
(‘Mountain karee’)

- 6m height x 7m spread
- The small shiny flat fruits ripen to a yellow-brown. These pleasant-tasting fruits can be eaten raw. A strong sweet-sour beer is may be brewed from them

Illustration 272: *Rhus leptodictya* fruit (From: <http://witkoppenwildflower.co.za/>)



*Dovyalis caffra*  
(‘Kei-Apple’)

- 4m height x 3m spread
- The large rounded fruits are tasty, rich in vitamin C, and can be eaten fresh. Can be made into a delicious jam or jelly.

Illustration 273: *Dovyalis caffra* fruit (From: <http://www.plantzfrica.com/plantcd/dovycaf.htm>)



*Euclea natalensis*  
(‘Natal Ebony’)

- 10m height x 10m spread
- The rounded fleshy pea-sized fruits are in striking multicoloured clusters ranging from green to yellow, orange, bright red and black. People, monkeys and birds are particularly fond of the fruits

Illustration 274: *Euclea natalensis* fruit (From: [http://plants.newplant.co.za/pub/large/euclea\\_](http://plants.newplant.co.za/pub/large/euclea_))



*arpephyllum caffrum*  
(‘Sourplum’)

- 12m height x 11m spread
- The oval fleshy plum-like fruits ripen to a shiny red and have a sweet-sour taste. A drink similar to lemonade is made by adding sugar and water to the peeled fruit. The fruit can also be made into delicious jams and jellies.

Illustration 275: *Euclea undulata* fruit (From: <http://www.plantzfrica.com/>)





## Zone 2: The caretaker's cottage and demonstration garden

Zone Two includes a services building with the caretaker's lodging on the first floor. A designated caretaker will live on site and be in charge of the maintenance and surveillance of the allotment plots. This building serves as the only entrance through which the allotment tenants can access their plots. This is to ensure the maximum security for the site as access is through a controlled system. The public wing of the building includes male, female and disabled ablution facilities, a kiosk and an admin office. A gated entrance to the allotments themselves will be opened through the use of access cards which will be issued to each tenant. Public entrances will be locked at night.

Furthermore, a 'tool library,' where tenants are able to rent gardening tools is joined to a garage for the caretaker's private use. A large 'stoep' has been provided beneath the balcony of the caretaker's home with a small kitchenette for the tenant's use. This overlooks a permaculture demonstration garden where tenants as well as the visiting public are educated about the possibilities that their food gardens can hold. This is adjacent to a composting area alongside a play area beneath retained existing large *Celtis africana* trees. A 'viewing platform' (illustrated in section F-F) overlooks the demonstration garden, providing the public with visual access to this educational feature.

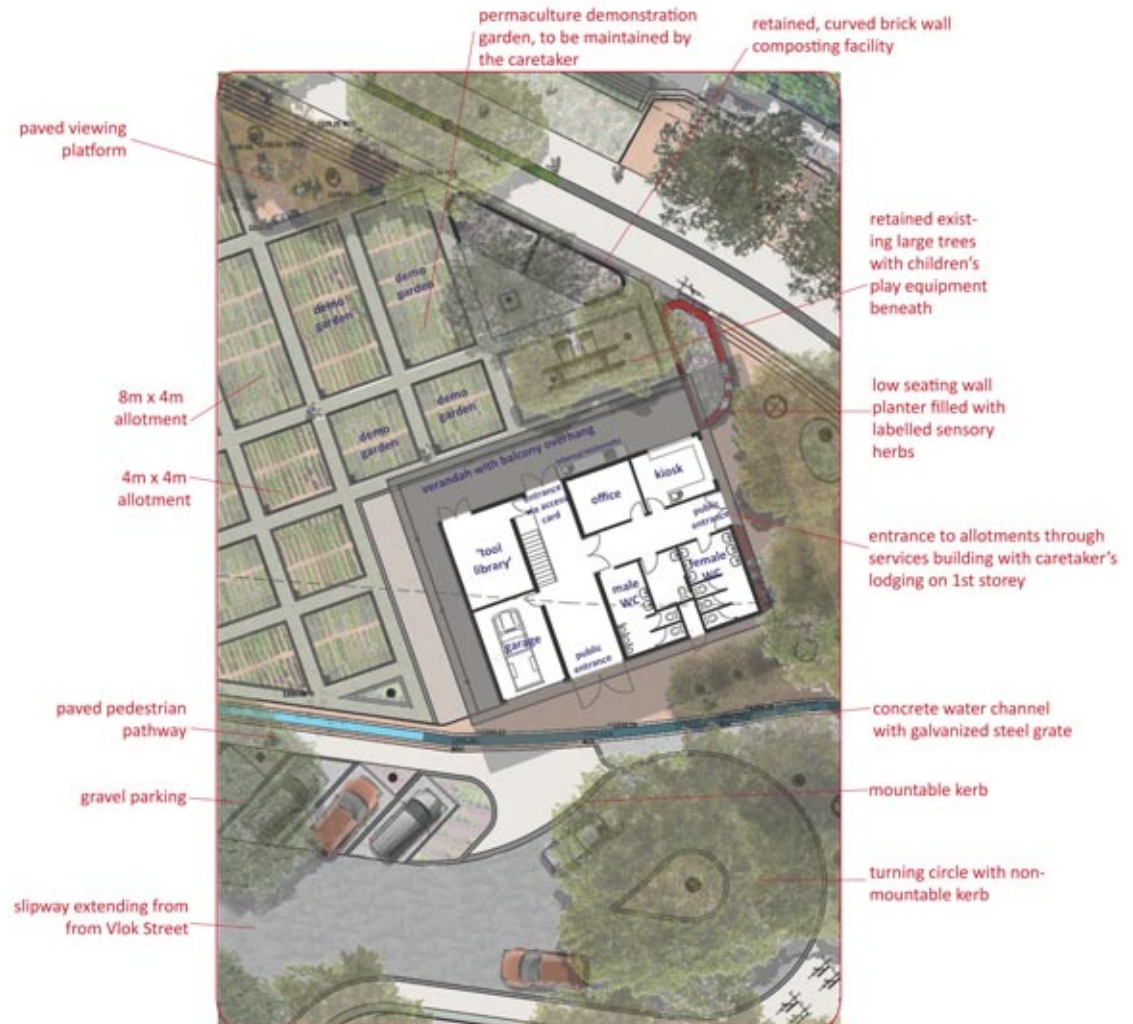


Illustration 276: Zone 2 of the sketchplan in detail (scale 1:400) (Author, 2012).



Illustration 277: Orientation of Zone 3 within the sketchplan (Author, 2012).

### Zone 3: The allotment gardens and viewing platform

Zone three houses the de-channelized Walker Spruit as seen in *illustration 211*. It includes one of three viewing platforms which overlooks the allotment gardens, allowing passers-by to linger and watch the gardeners at work as the plots change with the seasons. These are raised 1 metre high with compacted fill from the spruit excavations.

There are two sizes of allotments to choose from: an 8m x 4m meter family-sized allotment and a smaller 4m x 4m allotment. These are bordered by 0.8 meter-wide grass block pathways. It is proposed the pathways are angled in such a way that they become the drainage channels of the allotment plots, running into the bioswale separating the pedestrian and cyclist pathways (*refer to section E-E*).

Composting facilities consist of 0.5 metre-high brick walls which envelop organic waste heaps. These will be turned and maintained by the caretaker.

Resting spaces beneath retained existing large trees will be paved and consist of low seating walls and drinking fountains. Others will house climbing structures and play equipment for children.

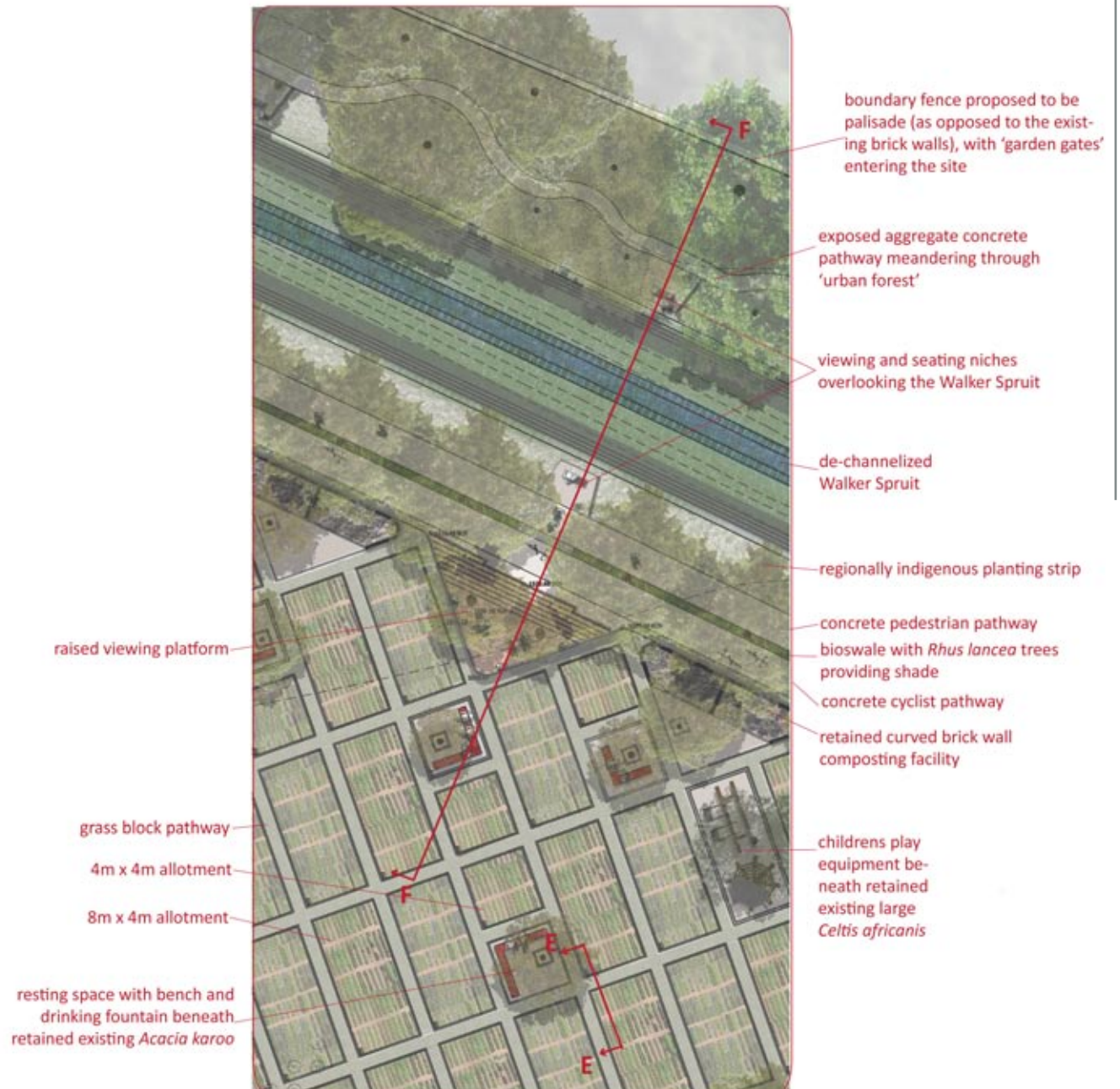


Illustration 278: Zone 3 of the sketchplan in detail (scale 1:400) (Author, 2012).

**CHAPTER 8: DETAIL DESIGN**

Alongside the pedestrian and cycling pathways, passers-by can rest at the 'viewing and seating niches' provided which are nestled within a 2.5 metre wide endemic planting strip and overlook the de-channelized Walker Spruit. Alternatively, one may pause and linger atop one of the three 'viewing platforms' which overlook the allotment gardens. A quieter, meandering pathway is provided through the 'urban forest' on the opposite side of the spruit.



Illustration 279: Section F-F indicating one of the raised platforms, the pedestrian and cyclist pathways, and the de-channelized Walker Spruit alongside the urban forest (Author, 2012).



wide pedestrian path-way | viewing & seating niche | widened & ecologically-enhanced walker spruit with base flow channel intervention | viewing & seating niche | urban forest of transplanted & new indigenous trees

**CHAPTER 8: DETAIL DESIGN**

The allotment gardens are bordered by 800mm-wide permeable grass block pathways, which simultaneously act as run-off channels. These channelled-pathways follow the contours and direct water into the bioswale separating the pedestrian and cycling pathways.



Illustration 280: Section E-E of a typical grass block pathway separating the allotments (not to scale) (Author, 2012).



Illustration 282: Zone 4 of the sketchplan in detail (scale 1:400) (Author, 2012).



Illustration 281: Orientation of Zone 4 within the sketchplan (Author, 2012).

### Zone 4: The Restaurant Area

Zone four indicates the proposed restaurant area. Precidents for the restaurant are indicated in the illustrations below. It is suggested that a herb roof garden and balcony are positioned specifically for diners to overlook the decorative water channel and patchwork of allotment gardens.

Additionally, a curvilinear platform provides an additional outdoor seating area for restaurant guests which could double up as an events area. This 1 metre-high platform is designed to overlook the allotment gardens and will be filled with material from the excavations done of the spruit works.



Illustration 283: Blue Crane Restaurant, Nieuw Muckleneuk Trim Park, Pretoria (Author, 2012).



Illustration 284: De Kas Restaurant and food gardens, Amsterdam (From: <http://www.restaurantdekas.nl/>)

**CHAPTER 8: DETAIL DESIGN**

The raised restaurant platform is filled with the material from the spruit excavations. This allows for guests to overlook the patchwork of the allotments while they dine on the fresh produce that may be sold to the restaurant by the tenants themselves. This area hopes to create an awareness and appreciation of the sustainability of fresh, healthy produce.

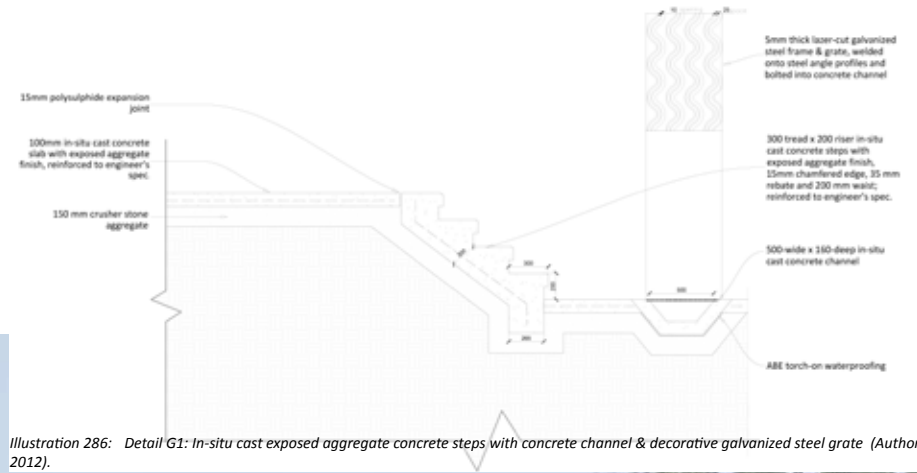


Illustration 286: Detail G1: In-situ cast exposed aggregate concrete steps with concrete channel & decorative galvanized steel grate (Author, 2012).

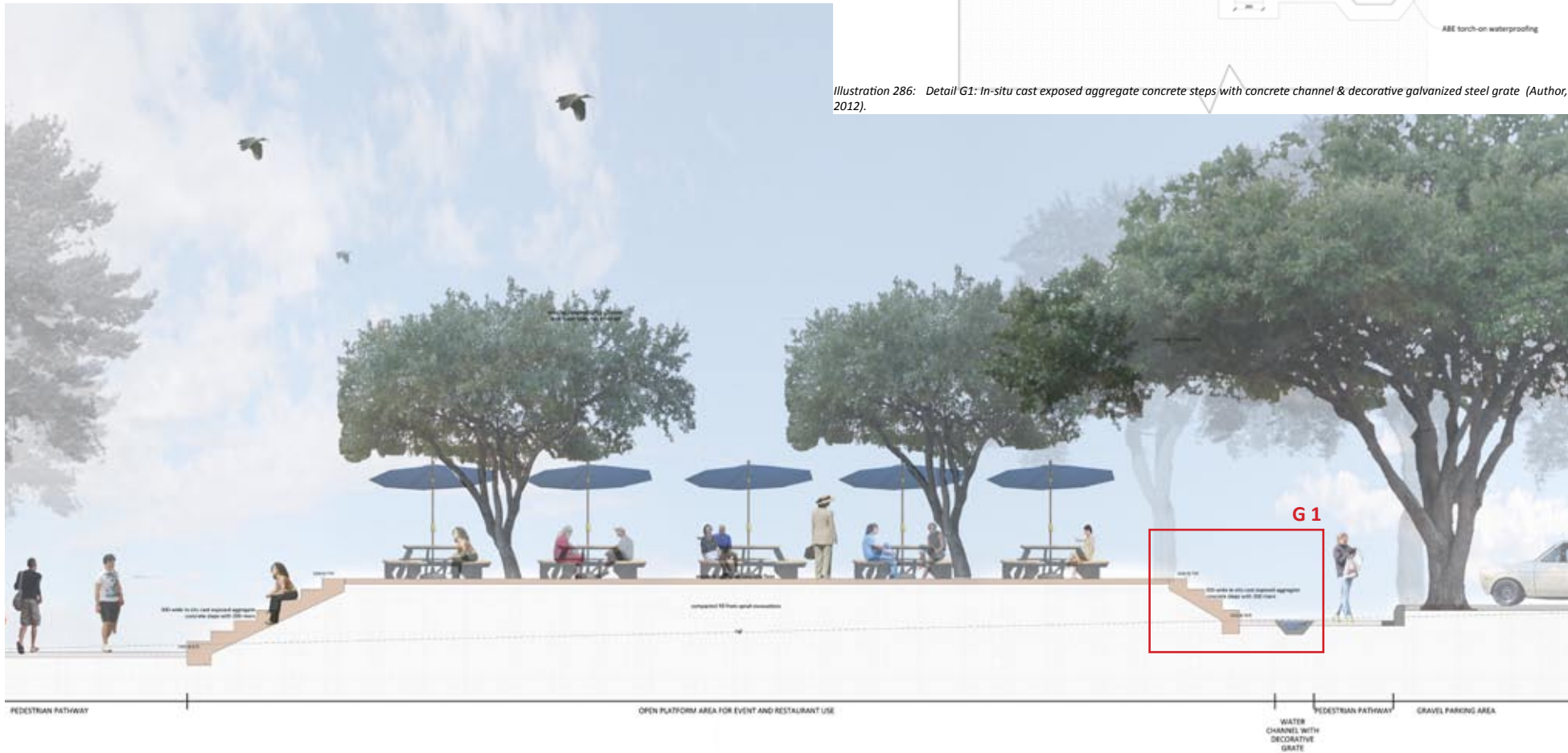


Illustration 285: Section G-G indicating the restaurant platform overlooking the allotments (not to scale) (Author, 2012).

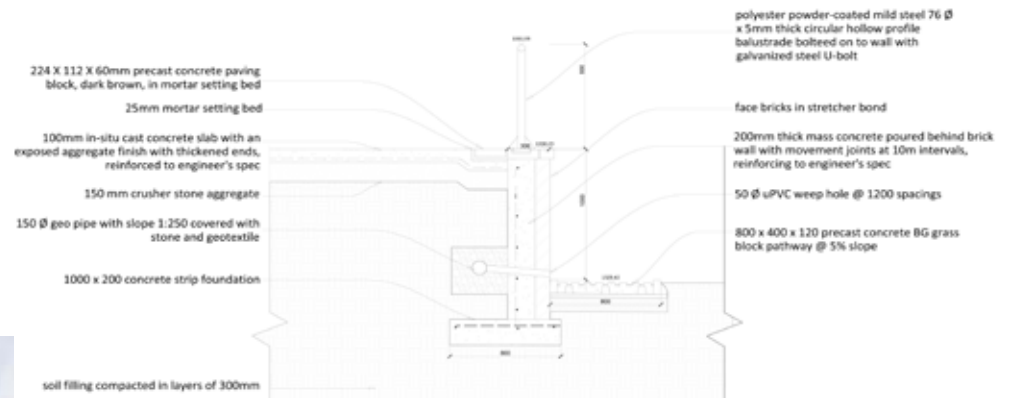


Illustration 288: Detail H1: Reinforced masonry & concrete cantilevered retaining wall (not to scale) (Author, 2012).

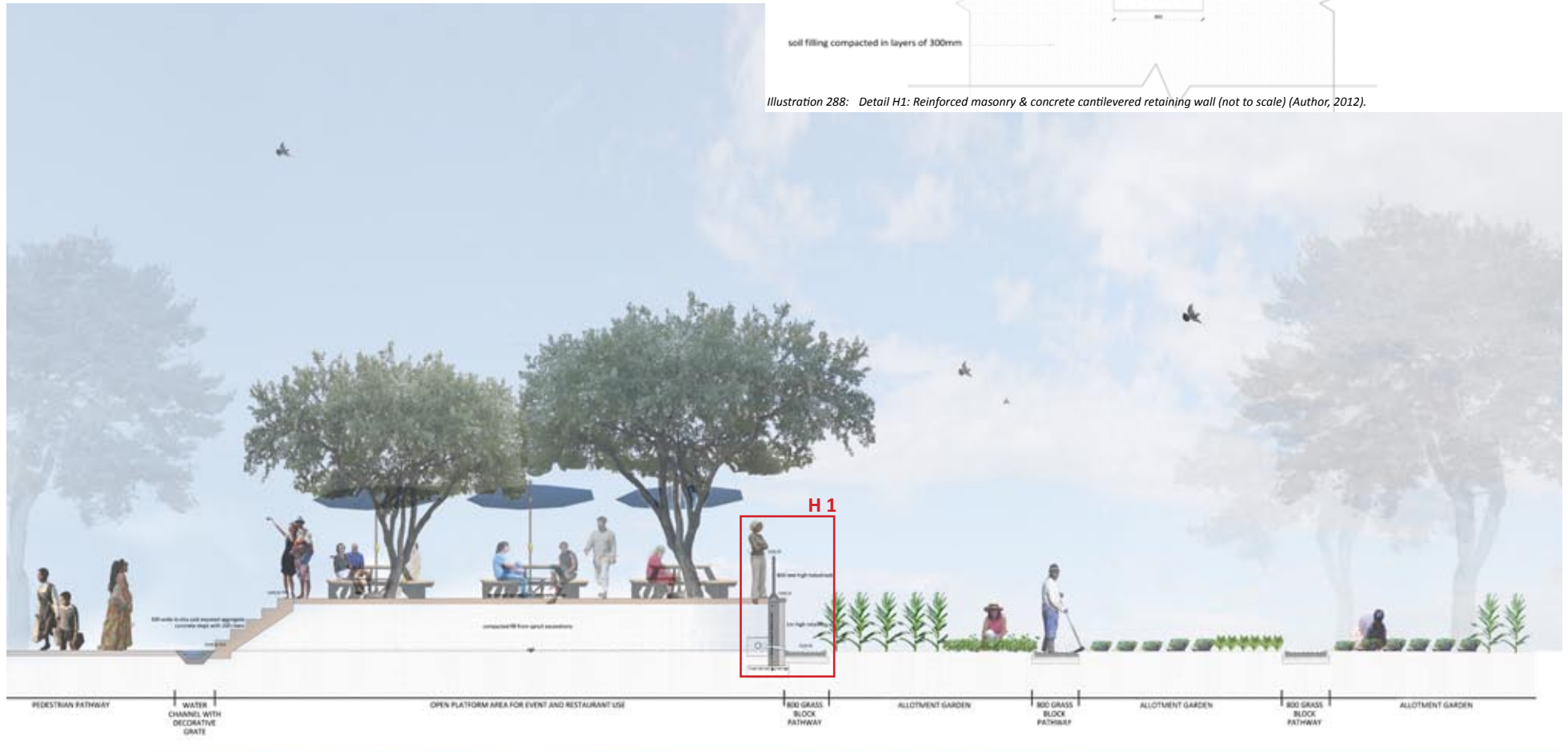


Illustration 287: Section H-H indicating the restaurant platform overlooking the allotments (not to scale) (Author, 2012).



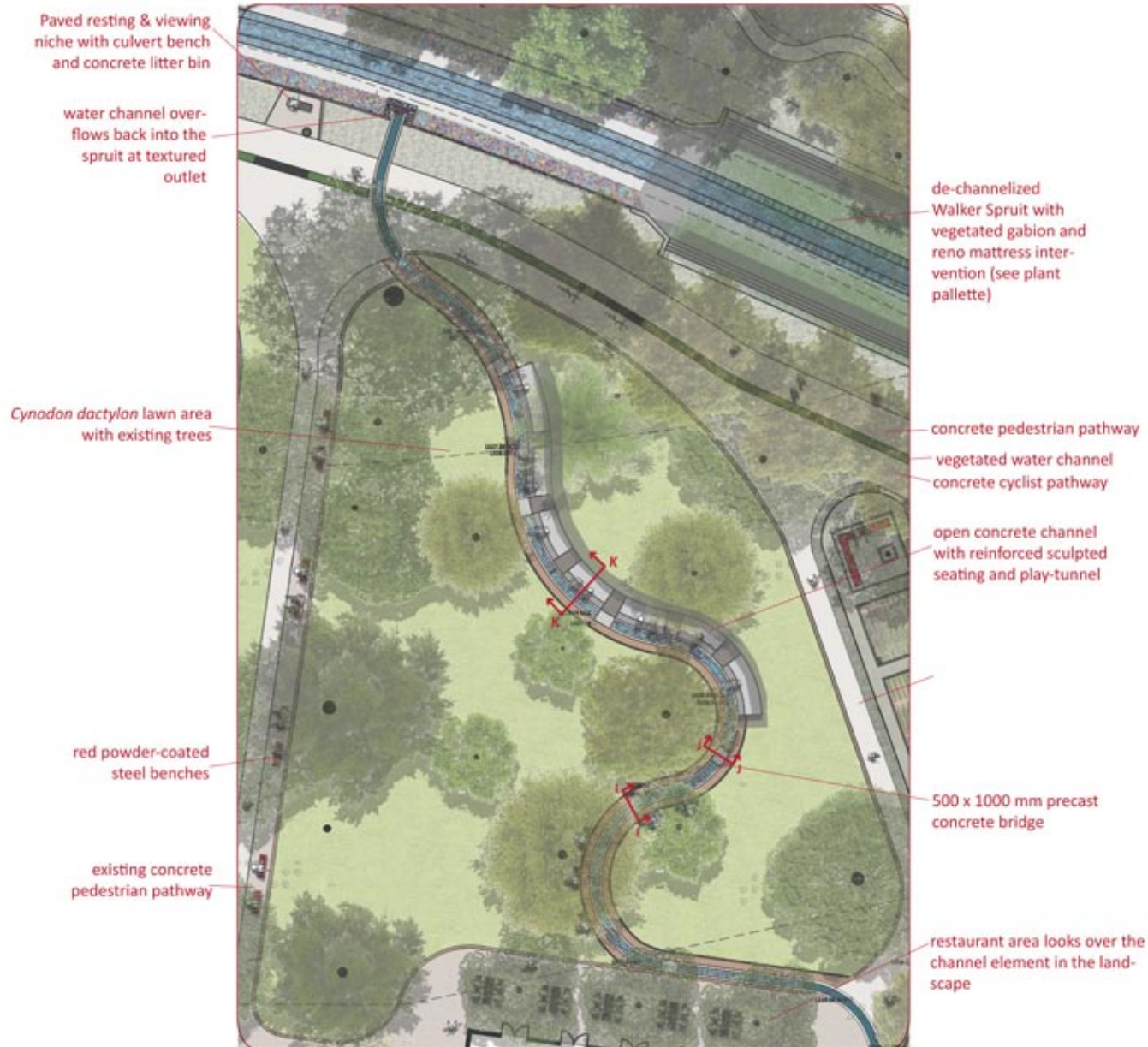


Illustration 290: Zone 5 of the sketchplan in detail (scale 1:400) (Author, 2012).



Illustration 289: Orientation of Zone 5 within the sketchplan (Author, 2012).

### Zone 5: Open lawn area with decorative channel feature

Zone Five depicts the area of the site where most of the large existing trees occur. The allotment scheme has thus been omitted here, while the trees are to be preserved and celebrated with a decorative water channel which weaves through them, paying reference to the historical irrigation channels which were once used in the area. Within the open lawn area, the shallow concrete channel will be mosaiced with recycled tiles and other found objects (*refer to previous material palette*), creating an awareness of the value of recycling. This will be executed by community volunteers and facilitated by a local artist.

Precast concrete bridges allow for the crossing of the channel, while further north the channel morphs into sculptural seating- where visitors may recline in the sun and allow their feet to be refreshed in the channel beneath. The folding form of the sculptural seating also provided the opportunity for yet another play element for children as an 'exploring play tunnel' was created.

This water element eventually flows back into the Walker Spruit, over a textured outlet at the edge of the concrete channel.

The decorative channel feature becomes not only a playful element in the landscape, but also provokes identity of place through its reference to the historic irrigation furrows that were once used in the area. As community volunteers get a chance to embellish their own public park through the mosaicing of the channel, a new layer of identity is created which simultaneously generates pride of ownership.



Illustration 291: Section I-I indicating the open concrete channel with a typical weir (not to scale) (Author, 2012).

Illustration 292: Section J-J indicating a precast concrete channel bridge (not to scale) (Author, 2012).

**CHAPTER 8: DETAIL DESIGN**

The channel morphs into a sculptural seating element, where visitors may recline and refresh their feet in the cooling water channel. Children are provided with yet another play element as a crawling tunnel is created through the back rest of the seating. The water is eventually released back onto the spruit through a decorative outlet feature.



Illustration 293: Section K-K depicting the sculptural seating and play-tunnel (not to scale) (Author, 2012).

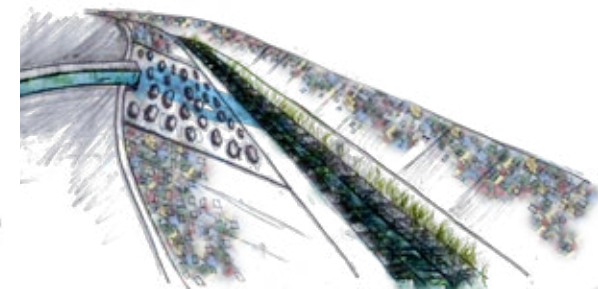


Illustration 294: Conceptual sketch of decorative channel outlet into the Walker Spruit (Author, 2012).

## CONCLUSION:

### The manifestation of the concept applied to the detailed design

This multifunctional landscape not only provides for the food security of the area, but also realizes the land's ecological, historical and social potential. The illustration below demonstrates the areas of the sketchplan where each relationship of the concept has been applied. All three Natures have been used in the detail design, manifested as elements of lines, grids and surfaces. The resultant landscape design therefore reveals all three layers of the site as past, present and future are revealed, connected and intertwined. The connecting linear elements of the site have been restored and/or inspired by their original ecological state, whilst the historical layer of the site as a farm has been revealed and paid tribute to through the provision of the allotment gardens, waterwheel and water channel. Finally, the open, social gathering and lingering spaces between these elements provide opportunities to be beautified by the community, giving a heightened sense of place and belonging to the area today and in the near future.



Illustration 295: Diagram indicating the manifestation of the concept applied to the sketchplan (Author, 2012)



# APPENDIX

Illustration 297: Pothole Garden (From: <http://www.rebelart.net/diary/pete-dungey-pothole-gardens/003828/>)

APPENDIX

APPENDIX A: CALCULATIONS

Water Budget

In order to determine whether there would be enough water in the spruit for the irrigation of the proposed allotment gardens throughout the year, the minimum baseflow of the spruit was determined during the dry season.

A cork was dropped into the spruit during the month of June, 2012 and the speed along which it was carried was recorded. Below are the findings:

1). MINIMUM BASEFLOW:

- Cork flows 10 metres in an average of 14,2 seconds. Therefore,  $10/14,2 = 0,7$  metres per second.
- On June, 8th, 2012 the water measures 2 metres wide x 0,05 metres deep =  $0,1m^2$
- Therefore,  $0,7 \times 0,1 = 0,07m^3/second$
- Therefore,  $0,07 \times 1000 = 70$  litres per second is the minimum baseflow of the Walker Spruit

2). SUPPLY PER 8 HOUR DAY:

- 8 hours x 60 minutes x 60 seconds = 28 800 seconds x  $0,07m^3$
- 28 800 seconds x  $0,07m^3 = 2016m^3$  minimum supply per 8 hour working day

3). TOTAL AREA OF ALLOTMENT PLOTS TO BE IRRIGATED:

- 28 X  $32m^2$  plots =  $256m^2$
- 17X  $16m^2$  plots =  $272m^2$
- 3 X  $14m^2$  plots =  $42m^2$

Therefore,  $570m^2$  is the total area needing irrigation

4). IRRIGATION DEMAND:

- 0,16m deep typical demand per month / 31 = 0.00516 metres deep per day
- Therefore,  $0,00516m \times 570m^2$  area = **2,94 m<sup>3</sup> demand per 8 hour day**

**THEREFORE, DEMAND < SUPPLY (0.14%)**

**THUS THE WALKER SPRUIT MAY BE USED TO IRRIGATE THE ALLOTMENT PLOTS SUSTAINABLY.**

Determining the water tank size

- Demand =  $2,94 m^3$  per day, if all taps are open (see water budget)
- Therefore,  $2,94m^3 \times 2 = 6m^3$  (precautionary)
- Therefore,  $6m^3 \times 1000 = 6000l$
- Therefore, a 6000 litre tank is required

\* required for the demands of an 8 hour day  
\* the tank is re-filled each day

- Height = 2300mm
- Diameter = 2120mm



Illustration 298: 6000 litre round galvanized steel tank (From: tankworks.com)

## Walker Spruit channel intervention calculations:

### CONCRETE CHANNEL VALUES:

- CONCRETE CHANNEL CAPACITY= 6m<sup>2</sup>  
with low base flow channel= 6.5m<sup>2</sup>
- MANNING'S n = 0.021 (concrete channel)

### CALCULATING THE NEW CROSS SECTION DIMENSIONS OF THE DE-CHANNELIZED SPRUIT WITH A RENO MATTRESS AND GABION INTERVENTION:

#### EXISTING CONDITIONS:

Flow: Q<sub>20</sub>=74m<sup>3</sup>/s (average flow for a 1:20 year storm)

Depth: 1.5m

Slope: G=D/L (height/linear distance)  
=15/723  
=0.021

#### MANNING'S n:

Reno mattress= 0.0277

0.5m gabion with stone size > 100 mm= 0.0301

Therefore, average value= 0,0289



#### INTERPOLATION USING APPLE IPHONE'S 'OPEN FLOW PRO' APP

The values above were plugged into the civil engineering application until the best and desired results of the new bioengineered channel were achieved, as indicated below:

Bottom width= 7.5 metres

Velocity=5m/s (reno and gabion capacity limit)

Top width= 10,5m

Cross-sectional area capacity= 13,5m<sup>2</sup>

### PERCENTAGE INCREASE OF CROSS SECTIONAL AREA:

Existing capacity= 6.5m<sup>2</sup>

New capacity= 13,5m<sup>2</sup>

Difference= 7m<sup>2</sup>

Therefore, 7/6.5 x 100 = 107,6%

Therefore, the channel must be enlarged by 107,6% for the installment of the bioengineered reno mattress and gabion intervention.

### DETERMINING THE RESULTANT CROSS SECTION TOGETHER WITH THE LOW BASE FLOW CHANNEL INTERVENTION:

This was determined through interpolation on CAD, as the cross sectional area capacity of 13,5m<sup>2</sup> was kept to as close as possible.

*\*REFER TO THE RESULTANT CROSS SECTIONS IN CHAPTER 9, 'DESIGN RESOLUTION' PAGE 85*

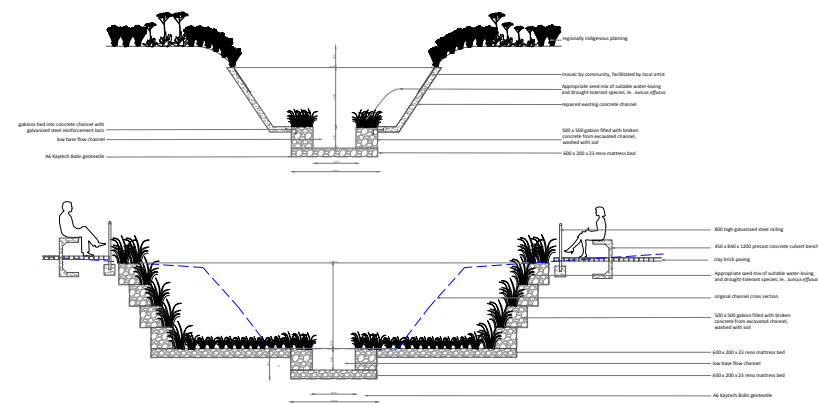


Illustration 299: Determining the new and ecologically-improved spruit cross sections (Author, 2012)

## APPENDIX B: SUSTAINABLE SITES INITIATIVE (SSI) RATING

NUMBER:	CATEGORY:	POSSIBLE POINTS/ STATUS:	ACHIEVED POINTS/ STATUS:	NOTES:
<b>1). SITE SELECTION:</b>		<b>21</b>	<b>21</b>	
PREREQUISITE 1.1	Limit development of soils designated as prime farmland, unique farmland, and farmland of statewide importance	REQUIRED	ACHIEVED	*The area's soil properties prove suitable and healthy for UA, thus the land will be conserved as designated farmland
PREREQUISITE 1.2	Protect floodplain functions	REQUIRED	ACHIEVED	* The area has been designed outside the 1:100 year floodlines
PREREQUISITE 1.3	Preserve wetlands	REQUIRED	ACHIEVED	* N/A
PREREQUISITE 1.4	Preserve threatened or endangered species and their habitats	REQUIRED	ACHIEVED	* No threatened and endangered species habitats have been identified on the site
CREDIT 1.5	Select brownfields or greyfields for redevelopment	5-10 points	10 points	* The CPUL proposal aims to regenerate these areas
CREDIT 1.6	Select sites within existing communities	6 points	6 points	* The site is located within the city fabric
CREDIT 1.7	Select sites that encourage non-motorized transportation and use of public transit	5 points	5 points	* The site is accessible to both pedestrians and cyclists.
<b>2). PRE-DESIGN ASSESSMENT AND PLANNING:</b>		<b>4</b>	<b>4</b>	
PREREQUISITE 2.1	Conduct a pre-design site assessment and explore opportunities for site sustainability	REQUIRED	ACHIEVED	* Mapping and assessment of existing site conditions has been carried through in detail.
PREREQUISITE 2.2	Use an integrated site development process	REQUIRED	ACHIEVED	
CREDIT 2.3	Engage users and other stakeholders in site design	4 points	ACHIEVED	* The Clydesdale and Sunnyside East community groups are to be intimately involved in the design process
<b>3). SITE DESIGN- WATER:</b>		<b>44</b>	<b>44</b>	
PREREQUISITE 3.1	Reduce potable water use for landscape irrigation by 50 percent from established baselines	REQUIRED	ACHIEVED	* No potable water will be utilized for irrigation.
CREDIT 3.2	Reduce potable water use for landscape irrigation by 75 percent or more from established baseline	2-5 points	5 points	
CREDIT 3.3	Protect and restore riparian, wetland, and shoreline buffers	3-8 points	8 points	
CREDIT 3.4	Rehabilitate lost streams, wetlands, and shorelines	2-5 points	5 points	* The channelized spruit will be ecologically-restored where possible
CREDIT 3.5	Manage stormwater on site	5-10 points	10 points	* Stormwater will be managed via the use of bioswales and pathways acting as channels, leading water back into the spruit
CREDIT 3.6	Protect and enhance on-site water resources and receiving water quality	3-9 points	9 points	* Only permaculture will be permitted as the farming method within the allotments
CREDIT 3.7	Design rainwater/stormwater features to provide a landscape amenity	1-3 points	3 points	* The waterwheel is a sculptural and educational element within the design
CREDIT 3.8	Maintain water features to conserve water and other resources	1-4 points	4 points	* The decorative channel directs excess water back into the spruit



4). SITE DESIGN- SOIL & VEGETATION:		51	39	
PREREQUISITE 4.1	Control and manage known invasive plants found on site	REQUIRED	ACHIEVED	* Alien species such as the <i>Tipuana tipu</i> will be removed if applicable and used as wood for children's play equipment
PREREQUISITE 4.2	Use appropriate, non-invasive plants	REQUIRED	ACHIEVED	* Endemic plants are proposed for the planting palette
PREREQUISITE 4.3	Create a soil management plan	REQUIRED	NOT YET ACHIEVED	* A Soil Management Plan will be developed and communicated to construction contractors prior to construction to limit disturbance and define the location and boundaries of all vegetation and soil protection zones.
CREDIT 4.4	Minimize soil disturbance in design and construction	6 points	6 points	* All areas of healthy soils (proposed planting areas) will be protected during site construction in order to limit compaction in the constructed area.
CREDIT 4.5	Preserve all vegetation designated as special status	5 points	5 points	* The historic <i>Phoenix canariensis</i> palm will be preserved and celebrated on site
CREDIT 4.6	Preserve or restore appropriate plant biomass on site	3-8 points	8 points	* Riparian species have been proposed to be preserved and restored to a level appropriate to the site's region. Allotment plots have been proposed consisting of conventional intensive crop species for urban agriculture. Plant biomass therefore covers 80 % of the site. What's more, regionally appropriate species that support ecosystem service benefits have been proposed along the length of the spruit.
CREDIT 4.7	Use native plants	1-4 points	4 points	* Only endemic species are in the proposed plant palette
CREDIT 4.8	Preserve plant communities native to the ecoregion	2-6 points	3 points	
CREDIT 4.9	Restore plant communities native to the ecoregion	1-5 points	5 points	
CREDIT 4.10	Use vegetation to minimize building heating requirements	2-4 points	N/A	* Buildings with mechanical heating requirements will not be utilized in the area.
CREDIT 4.11	Use vegetation to minimize building cooling requirements	2-5 points	NOT YET ACHIEVED	* Detail architectural design is yet to be resolved
CREDIT 4.12	Reduce urban heat island effects	3-5 points	5 points	* Extensive tree canopy cover is proposed in the detail design.
CREDIT 4.13	Reduce the risk of catastrophic wildfire	3 points	3 points	The site is as hardy and accessible as possible
5). SITE DESIGN- MATERIALS SELECTION:		36	32	
PREREQUISITE 5.1	Eliminate the use of wood from threatened tree species	REQUIRED	ACHIEVED	
CREDIT 5.2	Maintain on-site structures, hardscape, and landscape amenities	1-4 points	4 points	
CREDIT 5.3	Design for deconstruction and disassembly	1-3 points	3 points	* The concrete channel will be broken up and re-used to fill the ecological gabion and reno mat intervention
CREDIT 5.4	Reuse salvaged materials and plants	2-4 points	NOT YET ACHIEVED	* Detail design is yet to be resolved.
CREDIT 5.5	Use recycled content materials	2-4 points	4 points	* The concrete channel will be broken up and re-used to fill the ecological gabion and reno mat intervention. The decorative channel is to be mosaiced with appropriate recycled elements. A recycling station is proposed in the masterplan.
CREDIT 5.6	Use certified wood	1-4 points	4 points	
CREDIT 5.7	Use regional materials	2-6 points	6 points	
CREDIT 5.8	Use adhesives, sealants, paints, and coatings with reduced VOC emissions	2 points	2 points	
CREDIT 5.9	Support sustainable practices in plant production	3 points	3 points	
CREDIT 5.10	Support sustainable practices in materials manufacturing	3-6 points	6 points	

**APPENDIX**

<b>6). SITE DESIGN- HUMAN HEALTH &amp; WELL-BEING:</b>		<b>32</b>	<b>32</b>	
CREDIT 6.1	Promote equitable site development	1-3 points	3 points	* Provision of opportunities for job employment during construction can be granted to local, low-income individuals, locally owned and operated
CREDIT 6.2	Promote equitable site use	1-4 points	4 points	* The entire design will serve as a desirable amenity that was identified as a community need, through the implementation of farmer's markets and community gardens, along with recreational facilities.
CREDIT 6.3	Promote sustainability awareness and education	2-4 points	4 points	* The precinct will serve to educate the community in food security. Community centres and demonstration areas have been proposed.
CREDIT 6.4	Protect and maintain unique cultural and historical places	2-4 points	4 points	* No cultural and historical locations, attributes and artifacts have been identified on site.
CREDIT 6.5	Provide for optimum site accessibility, safety, and wayfinding	3 points	3 points	* Site use has been promoted by increasing the user's ability to understand and safely access the outdoor space by means of natural surveillance with lighting, entrances and walkways, visibility and sight lines.
CREDIT 6.6	Provide opportunities for outdoor physical activity	4-5 points	5 points	* The entire site promotes outdoor activity. Cycling pathways, a riverwalk, complete with lighted pathways and resting spaces have been designed along with orchards, allotment gardens and playgrounds.
CREDIT 6.7	Provide views of vegetation and quiet outdoor spaces for mental restoration	3-4 points	4 points	* This has been provided within the proposed 'urban forest' and 'resting and viewing niches' along the length of the spruit
CREDIT 6.8	Provide outdoor spaces for social interaction	3 points	3 points	* The entire design provides for this opportunity in its proposal for allotment plots, community centres and its recreational conservation space in the broader scope. Designated 'outdoor gathering spaces of various sizes and orientations to accommodate groups', for the purpose of building community and improving social ties has been one of the main focuses of the masterplan.
CREDIT 6.9	Reduce light pollution	2 points	2 points	* All exterior lighting will be designed so that all site and building mounted luminaires produce a maximum initial illuminance value no greater than 0.01 horizontal and vertical foot-candles at the site boundary and beyond.
<b>7). CONSTRUCTION:</b>		<b>21</b>	<b>8</b>	
PREREQUISITE 7.1	Control and retain construction pollutants	REQUIRED	NOT YET ACHIEVED	* Discharge of construction site pollutants and materials will be prevented and minimized to protect receiving waters (including surface water, groundwater, and combined sewers or stormwater systems), air quality, and public safety.
PREREQUISITE 7.2	Restore soils disturbed during construction	REQUIRED	NOT YET ACHIEVED	* Soils disturbed during construction in all areas that will be re-vegetated (all areas that will not be built upon) will be restored to rebuild the soils' ability to support healthy crops, biological communities, water storage and infiltration.
PREREQUISITE 7.3	Restore soils disturbed by previous development	REQUIRED	N/A	* Restoring the soil function in areas of previously disturbed topsoils and subsoils to rebuild the site's ability to support healthy plants, biological communities, water storage, and infiltration is not necessary in this greenfield site.
CREDIT 7.4	Divert construction and demolition materials from disposal	3-5 points	5 points	* The broken concrete from the dechannelization of the spruit will be re-used to fill the gabions for the bioengineered, ecological spruit intervention proposed
CREDIT 7.6	Minimize generation of greenhouse gas emissions and exposure to localized air pollutants during construction	1-3 points	3 points	* One will aim to use construction equipment that reduces emissions of localized air pollutants and greenhouse gas emissions.

8). OPERATIONS & MAINTENANCE:		23	12		
PREREQUISITE 8.1	Plan for sustainable site maintenance	REQUIRED	ACHIEVED	* A site maintenance plan will be developed that outlines the long-term strategies and identifies short-term actions to achieve sustainable maintenance goals.	
PREREQUISITE 8.2	Provide for storage and collection of recyclables	REQUIRED	ACHIEVED	* Composting areas have been proposed adjacent to each planting area in the detail design. Furthermore, a recycling centre has been proposed in the masterplan.	
CREDIT 8.3	Recycle organic matter generated during site operations and maintenance	2-6 points	6 points	* Composting areas have been proposed adjacent to each planting area throughout the development framework, therefore cropwaste will be utilized to generate compost and mulch to support nutrient cycling, improving soil health and reducing transportation costs and materials going to landfills.	
CREDIT 8.4	Reduce outdoor energy consumption for all landscape and exterior operations	1-4 points	2 points	* Energy-efficient solar street lighting has been proposed to reduce energy consumption and costs. Detail design has not yet taken forth hence is cannot yet be calculated if 'baseline energy use is that of the lowest-cost comparable item' as yet.	
CREDIT 8.5	Use renewable sources for landscape electricity needs	2-3 points	NOT YET ACHIEVED	* Detail design is yet to be resolved.	
CREDIT 8.6	Minimize exposure to environmental tobacco smoke	1-2 points	N/A	* Does not apply	
CREDIT 8.7	Minimize generation of greenhouse gases and exposure to localized air pollutants during landscape maintenance activities	1-4 points	4 points	* Reduce, avoid, or eliminate the use of landscape maintenance equipment that exposes site and adjacent building users to localized air pollutants and generates greenhouse gas emissions.	
CREDIT 8.8	Reduce emissions and promote the use of fuel-efficient vehicles	4 points	NOT YET ACHIEVED	* Promote the use of vehicles that have reduced emissions and/or high fuel efficiency to reduce pollution and land development impacts from automobile use.	
9). MONITORING & INNOVATION:		18	18		
CREDIT 9.1	Monitor performance of sustainable design practices	10 points	10 points	* The design is proposed to be monitored and documented by the nearby agricultural dept to evaluate their performance over time and improve the body	
CREDIT 9.2	Innovation in site design	8 points	8 points	* To encourage and reward innovative sustainable practices for exceptional performance above requirements and/or innovative performance in sustainable sites categories not specifically addressed by the Sustainable Sites Initiative Guidelines and Performance Benchmarks.	
<b>TOTAL:</b>		<b>FOUR STARS</b>	<b>250</b>	<b>210</b>	<b>84 % OF TOTAL POINTS</b>



## APPENDIX C: PRELIMINARY COMMENTS FROM EXAMINER

(Annamari Comrie of GREENinc Landscape Architects)

### Introduction & Theory

- Creative title. I liked the images you used at the start of each chapter. They have a sense of humour and gives continuity to the entire dissertation.
- Every section under the Background and Context is written in a clear and concise way and is easy to understand.
- The quotes and images used to support the Theory chapter are well chosen and add interest.
- The theory chapter is easy to follow, as each section has its own introduction and summary. This way of structuring the chapter is very successful as it ensures that a reader with no prior knowledge of the scheme does not get 'lost' in all the information.
- The summary of each 'Part', the overall Conclusion, the Design Manifesto and the Synthesis of the Investigation, has convinced me of the relevance of the theoretical investigation and that it will form a solid base to your subsequent master-plan and detail design.

### Context & Site Analysis

- The site analysis seems complete, but I think a 3D block model of your figure-ground study (illustration 89) would have given the reader a sense of space and scale. I know that illustration 90 gives a bird's eye view of the area, but it is too small to be of value. A 3D model would have been valuable in the spatial exploration of the master-plan areas as well as the detail design.

### Precedents

- If you have time, go and look at this restaurant and nursery situated in a park in Amsterdam. <http://www.restaurantdekas.nl/> You may find it inspirational!

### Framework

- I struggled a bit with the framework chapter, as the illustration numbers do not always correspond with those in the text.
- The Framework validates the scheme as it confirms that the park could be extended and integrated (as a CPUL) into not only in the surrounding neighbourhoods, but also into the greater region. (If you looked further than Tshwane, I'm sure you could have gone as far as the Braamfontein Spruit in Johannesburg!)

### Design Development

- The synthesis of the theories of line, grid and surface, with the three 'natures', is a very academic, though interesting approach to the design.
- Design development and the exploration of different ideas are evident, but I would have liked to see more 3 dimensional explorations of spaces and relationships.

### Detail Design

- It appears as if you have successfully incorporated the 3 'natures' of your concept into the master- and sketch-plan designs.
- On the master-plan, the motivation behind the choice & location of the following activities need further explanation:
  - o Nursery
  - o Restaurant catering for the offices in Clydesdale
  - o Hawker's stands
  - o Canteen for school children
- I would have liked to see more on the architecture of the buildings, as you have the opportunity (which in real life you seldom have) to make them a part of your overall philosophy and design thinking.

### At the final presentation, I would like to hear & see the following:

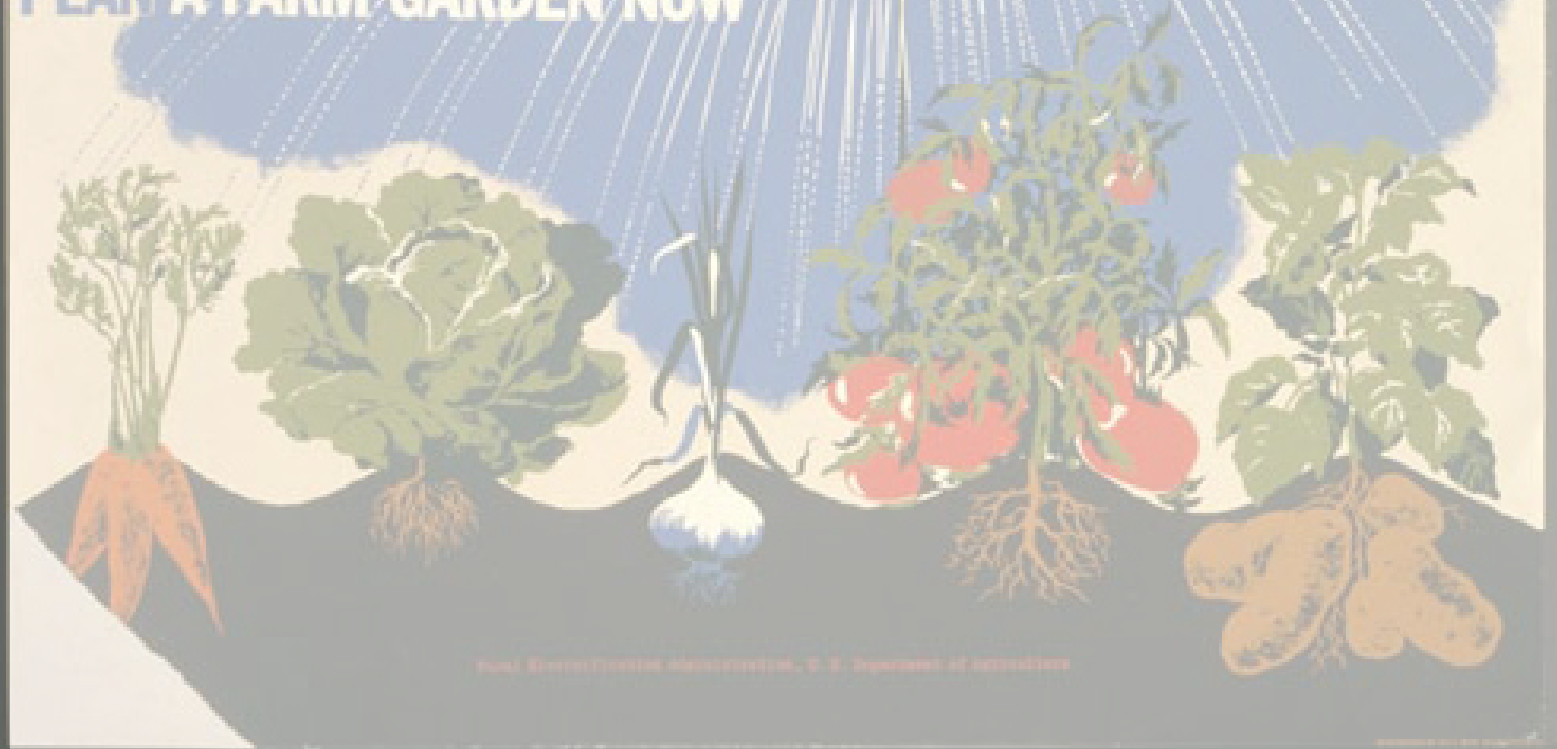
- An explanation of the programming of your site - Why did you decide on the functions (like a restaurant, canteen, nursery etc) and what determined their location on site?
- Rendered master-plan & sketch-plan
- Perspectives or collages that will give me a sense of place and a feeling for the design language of your scheme.
- Perspectives or a 3d model that will give me a sense of scale and space.

### In conclusion:

I enjoyed reading your dissertation and I look forward to the final presentation. I think you have successfully asked and answered the questions that were expected of you. I do however think that the thinking behind your actual physical design needs more explanation. Now it is up to you to present your design in such a way as to convince me that it could become a reality.

GROW IT YOURSELF

PLAN A FARM GARDEN NOW



10

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