Germinate

Architecture of Growth

A mixed-use development in Salvokop

Karl-Robert Gloeck

MArch(Prof) UP 2011
Germinate: Architecture of Growth

A mixed-use housing development in Salvokop to stimulate physical and social growth in a disconnected area

by Karl-Robert Gloeck

Submitted in partial fulfilment of the requirements for the degree Master of Architecture (Professional) Department of Architecture, Faculty of Engineering, Built Environment and Information Technology, University of Pretoria

Study leader: Gary White
Course coordinator: Jacques Laubscher

Pretoria
2011
for Tasha

Romans 5:3-5a

And not only this, but we also exult in our tribulations, knowing that tribulation brings about perseverance and perseverance, proven character; and proven character, hope and hope does not disappoint...
In accordance with Regulation 4(e) of the General Regulations (G.57) for dissertations and theses, I declare that this dissertation, which I hereby submit for the degree Master of Architecture (Professional) at the University of Pretoria, is my own work and has not previously been submitted by me for a degree at this or any other tertiary institution.

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

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

______________________________
Karl-Robert Gloeck
Germinate: Architecture of Growth, a mixed use development in Salvokop

Project summary
A mixed-use housing development in Salvokop to stimulate physical and social growth in a disconnected area

Programme:
Mixed-use housing development

Site description:
Gateway into Salvokop, activating the existing pedestrian route

Client:
Mixed client, primarily Yeast City Housing

Users:
Students and facilitators of the Department of the Built Environment, the built environment industry and the general public

Site Location:
Erf R/406, Salvokop

Address:
oc/o Skitepoort Avenue and Koch Street, Salvokop, Pretoria, South Africa

GPS Coordinates:
25°45'36"S, 28°11'13"E

Architectural Approach:
A process-focused approach whereby guidelines are developed, validated and, along with practical influences, used to substantiate the architectural product

Research filed:
Urbanism and human settlements
Problem & Response

Problem Statement
Hierarchy of Challenges
Proposal
Summary of Theories
Discussion

Framework
The Bigger Picture
Problem Statement
Vision & Parti
Connect & Preserve
Analysis of existing frameworks

Precedents & Testing
TAU Village - Pretoria
Joe Slovo Precinct (N2 Gateway project) - Cape Town
Brickfields - Johannesburg
34 Lower Terrace - Pretoria
Mieres Social Housing - Spain
Abstract

The core idea of the thesis (Germinate: Architecture of Growth) provides the creative impetus, and along with the site, the program (or function), and the client, act as a set of catalysts for the arrival at the architectural product.

The product presents the practical element of the suggested solution, and concludes the exploration of the housing and wider land-use options with the proposal of a mixed-use development to create a relevant intervention in the suburb of Salvokop.

This arrival at the product is justified by guidelines developed as a response to the pressing issues of urbanisation, environmental sustainability, and the need for housing. In addition, a development framework for the entire area of Salvokop is proposed together with supporting analysis which also contributes to the establishment of these guidelines. Existing local and international theories are considered in order to strengthen the foundation of the argument as is appropriate for this level of post-graduate study.

Once the guidelines are established they are individually tested against a variety of existing local and international precedents. This testing validates the inclusion of each guideline in the entire process, thus justifying their application to the design.
Figure 0.1 Sketch illustrating the design process
Germinate - Architecture of Growth

Process (chapter)

Background
Urbanisation
Sustainability
Housing in SA
History of Salvokop
Aerial History

Framework
Connect and Preserve
Phases 1, 2 & 3

Analysis
Pedestrian Movement
Vertical surfaces
Vehicular Movement
Existing Conditions

Research & proposal
Theory
Habraken - Supports
Lewis - Front to Back
Hamdi - Small Change
Brand - How buildings
Learn

Local documents
Faster, Harder,
Smarter
Breaking New Ground
Green Paper on
Climate change

Guidelines
1. Located in a functional
environment
2. Medium to high density
3. Balanced mixed-use
environment
4. Part of a long-term plan
5. Address the immediate
needs of locals/residents
6. Facilitate the formation of
communities
7. Appropriate & responsive
pedestrian scale

Precedents/testing
International
Mieres Social Housing
Hebertus House
Linked Hybrid
Duren Residential
Complex
Niewmarkt
Simmons Hall
Grenoble

Local
TAU Village
N2 Gateway project
Brickfields
Germinate
Architecture of Growth

(6) Site
2:3 Ratio
Existing buildings
Existing activities

(6) Program
Short-term housing
Permanent rental housing
Social facilities
Retail
Public space

(6) Client
Mixed client
YEAST City Housing

Figure 0.2 Diagram explaining the process of design
“South Africa’s cities still reflect an apartheid geography and are low density in nature with the poorest communities tending to live far away from services and employment. This contributes to increased transport emissions.”

(South Africa, 2010: 26)
Introduction

The Urbanisation Agenda
The Sustainability Agenda
Definition and History of Social Housing in South Africa

Identifying the challenges faced in the modern built environment, specifically in South Africa, focusing on the situation of human settlements and the need thereof.
The Urbanisation Agenda

According to international statistics in “Population Challenges and Development Goals”, a document compiled by the United Nations (UN, 2005: 10), the next 20 years will see the global process of urbanisation at its most intensive in developing regions across the world.

Although the more developed European and North American countries currently have a higher percentage of their population residing in urban settings, cities in developing countries are still experiencing a considerable growth rate. Whilst the year 2007 marked the point, on a global scale, where the number of urban dwellers surpassed the number of rural inhabitants, this same point will only be achieved for developing regions in 2017. Between 2005 and 2030 an increase of 1.7 billion people has been predicted for urban areas in developing countries. (UN, 2005: 10)

Local and internationally sourced statistics clearly indicate the dramatic migration of population from rural to urban areas in South Africa (South Africa, 2010: 25), (Human Sciences Research Council, 1996). The process of urbanisation has accelerated particularly since the 1990’s, a trend which can be directly attributed to the abolishment of Apartheid and in particular the related Group Areas Act. (South Africa, 2010: 27)

This extensive influx of people into the greater urban areas requires an appropriate response from an urban and architectural planning perspective: a response which provides inhabitants with comfortable, liveable environments, whilst responding appropriately to the pressures of increased population density on the urban fabric.

The Green Paper on Climate Change published by the Department of Environmental Affairs in 2010 emphasises the impact of the intensified process of urbanisation occurring in South Africa. Metropolitan areas have the highest rate of expansion and secondary cities are experiencing the second highest growth rate. This growth takes place at the expense of the population of rural areas. Currently 62% of South Africa’s population is estimated to be living in urban areas. (South Africa, 2010: 25)

Even while trying to create sustainable urban settlements, the effects of this rapidly expanding urban population are often more concealed than apparent, unlike the case of their rural counterparts. Although the delivery of services to inhabitants is a more viable and cost-effective pursuit in the denser urban areas, these communities have a more extensive, usually negative impact on their environments than their rural counterparts. This impact stretches well beyond the municipal boundaries. (South Africa, 2010: 25)
Figure 1.1 Five yearly incremental graph showing the percent of South Africa’s urbanised population.
The Sustainability agenda

South Africa’s main contribution to the process of climate change is through the depletion of non-renewable energy sources. South Africa contributes 41.9% of the African continent’s CO2 emissions. This is due largely to the rich deposits of coal in the country which are used to produce electricity for local consumption and for a number of other Southern African countries. (du Plessis et al, 2003: 244)

It is the author’s opinion that the sensitive planning and managing of urban realms is fundamental to creating a balanced and liveable city. However establishments which often claim to be “Green” or “sustainable” are often located far from existing services and infrastructure (a “non-green” set of circumstances in themselves). This developmental pattern contributes to the disintegration of South African cities by encouraging urban sprawl. According to Tonkin (2008: 19) these Greenfield sites offer the opportunity for the establishment of comfortable, low density homes. These superficial benefits are however considerably outweighed by the negative effects which these developments have on the supporting infrastructure.

The manner in which the current Government has delivered subsidised housing on the urban periphery has also exacerbated the problem of urban sprawl. The continuing implementation of the Apartheid city model (Figure 1.2) ensures transportation difficulties with the majority of residents living on the periphery but working in the (distant) city and it’s supporting industrial regions. (du Plessis, 2003: 243)

The decentralisation that occurs, as a result of the increase in established periphery communities, including gated communities, is the chief contributor to the otherwise avoidable increase in consumption of fossil fuels due to energy required for transport. This urban sprawl creates a low density residential environment that not only inhibits infrastructure development, but also discourages small-scale economic activities because the minimum threshold population required to support them is too dispersed. This leaves local enterprises unable to compete with larger, more globalised operations, housed in regional shopping malls and department stores. Activities also become isolated as large plots becoming single-use, further promoting the notions of shopping malls and mono-functional landscapes. This is ultimately an inconvenience for the inhabitants of the peri-urban areas as daily tasks can no longer be completed without the use of private transport, a luxury beyond the reaches of a large majority of city dwellers. This pedestrian-unfriendly environment is often too widely dispersed for it to be even rudimentarily covered even by public transport. (Tonkin, 2008: 19)
This situation effectively alienates the poorer members of society and promotes segregation in its most class-specific form. Although this is a quiet hope for developers of gated communities, the process is exacerbating the ever-increasing divide between rich and poor.

As concerns for the environment increase and as awareness of the “triple-bottom line” increases in all spheres of development, urban sprawl finds itself out-dated and inappropriate, despite still being the easiest short-term solution to the challenges of urbanisation (Tonkin, 2008: 20).

Increasing density through the provision of medium- to high-density housing is currently the most popular trend internationally. Should this approach be applied locally it could contribute substantially to the reversing of the degenerative and dangerous trend of urban sprawl. (du Plessis, 2003: 250)

A variety of suitable housing opportunities needs to be provided in areas that are close to work opportunities, schools and other public amenities. This can stimulate the growth of a more pedestrian-friendly environment with centralised services and a more concentrated and cost-effective infrastructure.

Figure 1.2 Apartheid city structure by M.Napier (2005)
Definition and History of Social Housing in South Africa

Definition
Social Housing in South Africa is housing which is usually delivered and managed by a non-profit social housing institute and spans a variety of accommodation types from transitional to temporary and permanent. Housing units are rented out, maintained and managed by the owning social housing institute. Government involvement includes financial support (with subsidies for the initial capital expenditure as well as for rental), and incentives in the form of reduced tariffs, fast-tracked approval and financial guarantees to encourage the private sector players to deliver these types of initiatives. (SHIFT 20010: 2)

History
Although social housing in South Africa has only been part of governmental vision since 1998 it has evolved dramatically in the relatively short time, particularly when comparing it to international examples in Europe and elsewhere, where the delivery of social housing has been a “work in progress” for over 100 years. (SHIFT 2010: 1)

1995
The first institutional subsidies are awarded. Government subsidies are paid to institutions providing rental (or rent to buy) housing to households earning less than R3500 a month, in order to recover costs not supported by decreased rental.

1996
The National Housing Finance Corporation (NHFC) is established. The purpose of NHFC is to manage the distribution of subsidies and development of various social housing institutes.
1997
The Housing Act (No 107 of 1997) is implemented
This replaces all previous legislation as it defines the roles of the various spheres of government and sets out principles for housing delivery.

Social Housing Foundation founded
Established by the NHFC to facilitate the delivery of sustainable houses.

1999
The Rental Housing Act (No 50 of 1999) is implemented
This further defines the role of government as well as expectations of tenants and landlords to ensure the proper functions of the rental housing process.

2003
The Social Housing Policy of South Africa is proposed
This policy acts as a framework for the establishment of a funding regime for potential housing institutions, a policy which is later amended and then approved in 2005.

“Breaking New Ground” (BNG) is released
After almost nine years the Minister of Human Settlements (then Housing) releases the new policy which amongst other things drastically redirects the housing delivery from a product based to a process based system

2004
The Social Housing Act (No 16 of 2008) implemented
The latest act further defines the roles of national, local and provincial government in promoting a social housing environment whilst also establishing a regulatory authority to accredit social housing institutions before they receive government funding

2008
Adapted from “History of Social Housing Internationally and in South Africa” by the Social Housing Foundation” (2010: 6-11)
Dissertation Objectives

The aims of this dissertation are by nature firstly Architectural, then focussed towards the challenges of Housing, to South Africa, Sustainability and then finally Community.
Setting the scene and defining the context and situation of the dissertation. Historical and visual contributors and informants of the design and proposal are established. Relevant analyses and statistics are also revealed.
51% of Sub-Saharan Africans are forced to survive on less than $1.25 a day. (Hunger Notes, 2011)

Approximately 18% of South African adults have contracted the HIV/AIDS infection with 29% of pregnant women estimated to have the virus. (African AIDS, 2011)

Recent crime stats show that 50% of South Africa’s crime occurs in Gauteng, making it (South African Government information, 2011)
The disconnectedness of Salvokop is evident by the lack of recent development and is further discussed in chapter 4.

Figure 2.1-5: Maps of various scales
Figure 2.6: Figure ground map of Pretoria

Tshwane → Pretoria → Salvokop
Salvokop is located in the south-western quadrant of Pretoria, on the southern side of the railway line. The area where Salvokop is located was originally inhabited by the Ndebele people and came to be known as the Transvaal where in 1855 Pretoria was proclaimed as the capital. Development was centred around Market square, spreading to the east and west as north/south development was restricted by the Magaliesberge to the north and Bronberge to the south.

During the First Anglo-Boer War in 1880 the site of Salvokop was known as Time Ball Hill from which the delivery of different types of mail could be signalled to interested citizens in the town. It was in 1886 however, only after the discovery of the main gold reef on the Witwatersrand, that there were enough funds to establish a railway line. With the building of a station being proposed between Market Square and Time-ball Hill. The Nederlandsche Zuid-Afrikaansche Spoornetwerk (NZASM) was established the following year and commissioned the majority of development in the area, including the first station buildings (Illustration 2.7). (de Jong, 2003: 4)

During the New Year’s weekend of 1895-6 the Jameson Raid took place south of Pretoria, as the British Colonies attempted to take control of The Zuid-Afrikaansche Republiek (ZAR) which had taken control of NZASM. The outcome of these actions severely compromised British-ZAR relations, eventually leading to the Second Anglo-Boer War of 1899 - 1902, during which time the central workshops of Salvokop were used for cannon maintenance and ammunition production. (de Jong, 2003: 6)

After the war ended in 1902, focus returned to providing a national rail network and NZASM was reinvented as the Central South African Railways (CSAR). As a consequence of this economic activity a residential suburb was established in Salvokop through the construction of a workers compound and a “whites only” railway camp in 1904 (Illustrations 2.8&2.10). (de Jong, 2003: 7)

In 1910 the Union of South Africa was formed and the Cape and Natal railway administrations merged with the CSAR to form the South African Railways and Harbours Administration (SAR & HJ). That same year the corner-stone for the new railway station (Illustration 2.9), designed by Herbert Baker, was laid, marking the beginning of an era of development in the area. (de Jong, 2003: 8)

In 1921, after a number of audits and reports had been submitted to the Union government concerning the inadequate state of housing in the area for railway workers, a new typology of accommodation was developed, allowing residents to construct their own dwellings within a set of predefined guidelines. (de Jong, 2003: 8)

After the general elections of 1948 the legal policy of racial segregation,
Illustration 2.7: The station building with Time-Ball hill in the background to the left

Illustration 2.8: The first NZASM houses with the station in the background

Illustration 2.9: Aerial view of the new Pretoria Railway Station

Illustration 2.10: The row-houses of the "White" railway camp
known later as Apartheid, was introduced. This resulted in the relocation of all non-white residents of Salvokop, mostly to the township of Mamelodi, approximately 20km away. During the 1960s the last new houses were built in the area, and in 1975 the Minister of Transport approved the upgrading of Salvokop, which resulted in many of the houses being renovated and restored. Only three years later the semi-detached row houses that characterised the centre of the suburb were demolished and the resultant empty site was left undeveloped for over 35 years. (de Jong, 2003: 9)

After President FW de Klerk became State President in 1990 negotiations to end Apartheid and its legislative restrictions began. Soon many black workers began to return to Salvokop, significantly increasing the levels of activity in the area. In 2001 angry commuters set fire to Pretoria Station, significantly damaging the roof of the structure (Illustration 2.13). The following year repair work to the station roof commenced. At the same time, the area of Salvokop once again became the focus of development, as Freedom Park was proposed on top of the hill, overlooking the residential suburb which was ear-marked for the re-establishment of an urban precinct. (de Jong, 2003: 10)

Six years after the Pretoria Station fire the line for the newly operational high-speed rail service, the Gautrain, was proposed to run through Salvokop. The proposal was later rejected due to heritage and environmental reasons. With the area still part of an urban regeneration scheme at least one extra vehicular access road was also proposed into Salvokop, from the north-east to create better accessibility to the suburb.

In 2008 Intersite (the property owning and management arm of the previous administration’s SAR&H) proposed an iconic new transport terminal (Illustration 2.12) which would include a Station Deck, Gautrain station, Bus Rapid Transport station, taxi and bus stop as well as shopping and parking, and would greatly increase accessibility to and from Salvokop.

Despite the radical proposals to regenerate the area little has come to fruition, with most frameworks never advancing past the proposal phase, due possibly to their “blanket” nature, treating seemingly similar areas with a generic solution. Considering the slow pace of development over the last two decades it would appear that this area would probably not benefit from extensive sudden development, but instead a slowly expanding progression of local activities focussed on the creation and growth of community would appear to be more appropriate. A nodular development along the intersection of important circulation axes, as proposed in this document, could encourage development in the precinct, as members of the community begin to take ownership of their surroundings, thus creating a positive environment for living and working.
Figure 2.11: The Proposed GAPP framework for Salvokop with author’s site highlighted, 2003

Illustration 2.12: The proposed Intersite Terminal with Salvokop in the left foreground, 2008

Illustration 2.13: The Pretoria Station shortly after the blaze that destroyed the roof in 2001
Aerial history of Salvokop

Earliest records show the fine residential grain that Salvokop still exhibits in the present day. The maintenance yard north of the suburb is still fully operational.

Pedestrian paths in the south become more pronounced as the suburb is steadily growing.

Additional housing is established in the south-eastern corner of the suburb as more of the area is cleared for development.

Drastic changes to the area are seen due mostly to the large jump in time. The extent of the maintenance yard was reduced severely and the light industrial zone has all but disappeared. The row houses in Salvokop have been demolished and the station has been upgraded.

Maps

The light industrial zone is now a forgotten landscape with the old Chief Engineers office (now social upliftment project, POP-UP building) the final functioning remnant of the previous era. Vacant sites within the residential area are used extensively as short-cuts with movements paths clearly visible.

The construction of Freedom Park in the south prompts development in the suburb along the main entrance road to the Park. Pedestrian movements have turned vacant sites into wastelands.

The vacant land in the north of Salvokop deteriorates rapidly as scars in the landscape begin to form.

Parking lots for Metro-rail users are implemented on vacant sites as Freedom Park expands, proposing a new main entrance to the east of the existing entrance to protect the frail nature of the suburb.

2009 Aerial photo Site

Location of:
- Photo
- Panorama
- Horizontal texture
- Site boundary
- Fence line of new parking lot

Figure 2.22: Site map

Germinate - Architecture of Growth
Routes intended for vehicular transport

Underutilised

Informal traders

Unaccommodated

Over accommodated

Parking lot for metrorail users

Routes intended for pedestrians

Underutilised

Overutilised

Illustrations 2.23-30: Site photos by Author
Site Analysis

Site as seen from Koch Street

Panorama

Illustration 2.31: Site elevation
A site analysis reveals that the suburb of Salvokop is characterised by the predominance of one storey buildings. Disorderly, overgrown areas (Figures G & H) contrast with the formal and structured environment created along Koch Street (E & F), leading up to the existing entrance of Freedom Park. Up to three independent informal traders have established themselves along a high traffic pedestrian route (A & B) selling fruit. These small kiosks are totally unaccounted for despite operating consistently.

It is the opinion of the author that the little development which the area has experienced is almost completely as a result of the construction of Freedom Park to the south of the suburb, and is development which has not benefitted the community to any great extent. A formal entrance to the Park was proposed and established along Koch Street, which provided the impetus to upgrade the roadway and establish a formal pedestrian boulevard. This overly dramatic axis does not seem to be used as intended, (it was to encourage public activity and development along a well-defined and constructed vehicular route) but instead sees very low levels of traffic, with temporary construction vehicles making up the majority of users.

In dramatic contrast, the long-established, informal pedestrian paths across the vacant sites in the area are in fact the high traffic axes. The high number of regular users (G&F) result in the permanent nature of these paths. No external effort has been made to formalise these routes. Instead, parking lots for businessmen and woman (users of the Metrorail) have been provided for, severely impacting on the nature of the spaces. Although a need for parking does exist, the manner in which parking has been created on this site (D), is, in the opinion of the author, an inappropriate response to a predominantly pedestrian environment. The high fences around the parking lots (C) create boundaries which perpetuate the separation between pedestrian and vehicular transport modes and inhibit the free-flow of pedestrian movement through the area. The latest parking lot, with fences completely surrounding it, has been built on the vacant site in the heart of the suburb (Figure 25). This is yet another illustration of the dominance of the need for parking which is provided at the expense of what is essentially a pedestrian scaled and focussed suburb.
Urban furniture
Unutilised, damaged or Inappropriate

The street scene (people and activities) is often largely determined by the character of the street furniture (Levy, 1998: 59). In the instance of Salvokop the contribution of the urban fittings is substantially negative as the more formal routes have alienated pedestrians who prefer the more informal routes. Formal seating is left unused whilst dustbins are damaged with parts removed. Furthermore, the placement of bollards which is intended to create a safe walking environment are more accommodating of cars than they are of pedestrians.

An attractive and functional public route is achieved through a coherent interaction of the environment with design. (Levy, 1998: 59). This means that even street furniture needs to be incorporated into a public route in a manner that combines aesthetics and function. Due to the severely neglected nature of the Salvokop street furniture, as evidenced along the main road (Koch street) leading up to the existing Freedom Park entrance, it would be fair to say that these fittings did not contribute positively to the street’s aesthetics nor its users’ experiences of it.

During a study of pedestrian movement on the site the eight
benches installed in the area where used only once, suggesting an over-supply of seating facilities in the area. Alternatively it could be reasoned that there is no need for people to sit down in this area as most users of the pedestrian walkway are travelling between the station and their homes or places of work. However, it is the view of the author that this pedestrian thoroughfare is an appropriate route for redevelopment into one which encourages stop-start movement or “space integrators”, as described by Dewar and Louw (2008: 20). As opposed to “space bridges”, which merely move people from one place to the next, space integrators provide reasons for people to stop and interact. This provides opportunities for growth of the community around transport, economic and retail nodes. Given the current state of the physical area and the nature of activities here, these opportunities are non-existent.

Figure 2.35. Existing section of Koch Street demonstrating the wasted space due to bollard placement.
Movement Analysis

An analysis conducted on the movement across the selected site revealed the high levels of activity occurring in that area. People using the footpaths could be broadly classified into five groups:

- Men and woman walking in small groups of one to five
- Uniformed workers ie nurses, security guards, police officers
- Parents taking their children to school or day-care facilities
- Children in uniform walking alone to school
- Cyclists

The two groups that contributed most substantially to those returning to Salvokop form the station were the uniformed workers who had just finished their night shift work, and school children travelling to attend the Jopie Fourie school in the South-West of Salvokop. The group of working adults came from all areas of the Salvokop walking towards the station. Cyclists originated solely from the western regions of the suburb. Some of the workers who use the footpaths are not residents of Salvokop but are instead Metrorail users from other areas of Tshwane who park in the formalised parking lot and walk to the station to catch the “business train” that travels to Centurion and Johannesburg. These users are however active strictly between 4:00am and 6:30am, they were therefore largely excluded from the analysis.

Other than the two or three small stalls (number dependent on the time of day) selling food and snacks that can be found along the route no other economic activities are presently utilising this opportunity.

Over a morning period of 2.5 hours from 5:55 to 8:25 more than 1000 people crossed the site in either direction, resulting in an average of

1 person every 8 seconds

These results show that area is currently under-utilised as an opportunity for development along a popular pedestrian passage. A formalised route could be established and equipped with local-based economic activities.
Figure 2.36: Map indicating analysed movement routes

Figure 2.37: Breakdown of users

- **A** = cyclists
- **B** = school children
- **C** = parents with children
- **D** = uniformed workers
- **E** = working adults
Figure 2.38: Graph showing pedestrian frequency across the site in 15 minute intervals

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<tr>
<th>Time (15min intervals)</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>Total (150min)</th>
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A = 397
B = 197
C = 119
D = 17
E = 360

Total = 1090
Relevance of analyses

- The considerable amount of pedestrian activity provides an opportunity for the establishment of a formalised pedestrian orientated route.
- The high level of pedestrian traffic requires an appropriate response regarding surfacing. Pedestrian-friendly, easily maintained surfaces to be considered.
- Although very few cyclists were observed in the area, provision should also be made to encourage this form of transport by providing bike racks and appropriate sloping level changes.
- The needs of business men and women who use the park-and-ride facilities can also be catered for through appropriate complementary economic facilities.
- Instead of only providing a surfaced walkway of minimally sufficient width, and with basic street furniture, the opportunity exists to create small nodes thus encouraging development of the informal and micro-economy of the area.
- A wide variety of users utilise this space, with the majority being young working adults. This fact supports the notion that developments in the area should have an economic focus.
SWOT Analysis

The SWOT analysis reveals the site as having potential as a gateway to connect Salvokop to the city whilst still preserving much of the distinctive identity and heritage of Salvokop as an urban village. A mixed-use development could provide the opportunity for local economies to emerge and flourish whilst simultaneously providing formal housing for those residing in Salvokop in informal accommodation.

In “Marketing Strategies” Ferrell (2008: 124) states that SWOT analyses are only useful if utilised effectively. Establishing the causes of certain occurrences, as opposed to merely determining their characteristics, can contribute to successful analyses. Trends are also highlighted as growth and opportunity indicators, and should be identified before action is taken. (Ferrell, 2008, 121)

In the specific case the causes of the site’s characteristics are due largely to its location and its vacant state, allowing unrestricted pedestrian movement to occur across it. Should the site be developed with a non-permeable barrier (as appears likely, as suggested by recent developments of a secure parking lot) the site would not receive any pedestrian activity.

As far as trends are concerned, the site, has, in the last ten years it been included and/or proposed as a pivotal site in all the major framework proposals (Re Kgabisa, Gapp, Intersite - see chapter 4 for detailed analysis of framework proposals). This confirms the officially perceived importance of the site as a gateway into the suburb.
<table>
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<tr>
<th>Tshwane Site</th>
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<tbody>
<tr>
<td><strong>Population (millions) 2007</strong></td>
<td>2.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Informal dwellers in 2007</strong></td>
<td>1158</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Density people /km²</strong></td>
<td>26.8%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Distance to station by foot</strong></td>
<td>450m</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Distance to station by car</strong></td>
<td>2.25km</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>The last time the site has been occupied by development</strong></td>
<td>1978</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Number of users in a 2.5 hr period</strong></td>
<td>1090</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>% of urban land</strong></td>
<td>1.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Population (millions) in 2007</strong></td>
<td>48.5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Statistics adapted from Statistics South African
“With the diminishing availability of land in relation to the growing number of people means we have to apply new technologies to build better. Again this emphasises the question of densification through social housing.”

(Housing in Southern Africa, 2010: 1)
Problem & Response

3

Problem statement
Hierarchy of challenges
Proposal
Summary of theories
Summary of relevant local documents
Discussion

Determining the exact problem and the related challenges. A proposal reinforced through the discussion of relevant theories and the manner in which they form the concept, along with other unimportant documents.
Problem Statement

The decrease of available land and resources in South Africa, in contrast to the increasing population within cities requires densification and the implementation of social housing to eventually encourage the development of urban communities.
Challenges to address

Housing people
Sustainable lifestyles
Density
Formation of communities
Creating belonging

Urban Scale

City
Precinct
Unit

Illustration 3.1 City scale
Illustration 3.2 Precinct scale
Illustration 3.3 Unit scale
Proposal

The author proposes a mixed-use intervention as a catalyst for social and economic growth in Salvokop. The development will allow for the establishment of a gateway to the suburb which is undergoing upliftment. Supported urban elements will include small businesses, existing pedestrian activities and social rehabilitation.
Summary of theories studied

**Supports - Habraken (1972)**

Supports is one of the primary protagonists of the open building movement and challenges the housing delivery process of post-war Europe suggesting that the development of dwellings needs to include not only the end-user during the process, but also to consider the greater needs of the community. The Modernist view of “effectiveness” is disputed due to its unspecific means of delivery and disregard of site specifics. The expansion of cities and the increased need for housing is likened to the growth of a biological organism, a process which should be directed as opposed to controlled. Housing is portrayed as arising from a diversity of activities performed by the occupant, and highlighting the important social component. **Supports** deals with the fundamental connection between the dweller and the dwelling in what is termed “the natural relationship”, the success of which is determined by the inclusiveness of the architecture and the delivery thereof.

**Front to Back - Lewis et al. (2005)**

**Front to Back** presents urban housing as a fundamentally all-inclusive issue with specific reference to its nature as an urban-scaled matter. In order for a comprehensive approach to be formulated in order to tackle the matter, evidence regarding urban, social, communal and sustainable influences need to be identified and understood both individually and collectively. Furthermore, aspects of permeability, socio-spatial quality, legibility, flexibility, adaptability, energy efficiency, privacy, variety, activity and vitality need to be addressed to ultimately create housing that will be successful as a development and as a home. In essence **Front to Back** focuses on the establishment of housing in a systematic but sensitive manner, whilst creating a balance between public and private arenas.

![Natural relationship](image-url)

Small Change challenges the notion of development through public observation as opposed to the more conventional public participation. Existing activities are identified and utilised to stimulate growth. Economic, cultural, social, residential or circulatory nodes are all considered for positive influence on the broader community. Elements with catalytic properties are added as a layer to the existing activities to stimulate natural growth. This type of development has the potential to be more successful due to its grass-roots nature, where the ideas of regular citizens are sought, realised and expanded, and due to the possibility that the applied or structured systems instituted by external developers will be more acceptable to the society destined to live in them. Furthermore similar activities are connected in a series of networks. Small Change is concerned mainly with the growth of emergent systems through its focussed application of structured development as a catalyst for development.
Summary of relevant local documents

Faster, Harder, Smarter

Faster, Harder, Smarter is a vision by the Tsela Tshweu Design Team (consisting of members from the Council for Scientific and Industrial Research (CSIR), The South African Institute of Architects (SAIA), South African Institute for Civil Engineers (SAICE), Council for Scientific and Industrial Research (CSIR), and SHIFT (Social Housing Focus Trust)). The vision is an expression of opportunities within current policy framework prepared for the Department of Human Settlements in order to determine a way forward in the establishment of sustainable and humane settlements in South Africa. The vision is based on ten key principles which focus on the delivery of these inclusionary settlements.

(Tsela Tshweu Design team, 2010)
Breaking New Ground (BNG) is the latest government policy with regard to the form of housing delivery. Amongst others, the most drastic change from previous government policies is the progression away from a product orientated system towards a process directed one. This includes end-users’ participation in the development of their homes, enhancing perceived value and pride of ownership, which contribute to the success of the entire project.

(South Africa, 2004)

Although only a Green Paper, with no government obligations attached to it yet, the Green Paper on Climate Change (2010) appropriately responds to the steadily declining state of our planet. Aspects of environmental, economic and social change are addressed, spheres which affect the built environment severely. This document therefore serves as a very clear indication of the direction of governmental policy formulation regarding climate change, energy use, waste management and other topics covered by the broader sustainability agenda.

(South Africa, 2010)
Existing activities are identified and utilised to stimulate growth. Economic, cultural, social, or residential nodes are all considered for positive influence on the broader community. Elements with catalytic properties are added as a layer to the existing to stimulate natural growth.

Front to back presents urban housing as a fundamentally inclusive issue with specific reference to its nature as an urban-scaled matter. In order for a comprehensive approach to be formulated in tackling the matter, evidence regarding: urban, social, communal, and sustainable influences need to be perceived. Ultimately focusing on the establishment of housing in a systematic but sensitive manner whilst creating a balance between public and private areas.

The vision is an expression of opportunities within current policy frameworks prepared for establishment of sustainable and humane settlements in South Africa. The vision is based on the Department of Human Settlements in order to establish a way forward in the ten key principles which focus on the delivery of these inclusionary settlements.

2.26.1 Everyone has the right to have access to adequate housing. 2.26.2 The state must take reasonable legislative and other measures, within its available resources, to achieve the progressive realisation of this right.

Breaking New Ground (BNG) is the latest policy with regard to the form of housing delivery. Amongst others, the most drastic change from previous government policies is the progression away from a product-oriented system towards a process-directed one. This includes end-users in the development of their homes, ascribing value and ownership which contribute to the success of the entire project.

"Proper functioning of the natural relationship not only allows the dweller to possess his dwelling in the fullest sense of the word but simultaneously allows inhabitants to possess their neighbourhood."

(Habraken 1972: 98)

Green Paper on Climate Change (2010)

South African Constitution (1996)

Front to Back Lewis et al.

Supports - N Habraken

Aspects of environmental, economic and social are addressed, spheres which effect the built environment severely. This document therefore serves as a very likely indication of the direction of governmental policy regarding climate change, energy use, waste management and other topics covered by the broader sustainability agenda.

Figure 3.6 Heirarchy of applied theories
Theory related to technical aspects

How buildings learn (Brand: 1994)

A building properly conceived is several layers of longevity of built components (Duffy in Brand, 1994: 12)

The building should contain the potential to grow and adapt to new functions and uses.

- **Site** is the geographical component, it is eternal and outlasts structures and generations.
- **Structure** is the essence of the building, changes to these elements are expensive and often fundamentally unfeasible and can last from 30 to 300 years.
- **Skin** of a building is the elements which make up the external surfaces and has a close link to technological advancements due to the balance between permanence and flexibility. This layer contributes greatly to the energy efficiency of a building and is changed or significantly modified every 20 years.
- **Services** are the working parts of the building and include wiring, heating, cooling and ventilation systems, lights, plumbing and moving installations such as elevators. These can be replaced due to wear and tear every 7-15 years. If services are too deeply embedded into a building it could result in unnecessary demolition.
- **Space Plan** is the interior layout of a building, the positioning of doors, walls and ceilings that create spaces for different uses. This could change in commercial or office spaces every 3 years.
- **Stuff** is the items that users regularly interact with, the furniture as arranged with the space plan. These elements change constantly and can be replaced or relocated daily.

Figure 3.7-13 Heirarchy of the various building layers
Discussion

The proposal of a mixed-use housing development is intended by the author as a response to a number of theories relating to the development and management of the built environment. The provision of low-cost housing and the process of delivery is a contentious matter and it has already been established that the South African government department tasked with addressing this issue has allocated extensive resources to the situation.

Chapter 2, Section 26 of the South African Constitution, deals with human rights with regard specifically to housing (South Africa, 1996). Not only does the Constitution state that it is the right of every human being to enjoy adequate housing, but the second clause (2.26.2) declares that the state has the responsibility to achieve the realisation of this right (South Africa, 2009). This places the onus on government to refine the existing product as well as the processes of delivery in order to better fulfil their responsibility.

During the first ten years after South Africa’s first democratic elections housing delivery was focussed on generating a product and devising a delivery system which was evaluated quantitatively (Osman, 2007). These buildings were eventually termed “1st Generation Houses” and were sufficient as buildings but fell desperately short as homes as they neglected the spaces that create liveable, homely environments (Dewar, 1998). The continuity of spaces needs to occur not only within the limited interior of individual dwellings, but also through the entire development of which the individual dwellings forms a part. The provision of continuity is described by Chiba (2003: 6-7) as the element of highest importance in the provision of collective housing.

This priority to achieve continuity is perceived as a fundamental design component in the delivery of social housing by Lewis et al in “Front to Back” (2005: 140). The complete integration of a development into its greater urban context, and the factors contributing to the definition of all spaces, whether public or private, need to be considered. These include permeability, legibility, energy effectiveness, variety, privacy, activity and adaptability (Lewis, 2005: 40-44).

These aforementioned considerations, when understood and appropriately applied, determine the quality of the house as a whole as well as that of the spaces around it. This process of understanding quality was not only overlooked by the 1st Generation Housing movement in South Africa but also by European governments when faced with the monumental task of providing emergency housing.
2.26.1 Everyone has the right to have access to adequate housing.

2.26.2 The state must take reasonable legislative and other measures, within its available resources, to achieve the progressive realisation of this right.

soon after the Second World War (Habraken, 1972: ix). The need for housing was dire and urgent, and needed to be met with immediate action. The resultant continental surge of development coincided with the Modern Zeitgeist (Spirit of the times) which portrayed the home as a “machine for living”, and the process of providing homes was reminiscent of a factory (Habraken, 1972: 64). These factors lead to the complete neglect of the spaces connecting and surrounding houses. The repetition of house designs and the neglect of their spatial context was believed to lead inhabitants beyond a mind-set of disappointment and into one that took offence (Habraken, 1972: 4). This meant that although these houses were supplied to dwellers at substantially lower costs, they were not appreciated due to the lack of humanity in their design and the almost complete lack of community involvement in their genesis.

This process of end-user resentment caused by government subsidised housing occurred again almost 50 years later during the South African government’s delivery of 1st Generation Housing. The nominal achievement of “Freedom” and “Democracy” generated pressures that resemble those faced by European states in the late 40’s and 50’s. This has lead, in South Africa, to a shift in priorities in the delivery of housing from being a product-based system to one that focusses more on the process of delivery, a more qualitative approach (Osman, 2007).

This new means of delivery was formalised in South Africa in the Breaking New Grounds Policy (BNG) which was accepted by Cabinet in 2004. BNG focuses on the process and ultimately on the needs and wishes of the people the houses are going to be housing. The aspect of community involvement that has now been included in the process is concerned more with presenting new horizons for development as opposed to just giving users what they thought they wanted (Osman, 2007). This has challenged the archaic perception of the architect as the educated professional whose job it is to give the user (the short-sighted lay-man) what the architect believes the lay-man needs. The now preferred combination of a professional point of view with the intrinsic reaction of the user could yield more positive results, steering clear of the notion of sheer “effectiveness” (Habraken, 1972: 3). Once housing can be understood as the physical manifestation of a collection of human activities a clearer objective can be set in attempting to successfully house the nation. (Habraken, 1972: 7)

The activity of the occupant within the housing unit forms one half
of the “natural relationship” according to Habraken in his seminal work “Supports” (1972). The environment in which people live is the second half of this natural relationship. The role of the architect or designer is to interpret and manage this relationship by creating an appropriate response which accommodates the needs of both. The initial inputs of the designer can to a large extent determine the maximum potential of this relationship between inhabitant and the environment in which he/she exists. A fully functional mutual relationship establishes the platform for the dwellers to fully inhabit and eventually possess the dwellings and simultaneously allows the inhabitants of the neighbourhood to take possession of it (Habraken, 1972: 98). Although this process includes the act of taking possession of dwellings it can still be achieved using rental housing, even though the physical structures remain the property of the social housing foundation that established them. Possession involves human action whereas ownership is a matter of legalistically defined entitlement (Habraken, 1972: 18).

As far as the role of the architect is concerned, sustainability is achievable once the occupants have developed a strong desire for a high quality environment. A high quality living environment encourages an appreciation of the natural environment which in

“Proper functioning of the natural relationship not only allows the dweller to possess his dwelling in the fullest sense of the word, but simultaneously it allows inhabitants to possess their neighbourhood.” (Habraken, 1972: 98)
turn creates a desire of possession. According to Lewis (2005: xv) this appreciation is a key stepping stone towards sustainability, because, once houses are appreciated, they are more likely to last because maintenance and general up-keep tasks are undertaken by residents, who are encouraged by pride and a sense of possession, instead of grudge and obligation. This results in a longer building life-span.

Housing, which represents the living, cleaning, eating and resting portion of living, cannot be completely appropriate or successful if substantially separated from the act of working. Location, accessible to health-care and work opportunities, is the first and most vital aspect to consider for housing (Osman, 2007). The location of housing relative to the location of existing work, health and educational infrastructure is therefore key to success. Location close to important transport, economic or cultural nodes provides residents with an opportunity to interact with their surroundings. Development along potential “space bridges” (Dewar and Louw, 2008: 20) also generates a tension which stimulates the generation of informal economic activities. (Osman & Lemmer, 2005)

It is this type of development that Hamdi identifies and examines in his book “Small Change” (2004). His case-studies show how purposefully small-scale interventions encourage an existing activity and act as catalysts to stimulate positive growth. The challenge of successful development lies in finding the balance between emergent systems and the overlay of structured designs which can facilitate, not stifle growth (Hamdi, 2004: xvii).

As illustrated in figure 3.6, the process of development proposed by the author in this discussion begins with understanding the existing activity (i.e. fetching water from a standpipe or selling fruit and sweets to a passer-by), which is the first element. This activity is in response to a need or process (i.e. the need for water; the opportunity for economic engagement with pedestrians), and will be termed the emergent, the second element of the development process. A third element, ie the stimulant, reacts to the activity by addressing the emergent. This ensures that the catalyst does not overwhelm the original, existing activity by perhaps demolishing it and re-building something more “formalised” or “better” in its place, but instead empowers those involved with the emergent’s processes to better equip them to achieve their goals and to expand their possibilities through broadening horizons - a process involving the realisation of potential; a process akin to the watering of a seed to encourage germination and growth.
Establishing what social and economic activities are already taking place in the focus area and surrounding.

Understanding the cause of activities as well as its effects, i.e., why the activity can take place.

Determining how this can be stimulated, grown, developed, encouraged.

Figure 3.14: Project Parti diagram
“Network Governance: An inside-out structure of social organizations and well-networked systems rather than command and control hierarchies or power elites analogous to organic systems”

Framework for Salvokop

4

The Bigger Picture

Problem Statement

Vision & Parti

Connect & Preserve

Analysis of Existing Frameworks

Proposal

An understanding of the area of Salvokop and the importance of its unique nature informs the development of a framework for the entire area to guide development towards a common goal.
Figure 4.1: Map of Pretoria with vibrant and potential nodes and public and private spaces mapped.
The bigger picture

Public and private open spaces in Pretoria Central and Pretoria West were explored and surveyed, and vibrant and potential nodes were identified and mapped. Salvokop was classified as a potential node due to the lack of activity, but counter-balanced by its possibility of becoming an active, high economic and social energy area. Due to its ideal location close to employment opportunities, transport terminals and other amenities it has the potential to develop into a healthy, well-functioning and popular area. But, due to the railway line separating Salvokop from the city the entire area has been insulated from the energy that makes the inner city meaningful. The historic and residential component, combined with the newly established cultural and tourist attraction (Freedom Park) ensure a unique character with the potential of growth.
Problem statement for Salvokop

The isolated nature of Salvokop, caused by the railway, has lead to the development of a unique character. This separation has, however, also resulted in a disconnectedness of energies and activities from the rest of the city.
Framework Vision and Parti diagram

The connecting of different entities whilst still preserving the separate identities.
Connect

verb. (kə-někt’)

• bring together or into contact so that a physical and/or metaphysical link is established.
• to establish a relationship between unique edges

route, destination, landmarks, waste, social, economy, access/accessibility, urban, activation, bridging, transport node, residential, informal trade, public space, industrial, tourism, breathing space, street edge, sustainable, landscape urbanism, urban farming, social housing, planning level, safety, prescription, catalyst, waste landscapes, energies, experience, spatial level, movement, views, activities
Preserve

verb. (při-zůrv’)

- maintaining the fabric of a place in its existing state and retarding deterioration (Burra Charter: 1979)
- maintaining the activities on grass root level and establishing a network (Hamdi: 2004)

heritage, conservation, character, identity, waste landscapes, social, ruins, ecology, railway, urban fabric, residential, informal trade, public space, processes, patterns, energies, industrial memory, breathing space, experience, mnemotechnic devices, catalyst, urban village, railway, sustainable, planning level, spatial level, chance encounter, movement, views, activities

Figure 4.8: Preserve Concept
Analysis of existing frameworks

GAPP framework

STRENGTHS
- Increased accessibility - new vehicular bridges
- Respect for historic
- Activation of site - quick & light (industrial proposal)
- Mixed use - no monofunctionality - diminished link of Sakekop & city

WEAKNESSES
- Bad vehicular access positioning (north)
- Connections of above and below (bridge ignored)
- North accessibility becomes a thoroughfare
- Framework is building orientated & ignores ecological systems
- Focusses on Infra
- Quick fix solution
- Inappropriate handling of heritage

Figure 4.9: Gapp framework strength and weaknesses

Tshwane Open Space framework

STRENGTHS
- Focus on greater picture
- Focus on open spaces
- Incorporation of pedestrian and ecology
- Zonal framework

WEAKNESSES
- No specific reference to Sakekop and its character
- No economic or social considerations
- Zonal framework ignores character and detail

Figure 4.11: TOSF strength and weaknesses

PRESERVE
- Respects historic fabric
- Increases residential
- Does not provide for informal trading spots
- No preservation of existing character and identity
- Planning level ignores spatial character
- No preservation of open breathing spaces

CONNECT
- Increased accessibility - new vehicular bridges
- Activation of Sakekop which connects it to city
- Bad vehicular access positioning (north)
- North accessibility becomes a thoroughfare
- No thought for metaphysical connection

Figure 4.10: Gapp framework connect and preserve

Figure 4.12: TOSF framework connect and preserve
Re Kgabisa framework

STRENGTHS
- Strong Paul Kruger street axis
- Encouraged slow development
- Links Salokop to city physically and economically
- Increased access to Salokop

WEAKNESSES
- Memorial based
- Focus on governmental sector
- No focus on character or community
- No environmental consideration

Figure 4.13: Re Kgabisa strength and weaknesses

Arup framework

STRENGTHS
- Arts and culture activation of Salokop
- Destination points
- Addition of uses to Salokop

WEAKNESSES
- No concern for character or community
- No environmental consideration
- No concern for heritage fabric
- No concern for public interface
- Continues to create fenced off islands

Figure 4.15: Arup framework strength and weaknesses

PRESERVE
- No focus on character or community
- No sign of preservation of the existing urban fabric
- No acknowledgement and response to existing activities and processes on site

CONNECT
- Strong Paul Kruger street connection
- Links Salokop to city physically & economically
- Increased access to Salokop
- Governmental use makes Salokop an important node in the city
- No metaphysical connections to Salokop

Figure 4.14: Re Kgabisa framework connect and preserve

Figure 4.16: Arup framework connect and preserve
Figure 4.17: Map showing connect and preserve application areas

Germinate - Architecture of Growth
Proposal

The proposal for Salvokop rests primarily on giving substance to the concepts of “connect” and “preserve”. By connecting existing activities internally and to the rest of the city they will have the opportunity to revive and flourish; this will also increase awareness of the area and promote the efforts to preserve the heritage and to improve the social and economic situation of the local residents.

Whilst existing frameworks considered isolated aspects of the above proposal, a combining of the strengths of each would provide impetus for a healthier city environment.

Connect

The importance of promoting vehicular access is recognised as a key component of increasing the volume and positive impact of the proposed new activities. It is for this reason that a new access road entering Salvokop from Andries Street is proposed. This would link into the important traffic node in the south of the study area, just north of Freedom Park. Skietpoort Avenue would also be extended to link up with the aforementioned node. This extension would also create a pedestrian-friendly street, if combined with traffic calming measures such as paved surfacing.

Pedestrian-only routes (such as the bridge from the station) would be given high priority and appropriately complemented through a widening of walkways and the use of paving material where none currently exist.

Retail, office, conference and hotel facilities proposed on the north-eastern slope overlooking the railway line would provide an opportunity for members of the public to view both the existing Blue Train platform below and the proposed pedestrian-friendly route on the Skietpoort road extension.

Preserve

The suburb’s existing inhabitants, their activities and the buildings they use should be recognised and appropriately responded to. It is for this reason that preservation forms a fundamental role in this development proposal. Although it might slowly evolve in the future, the current residential fabric should be respected and protected, with all the proposed important thoroughfares being directed around the suburban environment in the south-western region of the suburb. The largely abandoned northern area north of the existing Skietpoort Avenue will in all probability experience
Figure 4.18: Map showing proposal
development on the fringes whilst the majority of the area will be transformed into a landscaped wildernessstyled open space (thus avoiding the creation of sterile nonplaces) that becomes accessible to residents.

This proposal is based firmly on balancing both elements of connect and preserve. If Salvokop were to be treated merely as an extension of the CBD, and its unique identity disregarded in favour of introduction of an extensive new network of roadways in order to firmly connect the area to the city, much of the existing character would be destroyed and an opportunity for human scaled re-development would be lost. At the other extreme, if the area were to be too vigorously protected and access even further restricted, it would simply suffocate the existing actives resulting in a continuation of the slow yet steady deterioration of the region as a whole.

Figure 4.19: Section A-A before and after proposal implementation
Figure 4.20: Section B-B before and after proposal implementation
Background (chapter 1)

Urbanisation

Sustainability

Housing in SA

History of Slavokop

Aerial History

Salvokop Framework (4)

Connect

Preserve

Changing value of land

Analysis (2)

Pedestrian movements

Vehicular movements

Existing conditions
(3) Theories
- Habraken - Supports
- Lewis - Front to Back
- Hamdi - Small Change
- Brand - How Buildings Learn

(3) Local Documents
- Breaking New Ground - 2004
- Green Paper on Climate Change - 2010
- Faster Harder Smarter - Tsela Tshweu design team

Figure 4.21 Diagram showing the formation of guidelines

Developed Guidelines
- Located within walking distance from work opportunities or transport terminal
- Medium to high density
- Address the immediate needs of the locals/residents
- Incorporate a balanced mixed-use environment
- Appropriate & responsive pedestrian scale
- Form part of a sustainable long term plan
- Facilitate the formation of communities

- Balance between public & private spaces
- Develop emergent activities
- From product-based to process-based delivery
- Challenging housing delivery system
- Densification
- Public transport support
- Encourage the development of communal spaces
- Encourage the formation of communities
- Facilitate the formation of communities
- Technical innovation to serve a vision
- Phased and adaptable developments
- Street edge activation
- Refocus Government Subsidies on 1hr (3km) wide neighbourhoods
- Rezone to encourage desegregated mixed-use
- Appropriate & responsive pedestrian scale
- Form part of a sustainable long term plan
- Facilitate the formation of communities

Architecture - Housing - South Africa - Sustainability - Community
Figure 5.1 Montage of various precedents
Guideline Testing vs Precedents

Lessons learnt from precedents

TAU village - Pretoria
Brickfields - Johannesburg
Joe Slovo Precinct (of N2 Gateway project) - Cape Town
Mieres Social Housing - Mieres, Spain
Public Reception Square
Grenoble Housing - Grenoble, France
Duren Residential - Duren, Germany
Linked Hybid - Beijing, China
31 Lower Terrace - Pretoria

Testing of developed guidelines against existing residential buildings already implemented locally and abroad. These projects provide important lessons on background, design and execution of social orientated housing projects
Table 5.2 Testing of guidelines against precedents

<table>
<thead>
<tr>
<th>Guidelines</th>
<th>Tau Village</th>
<th>Brickfields</th>
<th>N2 Gateway</th>
<th>Dewar and Uitenbogaard</th>
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<tr>
<td>2. Medium to high density</td>
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<td>![Leaf]</td>
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</tr>
<tr>
<td>3. Balanced mixed-use environment</td>
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<tr>
<td>4. Part of a long-term plan</td>
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<tr>
<td>5. Address the immediate needs of locals/residents</td>
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<td>6. Facilitate the formation of communities</td>
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<tr>
<td>7. Appropriate &amp; responsive pedestrian scale</td>
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<tr>
<td><strong>total</strong></td>
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<td>3 - 43%</td>
<td>3 - 43%</td>
<td>4 - 57%</td>
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<td>Herman Hertzberger</td>
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<td>Steven Holl</td>
<td>Nieuwmarkt</td>
<td>Linked Hybrid</td>
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<td>------------------</td>
<td>--------------</td>
<td>-------------</td>
<td>------------</td>
<td>---------------</td>
</tr>
<tr>
<td>Duren Residential</td>
<td>Herbelus House</td>
<td>Nieuwmarkt</td>
<td>Nieuwmarkt</td>
<td>Linked Hybrid</td>
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<td>9 - 75%</td>
<td>5 - 42%</td>
<td>6 - 50%</td>
<td>5 - 42%</td>
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Architecture - Housing - South Africa - Sustainability - Community
Lessons learnt from precedents

**Tau Village**
The Tau Village development demonstrates the possibilities of incorporating a number of different uses into a single development and the importance of implementing a hierarchy of access control measures that also cater for social facilities that require increased control. The location and density displayed by the development is due to existing factors but are nonetheless appropriate for the building’s new programme.

**Brickfields**
The scale of Brickfields means that it has a significant impact on the housing stock for the area and indeed the city of Johannesburg. One of South Africa’s first large-scale housing developments to combine opportunities for separate small business premises, as well as units with space to live upstairs and work downstairs and direct exposure to the street and the public. The courtyard typology was also used in this case, with the open space used for parking and children’s play areas. A healthy variety of units and types has resulted in a viable mix of users and usages. Also, being part of a larger series of implementation, Brickfields was designed as the housing initiative for broader development.

**Mieres Social Housing**
Much like Brickfields, the social housing development in Mieres in Spain by Zigzag architects forms part of a much larger development and framework. Mieres exhibits a history similar to Salvokop with its railway and industry background. The fresh application of the courtyard city block with a semi-public space shows the potential of design in a challenging environment. The connection to the site and the manner in which naturally existing informants were used to encourage the design show the possibilities of simply calculate decisions.

**N2 Gateway project**
The immense scale of this Cape Town project has proven to be a stumbling block in achieving successful implementation and ongoing maintenance of the project. Initially an exciting intervention, much of the original hype has died away as residents have become unhappy due to poor upkeep of the rental units and a lack of attention given to creating and maintaining public areas. This proves the importance of initiating and implementing a system of housing and living that can become sustainable. A valuable lesson to be learnt from this project is the importance of insightful planning of implementation system and how the development functions as a whole.

**Project for a public reception square**
The public reception Square illustrates the potential for a public space which is supported by surrounding buildings and landscaping. Mixed use on ground floor with offices or housing above, along with
its location in the middle of the city, close to transport links, provides a platform for a vibrant public environment which also acts as an important information node for new visitors to the city.

**Grenoble**
The Grenoble Housing block located in a growing city at the foot of the French Alps is part of a larger urban development plan. Environmentally sustainable solutions have been applied, including an innovative system for the façade, but it is the influence as a part of a broader development that makes it so successful. This housing project demonstrates the value of a simple solution as a portion of a larger-scale endeavour.

**Duren Residential**
Unlike the Grenoble example, Herman Hertzberger’s Duren Residential block in Germany does not fit into its environment seamlessly. Instead, an island of housing has been created in a neglected suburb of old houses. With a strong physical connection to its surroundings suburbs by means of pedestrian and vehicular access routes, the project adequately demonstrates the balance between providing for residents and the neighbouring community. A large public green space bisected by an access road and surrounded by double storey-walk-ups ensure a safe environment for inhabitants and the general public to interact in a pleasant outdoor space.

**Linked Hybrid**
Steven Holl’s renowned Linked Hybrid in Beijing challenges the traditional standards of volume for inner city buildings. Breaking the mould for conventional housing blocks the opportunity has been used to create a cluster of eight tower blocks of different heights, linked at different levels. Public functions inhabit the more easily accessed levels whilst over 600 living units complete the complex. The unique pedestrian bridges over seventeen stories above ground level create a unusual interaction for residents and visitors and create niches of activity despite the immense scale of the project.

**31 Lower Terrace**
House 31 in Lower Terrace St, Pretoria provides an example of how a steel structure can be appropriately implemented for residential purposes. Due to the roof being largely a separate component of the structure, it can be simply removed to accommodate the installation of additional stories should the need arise. The corrugated sheeting skin, including face-brick and plastered surfaces, results in a variety of façade that creates a pleasant aesthetic. The large surfaces of glazing are appropriately orientated and afford the building interior a healthy dose of light.
An adaptive re-use project incorporating a variety of uses and functions. The architects of this recently completed (Sept 2010) project were faced with a variety of challenges when converting the abandoned offices of the Transvaal Agricultural Union (TAU) to a mixed-use housing development: first of all, the issue of re-using an existing building and converting its function has specific challenges, and secondly the incorporation of various uses into a single structure.

Re-use

The building’s existing blocks A and B were converted and upgraded into housing units, with retail spaces on the ground floor facing the street, whilst a new block (C) was built at the back of the site and accommodates Lerato House, an old age home, a creche and additional housing units.

Due to the poor condition of the interior, caused by the illegal occupation of the building prior to renovation, a replacement of finishes was desperately required. Selected fittings and refurbishments are simple and heavy-duty, which offer the interior spaces an elementary feel. Combined with the red, blue and yellow paintwork to highlight important structural or circulatory elements (columns, balustrades and central passages) an uncomplicated language is articulated throughout the structure inside and out. Re-appropriation of the

Illustration 5.3: The inconspicuous facade of the TAU building with shops opening up onto the street

Opposite page: Illustration 5.4: The quiet green space at the back of the lot provides a peaceful breathing space in the busy city
existing office space proved more of a challenge than originally anticipated when the structure was deemed unsuitable for any extension. This meant that the flat roof was not able to support additional floors or a roof garden unless costly structural upgrades were undertaken. The change in use required a relocation of the central wet services areas required in each of the units. Bathrooms were placed on the inner, passage-way side of the unit to maximise natural lighting into the unit. Unfortunately a similarly healthy dose of light and air could not be afforded to the dark corridors throughout the development due to fire regulations restricting the use of the existing fanlights.

**Mixed-use**

The development accommodates a healthy variety of uses with retail spaces for small businesses, accommodation for families, couples, working individuals, the elderly and disenfranchised young women, and provides accommodation for pre-schoolers with working mothers. The access to these various uses is controlled primarily through an existing circulation axis located on the west side of the building which was extended into the new C block, whilst the existing vertical circulation shaft between Blocks A and B was retained and easily serves all three blocks. Ease of movement through the ground
Germinate - Architecture of Growth
floor spaces is required due to the high traffic caused by the need to drop-off and pick-up users of the crèche and old age home facilities. Any additional space on the ground floor was utilized to create small gardens which included the use of old tyres as containers for small plants.

Due to restrictions of time and money the developers’ intentions to install components such as solar-water heaters and flower-boxes on the façade could not be realised, and their absence is notable. The simple functional language is however successfully sustained throughout, providing a platform for future additions.

The housing units are small but still appropriate, and whilst the majority of the residents prefer the newly built C block which overlooks the surprisingly tranquil green space at the back of the lot, it is neither the freshness of the new building nor the green space which attracts them, but instead the comparatively quiet, tucked-away environment which it offers so effectively. However where some residents enjoy the peacefulness of block C, others have the easily accessible flat roof directly above which offers stunning night views and on occasion the distant roar of the lion from the Pretoria Zoological Garden.

**Conclusion**

Although the approach to the construction of the new TAU building does anything but draw attention to itself, as a whole the building provides a uniquely responsive living environment, one shaped by modest green spaces, open gathering areas and living units, all set out in a fashion appropriate to high density city living. The success of this project is confirmed by the extensive waiting-lists for occupation.
Brickfields - Johannesburg
Savage & Dodd Architects cc, Fee & Chalis Architecture & Makhene Architect and Associates

Brickfields is part of a larger redevelopment project in the area of Newtown, Johannesburg. Along with two other precincts (C & A/B) Brickfields provides the previously absent residential component to this area which is experiencing much needed upliftment, whilst the Nelson Mandela Bridge and the Metro Mall transport Interchange provide the infrastructure to support the overall regeneration initiative.

Two and three bedroom units are arranged in four storey walk-ups with considerable street frontage around a large courtyard which includes parking and children’s play areas. Two tower blocks (nine and ten stories high) located at opposite corners of the precinct provide a high-density living environment and an increased number of residential units. Live-work units are located on edges of the redevelopment facing Ntemi Piliso and Gwigwi Mnwebi Streets, which are important pedestrian routes and provide opportunity for small businesses selling groceries and snacks, or offering personal services such as dry cleaning and laundry services, hairdressing and similar.

Social facilities, including a crèche and a home economics centre, are also incorporated into the development to promote the mixed-use nature of the project.

Simple materials are used throughout with a basic aesthetic created through the utilisation of exposed brick, interspersed with brightly painted plaster finishes which also create visual variety.
Illustration 5.10: View of the central courtyard space with parking and childrens' play area, with the nine-storey tower block in the background.

Clockwise from top right:

Illustration 5.11: Interface of the shop component of the live-work units with the street.

Figure 5.12: Plan of the entire development with the Brickfields precinct in colour.

Illustration 5.13: Deserted courtyard spaces inbetween housing blocks originally planned for landscaping.

Opposite page:

Illustration 5.10: View of the central courtyard space with parking and childrens' play area, with the nine-storey tower block in the background.
Joe Slovo precinct - Cape Town
JSA Architects and Urban Designers

The Joe Slovo precinct was completed in June of 2006 in Langa, Cape Town along the N2 highway and forms part of the larger development known as the N2 Gateway project. The site was chosen because of its proximity to the Joe Slovo Township which allowed the opportunity for an upgrading of existing infrastructure as opposed to the more costly establishment of new infrastructure.

The housing consists primarily of bachelor, and one and two bedroom units arranged in medium density three storey walk-ups. This higher density design capitalised on the opportunity offered by the strategically located land with its ease of access to existing facilities and impressive views of Table Mountain. The units face onto internal courtyards which create a space for social interaction and the hanging of laundry.

Due to the expansive nature of the development a number of these courtyard blocks were linked with narrow streets creating a network of linked public gathering spaces throughout the development. The extensive scale of the development also informed the design on a smaller scale with robust materials and simple details repeated throughout.

Although largely mono-functional the development does also allow for the operation of small businesses and social facilities such as a crèche and a trading area.
Opposite page (Clockwise from top-right):
Illustration 5.14: Units have a combination of access from inside and outside the courtyard.
Illustration 5.15: Courtyards are generally darker and used primarily used as clothing hanging space
Illustration 5.16: The extensive installation of satellite dishes indicates the more middle class (as opposed to lower-class) parts of the development
Illustration 5.17: Narrow roads between blocks allow for the circulation of vehicles but miss the opportunity to provide pleasant landscaped strips.

Figure 5.18: drawings showing typical blocks of the three-storey walk-ups
Mieres Social Housing - Spain
Zigzag Arquitectura

Mieres is a small town in the North of Spain with a fading legacy of mining and heavy industry. Situated just to the south of the centre of town is a vacant area awaiting interventions that will result in redevelopment. The proposal for social housing by Zigzag architects was approved for implementation because of its appropriate use of materials and its arrangement of varying sized apartments.

The scheme is based on a conventional courtyard block which is adapted to maximise views of the surrounding mountains and solar gains - which was in accordance of the intention of the architects: that the building would be connected to the site.

The implementation of contrasting façade materials informed users of the distinction between public and private realms. An African hardwood was chosen for the areas facing the courtyard to symbolise a return to nature and the courtyard itself is planted with native grasses and bamboo to create a “secret garden” effect in the form of a semi-public area, a breathing space in the harshness of the surrounding urban environment.

An overwhelming aspect of the scheme has been its capacity to transform a neglected precinct through the application of appropriate architecture. (Slessor: 2011, 54-61)
One of the proposals included in South African Cities: A Manifesto for change (Dewar and Uitenborgaardt, 1991: 108) was a Reception Square for a South African city. The purpose of the space is to allow for a welcoming public square located close to an important transport terminal. The space receives visitors and guides them towards a place of information. This model is especially relevant in South Africa due to the high number of rural dwellers who are occasional city users. They travel long distances from their rural homes to receive health care, apply for identity documents or to buy items that are not available in their rural centres.

The reception square promotes the establishment of an economic strip giving users immediate access to the relevant shops and services. The arrangement of the surrounding buildings supports the form and function of the square. Multi-storey buildings of moderate density ensure the development is not out of context in the city, whilst landscaping softens the hard edges of the urban landscape.

The reception square proposal provides an important public space for visitors and locals to access a variety of goods and services as well as an opportunity to interact with one another in an open public environment.
Located in a growing metropolis at the foot of the French Alps the social housing development in Grenoble is an experiment within a greater exploration. Forming part of the zone d’management (ZAC), a well-known urban redevelopment plan, Francois’s housing blocks is one of many players in this so-called “eco quarter”. Along with a host of other architects and urban planners the entire precinct is being redeveloped, with the intention of having a greater positive impact on social systems whilst conversely having a lighter impact on environmental ones (Slessor: 2010, 72-74).

Innovation on the façades through use of new materials that change over time due to weathering and vegetation growth are only mildly significant in comparison to the larger impact the building has as part of a broader and therefore more substantial development.
Duren Residential
Herman Hetzberger

When viewed in context, it is clear that the residential complex at Duren is not simply “business as usual”. Located in and amongst many run-down welfare houses the housing development by Herman Hertzberger sets an appropriate precedent for what could be. A perimeter block with double storey walk-ups and an access road bisecting the central courtyard allows for a balance between communal interaction and privacy.

The scale of the open space has become an opportunity, and has been adopted by locals from the entire suburb as a town square and meeting place. The development of this open space was not subjected to a sacrifice of socio-spatial quality, but instead it still fulfils the needs of the residents through the implementation of small-scale elements like balconies and galleries (Raith & van Gool, 1998: 18-28).

Viewed as whole, set within a slightly dysfunctional suburb, the residential complex at Duren strikes a balance between the immediate needs of its residents as well as those of the broader community.

Clockwise from top
Figure 5.27: Image showing the movement through the block and spill over from the housing into the green courtyard
Figure 5.28: Plan showing the location of the residential development
Illustration 5.29: View of housing units surrounding a green courtyard
Linked Hybrid
Steven Holl

Located in the densely populated metropolis of Beijing, Linked Hybrid challenges the notions of horizontality and verticality that so often dominate the urban skyline under the hybrid typology banner. Eight towers of varying height are joined at the base by a ring of structures used to fulfil public functions. This linkage is repeated at the unusual height of about seventeen stories above the ground. This elevated ring of activity spaces provides a platform for the inclusion of more public leisure facilities such as a gym, library, exhibition space, cafeterias and a jazz night club closer to the potential users. (Domus, 2004)

The massive scale of this residential project successfully integrates public space with private living. The emphasis on combining mixed-use and pedestrian-friendly systems is specifically relevant to the high density context in which the building rests, where the private car is not a significant factor. The landscape and the building interact on a three dimensional level, and maintains the privacy of use for residents in certain areas.

The inclusion of a geothermal heating and cooling system makes the Linked Hybrid one of the largest “green” residential projects in the world and ensures the interior remains comfortable throughout the year.
The Residence at 31 Lower Terrace Road is a 4 bedroom home with connected studio and quadruple garage and is located in the residential suburb of Menlo Park, Pretoria. The structural frame consists of a steel skeleton with brick infill. A combination of plastered and un-plastered brickwork, together with corrugated sheeting and large panels of glazing forms the skin of the building. The corrugated iron roof is attached to steel rafters which are supported by the structural columns at two places at each of the eaves.

The combination of exposed brickwork and glass and steel on the façade creates a surprisingly home-like aesthetic with large north facing windows allowing light to penetrate deep into the building.
Clockwise from top right
Figure 5.35: View of the various skin construction materials
Figure 5.36: View of the balcony from the street showing the roof structure
Figure 5.37: View during construction showing the structural frame and infill
Figure 6.1: Location of site and relevance as an intermediate stop
Design development

The Germinate Concept
The Site
Program
Client
Influence of Guidelines

This chapter illustrates the various factors which influenced the design and outlines the various intentions of the scheme, the purpose it serves and the overall intention. The manner in which the guidelines influenced the final product is also illustrated.
The idea
Germinate is a development which intends to offer an introduction to the unique environment of Salvokop. The development offers a platform from which other interventions can also grow. The simple nature of the scheme supports this foundation. The type of structural systems employed also allow for a future change of use.

The purpose
The purpose of the scheme is to create a reception space for visitors and residents alike. The provision of housing, social facilities and commercial opportunities ensures relevance to both locals and tourists. The nature of the public space works in harmony with the already established pedestrian route and allows for the establishment of edges containing retail and social amenities.
The application

A public space edged by retail opportunities and a coffee shop channels pedestrian traffic towards the rest of the suburb and provides customers for the active building edges. The suburb is built on a considerably more intimate scale when compared to the nearby city centre (to the north) and industrial area (to the west) as is indicated by the contrast in building height.

The Ground floor is almost entirely open to the public, with access controlled only to the crèche and clinic, and at the multi-use space during private events. The first and second floor of the north-most building houses short-term accommodation, whilst the southern building contains rental housing on the upper floors. The free-standing pavilion structure on the Western edge of the site has additional un-programmed open space on the first floor.

Figure 6.2: Vertical and horizontal variation resulting in choice, encouraging ownership and community
Site

The site is situated in the suburb of Salvokop to the south-west of the Pretoria City Centre, on the north-eastern corner of the existing suburb grid. Once the building restrictions (5m on all sides) are accommodated, the site dimensions are approximately 81x54m with a substantially filleted edge on the North-East corner of the site creating a curved boundary. The aforementioned dimensions relate to one another as a ratio of 3:2, which if expressed in a triangle against a 90° corner generate the angles 56° and 34°.
Both the ratio and the sets of angles influenced the design and layout of the site on plan.

Figure 6.3: Proportions of the site
Figure 6.4: Utilised angles of the site on plan

Figure 6.5: Utilised angles of the site on section
Program

Public reception square

The public square on the north-eastern corner of the site acts as a reception space as one enters the suburb. Visitors to the city are often unfamiliar with the overwhelming urban environment. A reception square welcomes and channels users towards points of information whilst providing an introduction to the vibrant and bustling socio-economic climate. Locals can also benefit from the nature of the square as a meeting point for organised as well as unplanned encounters. The nature of the site as a gateway to Salvokop and to the city requires a public area acting as a threshold space.

The surrounding buildings compliment the form and function of the square by creating well-defined edges as well as the opportunity for public activities through the accommodation of shops and social facilities. Landscaping is also appropriately arranged to soften the harsh edges, define the development, and to provide greenery and shading.

Short term housing

Due to the ideal location of the site, in such close proximity to the Pretoria Metrorail and Gautrain stations, as well as to a central bus terminal, an opportunity for short-term accommodation arises. Many users of the city must travel a few hours by bus or train to conduct extra-ordinary business in Pretoria relating to healthcare, business,
finances or important documents. Many of these users are unfamiliar with the city and cannot afford the more conventional hotel style short-term accommodation. The prime location of Salvokop and the provision of short-term rental housing allows these visitors to over-night in one-roomed units for a short duration in order to visit a clinic, collect an ID book, apply for work or other tasks that cannot necessarily be completed in one day.

This accommodation will be managed by a centrally located housing office where applicants can pay to receive an access card before occupying their room. Visits will be limited to a few nights.

The design of the housing also allows for student type accommodation, occupancy of which can be renewed and paid for monthly.

**Permanent rental housing**

The more permanent housing is situated on the southern edge of the site. Once fully occupied, it will provide the threshold population required to sustain the commercial and social facilities. Single bedroom units with a bathroom, kitchen, lounge and dining areas allow for the accommodating of employed semi-professionals, couples or single parents. Units on the first floor also have access to a balcony whilst all units have access to the social areas located on Figure 6.7: Highlighting the need for short-term accommodation close to the city’s amenities
each floor. A pedestrian bridge links the blocks which are separated to allow for public traffic on the ground floor.

Access is controlled through a single entrance and circulation shaft with a fire escape staircase to be utilised in emergencies only.

Commercial/Retail

Approximately ten retail units are provided on the ground floor level, along the edges of the public spaces. Units offer opportunities for small to medium enterprises to settle and begin operating from a fixed location. Double retail units are also available for larger enterprises. These units have full glass frontages with a ceiling height of roughly 4.5m, to encourage public function. The prime location of these units ensures exposure of all tenants to passing pedestrians, thus activating edges of the development focussed more towards tourists visiting Freedom Park and other historical landmarks in the area, with locals on their daily routine travelling to the station or city and home again. A specific unit equivalent to approximately 3 regular retail units has been created and designated as a coffee shop. Its inside and outside seating further energies the public space and makes use of the position’s northern aspect.

Figure 6.8: Illustration of important edges which can be activated to take advantage of pedestrian movement.
Social facilities

Social facilities are provided in the development in order to strengthen the community by providing for urgent needs to be catered for on-site. The clinic in the southern block is accessed directly from the central public space and contains three consulting rooms, as well as a dispensary and an emergency room. The clinic is laid out in such a manner as to allow for ease of access by patients on its northern edge, as well as to provide more secure and private access for management and staff.

The crèche is another social facility proposed for the development, and is located on the ground floor on the southern edge of the main housing block. The more secluded location provides a quieter, more protected environment for the children. Simply portioned play and learning "rooms" flank a central strip of amenities including a kitchen and restrooms, and opens out onto a courtyard which is exclusively for use by the crèche.

A multi-use space is contained on the site's western edge and can accommodate meetings, exhibitions or private functions. Folding doors on the eastern and western edges ensure that the longer sides of the building can be almost entirely displaced to offer the increased permeability especially appropriate for public events.

Public toilets can also be found on site positioned specifically to serve those working and visiting the development.

Figure 6.9: Highlighting the possibility of creating a network between new and existing social facilities in Salvokop
Client

The development will be undertaken for a mixed client consortium. In order to successfully manage the wide range of activities the suggested anchor client for the proposed development is Yeast City Housing (YCH).

YCH was founded in 1998 as a Section 21 (not for profit) Organisation, under the auspices of the Tshwane Leadership Foundation (TLF) and their primary mission is to facilitate the delivery and management of a balanced portfolio of housing stock in Tshwane that meets the requirements of individuals, with an important emphasis on working with communities and understanding their needs. A secondary aim is to empower individuals through healthy economic and social systems.

YCH already has a pilot project in Salvokop namely the Inkululeko Community Centre (Figure 12) which houses a preschool care centre, homework facility, children’s clubs as well as youth and community development forums (Tshwane Leadership Foundation, 2010)

Established initially in August 2000 primarily as a day-care centre, the Inkululeko Community Centre (ICC) has developed...
into a facility which caters for a variety of social needs. Childrens’ clubs provide children with an opportunity to interact and socialise in a safe environment, and other initiatives develop communities through drama and library facilities. The Centre boasts Salvokop’s only swimming pool which is accessible exclusively to the children attending the centre (TLF, 2010). 2005 saw the growth of the centre to include a homework facility for Grade 1-3 learners as well as the provision of extra lessons over weekends for matric candidates. The Centre is an important social development node, also accommodating facilities for community and resident’s meetings. The Korpanong Adult Group also meets at the Centre and provides adults the opportunity to discuss issues regarding parental care and HIV/AIDS (TLF, 2010). The multi-functional facility is an example of a holistic social intervention, one of many that have been initiated by the TLF.

A mixed-use development could further empower the TLF to make an even greater positive impact on the lives of Salvokop inhabitants. Situated approximately 100m north of the ICC, the proposed development could form an important network extension, with the centre in providing important social services, focussed around a variety of housing options.
Design development
Figures 6.18-21: Development of design with site influences
Public space
pedestrian flow

Pedestrian movement is an important design informant in this context. Fast moving pedestrians moving purposefully through the site are accommodated with direct routes across the site. Conversely, users wandering through the development intent on exploring are provided with a variety of options and routes. Many places are also provided for pedestrians to stop and wait, either at the coffee shop or in the shade of one of the many trees.

space heirachy

The inclusion of facilities that span the spectrum of public to private usage requires the inclusion of a variety of spaces and the clear demarcation of the threshold between them. The pergola proposed as an edge around the majority of building faces adds impact to the formation of intermediate spaces between the public and the private. The variety of routes and positioning of open spaces also contribute to the hierarchy of spaces.

Figure 6.22: Visualised pedestrian routes and possible destinations
Figure 6.23: Heirachy of spaces
overflow spaces

Due to the favourable climatic conditions in the region, outdoor spaces on ground floor are included as “outside rooms.” These spaces are positioned to allow for a spill-out from either the retail or social facilities. The central green space is particularly important as an overflow for the multi-use facility located on the western edge of the site. This space could potentially accommodate a gazebo for private (closed) functions or less formal public gatherings.

vegetation

The nature of public spaces require that “breathing spaces” be created within the direct pedestrian flows. Vegetation of varying size is introduced on site to create permeable edges to different spaces. The placement of larger deciduous trees on the northern and western façades in particular also assists in shading the interiors during warm summer afternoons. The trees planted around the central green space provide shade for picnics or public functions.
Influence of guidelines

Once appropriate guidelines have been established and tested against existing precedents they could be applied to a design. Along with requirements and influences imposed by the site, the client and the idea, each guideline influenced the decisions taken in the process of arriving at a final product.

1. Location

The location of Salvokop relative to the city and important transport nodes sets a foundation for a well-positioned development. Residents will easily be able to travel to work in the city and beyond, whilst visitors to the to the city or surrounding area will just as easily be able to visit the development. By locating a mixed-use development in such close proximity to a transport terminal, the chances of establishing successful and sustainable business operations and the formation of a viable community are also increased.

Figure 6.26 Location relative to important points nearby
Opposite page left to right
Figure 6.27: Different densities across the site
Figure 6.28: The various uses incorporated
2. Density

The ideal location of the site requires appropriate and effective use of the land. Previously used as an on-grade parking lot, a medium density mixed use residential development of 90 dwelling units/hectare (du/ha) is proposed (Tonkin, 2008:12). This density appears to be appropriate and will ensure that more users benefit from the site. A higher density was found to be inappropriate and would have required a vastly over-scaled development in comparison to the rest of the suburb which comprises of single storey buildings. Because the site is so strongly disconnected from the Central Business District (CBD) by the railway track virtually no relation with the city centre’s taller buildings can be established.

3. Mixed-use

The inclusion of a range of residential, commercial and social facilities ensures a diversity of services to a broader spectrum of users. For many the development will become home, whilst for others it will become an opportunity to establish a business. The range of social facilities also ensures that the development becomes a place of value to the community, to receive health or child care. The greater the diversity of uses the development offers, the wider the range and sources of support and patronage that become available to it.
4. Long term plan

Many developments of this nature can become obsolete due to an inability to expand or change use. The proposed structural system and the manner of this development’s layout allow the buildings and spaces surrounding it to be extended easily, to be adapted or simply to be disassembled to accommodate new functions or purposes. This ensures that the entire development is part of a long term solution for the area, for as long as the will to maintain its relevance remains.

Figure 6.29: Framework and proposals of surrounding sites

5. Immediate needs

When planning developments that include housing it is important to also address the urgent needs of the community and other potential users of the space. The provision of short term housing as well as social facilities such as the crèche and clinic, provides individuals with the essential basic facilities, whilst adding a meeting space and an area for private functions accommodates the needs of the broader community. Public open spaces throughout the proposed development also encourage less formal, but equally necessary use of the site.
6. Communities

The formation of communities cannot be forced, but should rather be provided for. The generous allowance of public space for both commuting pedestrians and less energetic users enables chance encounters and other rendezvous. A coffee shop which overlooks the public square offers locals and visitors a warm reception when returning from or en route to the city. More private spaces intended for use by residents of both blocks create opportunities for social interaction and the formation of stronger communities.

Figure 6.30: Communal spaces
Figure 6.31: Pedestrian routes

7. Pedestrian

Due to the main and most direct connection to the city being the pedestrian bridge, as well as the predominately car-less nature of the suburb, pedestrian travellers must become the priority. The preservation and formalisation of the previously existing footpath, combined with the activation of the edge condition of buildings overlooking the main flow ensures a direct and pleasant experience for all traversing the site on foot. A variety of options and a hierarchy of routes allows a dynamic experience for users, providing an opportunity to decide on a course when en route to their destination or simply exploring.
Technical Resolution

Structural systems
Sustainability
Material overview
Materials

The argument related to technical choices made within the architectural solution. The materials and systems employed with the structure are discussed.
Structural systems

Concrete vs Steel

Concrete and steel were both considered for the structural frame of the buildings, and although concrete is a more cost-effective choice, steel was selected because it is able to span longer distance and can be disassembled and re-used. Steel also matched the intended aesthetic for the development with its lightweight.

The nature of the separate components (pergolas and roofs) which are attached to the main structure require steel fittings, and although these could also be fixed to a concrete beam or column, the same versatility would not be available, should these fittings have to be removed, extended or adjusted. The challenge of meeting the required fire resistance standards could be solved by the application of intumescent paint to exposed structural steel elements.

Table 7.1: Advantages of using a concrete structure vs steel frame
Figure 7.2: Design Features graphic
Sustainability

The Sustainable building assessment tool (SBAT) as developed by the CSIR was applied to the design in order to measure the impact on the environment. Application of the tool showed strengths in the social area - particularly in the fields of occupant comfort and access to facilities. This is due largely to the development’s central location and its nature as a primarily housing scheme.

Lower scores were recorded in the environmental section showing that the more attention could be given to the development of a recycling system as well as the installation of alternative energy harvesting sources. A retrofitting of these systems is possible and could drastically increase scores in this section. These considerations were initially not applied due to restrictions in budget.

Overall the scheme is classified as GOOD. This supports the aim of establishing a well-blanced development which supports the community. (See Addendum A for full tool).

| Social       | 3.7 |
| Economic    | 3.5 |
| Environmental| 2.8 |
| Overall     | 3.3 |

Classification: GOOD

Figure 7.3: SBAT graph
Material overview

Figure 7.4: Material composition
Materials

Building Skin

For the infill, a combination of white plastered masonry and a red “Country Classic” style face-brick from the Satin Corobrick range was selected. Both materials are represented in many of the existing free-standing dwellings in the area. The natural red or tan colour of the exposed soil in the region also influenced the selection of colour of face-brick for the Freedom Park development and in this case is also a contributing factor in the choice made.
Clockwise from top right

Figure 7.7: Map showing the red/tan colour of exposed earth
Illustration 7.8: View of the Freedom Park building
Illustration 7.9: Typical Salvokop residence with facebrick and plaster combination finish

Opposite page
Illustration 7.5: Plastered wall finished with white paint
Illustration 7.6: Country Classic Satin FBS

Architecture - Housing - South Africa - Sustainability - Community
Precast slabs vs cast-in-situ

For a floor slab a conventional reinforced slab was deemed unfeasible due to the larger span distances between the supports of the steel frame. A precast concrete slab with a steel reinforced screed topping and a composite cast-in-situ slab with permanent galvanised steel formwork were the two plausible options explored.

In this specific application the composite concrete decking proved more appropriate.

Although not offering the same long-term flexibility, versatility or aesthetic appeal as the pre-cast slabs, the composite slab proved more cost effective and easier to assemble due to the elimination of a need for building cranes. The more accommodating nature of the slab regarding wired services allowed for the elimination of a suspended ceiling. Compatibility of connection with steel was also a considerable positive factor since the galvanised formwork could be easily attached to the steel beams. This connection would be far more complicated and expensive in the case of precast concrete.

Table 7.10: Advantages of using pre-cast concrete slabs vs composite concrete slabs with permanent formwork
The intermediate edges created by the timber pergola along the edges of the building were important for the design in that they were required to create thresholds between the open public spaces and the solid mass of these buildings.

A Forest Stewardship Council-approved (FSC) South African sustainable hardwood (Saligna), treated with VOC-Compliant water-based nano-particle wood preservative was selected for the pergola. The timber is mechanically attached to the building columns with a bolt system and supported by steel columns to those of the buildings, to create a boulevard. Amenity lighting, installed on ground level to accentuate the vertical elements, completes the component.

The deep beams ensure stability and block out uncomfortable early morning and late afternoon sunlight, whilst allowing an otherwise well lit, refreshing environment. The high volume ensures summer sun is largely blocked whilst winter sun is allowed to fall deep into the ground floor facilities.
Units

The southern block of the development consists mainly of economically sized 1 bedroom and two bedroom units. A single bachelor unit can also be found on each level.

Some of these units are slightly bigger and can accommodate an extra bed or study nook. Each bedroom can accommodate a double bed or twin beds and is fitted with floor to ceiling cupboards. Additional storage space as allowed for in the entrance area. Bathrooms contain a standard on-counter hand wash-basin, a toilet and bath. A full oven and stove as well as a washing basin are installed amongst standard veneered kitchen counter tops with storage space below counter and overhead where appropriate. Lounges can accommodate one or two couches as well as four bar-stools allowing the kitchen counter to double as a breakfast table.

The intent behind the unit design is to provide comfortable spaces which are feasible in the bigger picture of the entire development. Emphasis was placed primarily on the four spaces that are considered as communal (entrance, kitchen, lounge and balcony) and are therefore arranged accordingly. Units are placed with bedrooms and lounges facing towards north wherever possible, unless where this coincided with the public walk-way in which case privacy was prioratised.

1 Bedroom unit
31-39m²
1-3 people
34 units
2 Bedroom unit
47m²
2-5 people
8 units
Bachelor unit
26m²
1-2 people
2 total units
Short-term unit
6.3m²
1 person
48 units
Typical unit

Figure 7.14: Bird’s eye perspective view of a typical 1 bedroom unit
“Design is about giving order, scale, and beauty to the buildings and the space between them.”

Richard Rogers
Drawings

Sketch plans
Sections
Details
Elevations
Perspectives

Reduced representations of relevant 2D and 3D drawings which present the building design and the spaces created as a result, details of connections etc.
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Germinate - Architecture of Growth
Amenity lighting 3x1Watt LED highlighting column in aluminium casing closed with 6mm thick tempered glass woven fabric weedguard

Remove topsoil and compact soil in layers of 150mm to a density of at least 90% MOD AASHTO

203x133x25 mild steel I-Beam finished with waterbased anti-corrosion paint

Mild steel balustrade with SA Sustainable Hardwood (Saligna) handrail and finished with anti-corrosion waterbased coating and bolted to beam

76x200 South African Sustainable hardwood (Saligna) finished with polywax sealant, bolted to supporting structure

203x133x25 mild steel I-Beam finished with waterbased intumescant paint and colour specific enamel
Precast concrete lintel reinforced with mild steel for lengths in excess of 1.2m, plastered on all interior surfaces.

5mm thick Class II interior plaster

100% Stainproof Miracle Fibre (Polypropylene) VOC tested and approved (GBCSA standard) heavy duty residential carpet

25mm fine aggregate topping screed

QC decking concrete cast in interlocking channels of 320x54x0.8mm galvanised steel, fixed to beams with pop-rivets.

203x133x35 mild steel I-Beam finished with waterbased intumescent paint and colour specific enamel

fibre cement ceiling boards suspended on mild steel hangers fixed to overhead beams

203x133x25 mild steel I-beam finished with waterbased intumescent paint and colour specific enamel

10mm thick closed cell polyethylene foam strip fixed to beam with epoxy and gap closed with Poly-sulfide sealant to accommodate expansion

152x152x37 mild steel H section coated with water-based intumescent paint and colour specific enamel

5mm thick Class II interior plaster

100% Stainproof Miracle Fibre (Polypropylene) VOC tested and approved (GBCSA standard) heavy duty residential carpet

25mm fine aggregate topping screed

QC decking concrete cast in interlocking channels of 320x54x0.8mm galvanised steel, fixed to beams with pop-rivets.

203x133x35 mild steel I-Beam finished with waterbased intumescent paint and colour specific enamel

fibre cement ceiling boards suspended on mild steel hangers fixed to overhead beams

203x133x25 mild steel I-beam finished with waterbased intumescent paint and colour specific enamel

10mm thick closed cell polyethylene foam strip fixed to beam with epoxy and gap closed with Poly-sulfide sealant to accommodate expansion

152x152x37 mild steel H section coated with water-based intumescent paint and colour specific enamel

5mm recess drip

63x4mm mild steel circular hollow section coated with water-based anti-corrosion paint and colour specific enamel welded at ends to custom plate and bolted to support

M18 mild steel bolt

custom cut mild steel section, welded to column

5mm thick closed cell polyethylene strips along outside perimeter of window frame to insulate connection and accommodate expansion

1.6mm thick mild steel window frames fitted with laminated glass complying to SANS 10-400 Part N
132mm equal sided mild steel angle section finished with water based anti-corrosion paint and fixed with lap joint weld

15° Galvanised steel Shading roofs with a 1370mm overhang

0.50 mm - ISQ550 Z275 Galvanised steel IBR sheeting coated with Chromadek

60x30 mild steel channel finished with waterbased anti-corrosion paint and fixed to beam with lap weld joint

100x80 mild steel I beam finished with waterbased anti-corrosion paint

butt joint welded connection

12mm thick mild steel plate finished with water based anti-corrosion paint

12mm thick mild steel plate finished with water based anti-corrosion paint, lbutt welded to I-beam and bolted with M12 bolts to H-column

6mm L-shaped mild steel section finished with waterbased anti-corrosion paint, welded to H-column and bolted with M12 bolts to I-beam

facebrick infill

NORTH ELEVATION
20mm topping screed with 20mm overhang on either side

topsoil to minimum depth of 200mm

expanded metal mesh welded to steel beam bent to fit into mortar gap between bricks providing stability

305x165x54 mild steel I-Beam finished with waterbased intumescent paint and colour specific enamel

80mm layer of light coloured, smooth non-absorbent natural stones of 15mm nominal size
double layer of Polymer modified bitumen membrane waterproofing on 40mm minimum thickness screed to fall minimum 1:40 and covered with a geocomposite drainage layer of minimum density of 210g/m²

Stainless steel rain water outlet

80mm Ø HDPE drainage pipe cast into concrete slab at minimum fall of 1:80
Cellulose loose fill thermal insulation material treated with fire retardant chemical laid to a depth of min 100mm

120x55x12.5 mild steel PFC coated with water-based intumescent paint and colour specific enamel bolted to supporting column with L-shape 10mm thick steel plate

250 long strip of expanded steel mesh bent into L shape and welded to underside of steel roof beam and cast into mortar of brickwall to provide stability.

6mm thick fibre-cement ceiling board nailed to 115x50 timber branderings with 35x4mm diameter galvanised serrated ceiling nails at 150mm centres

1mm IBR hot-dip galvanised mild steel roof sheeting fixed to purlins with 6mm diameter 65mm galvanised steel roof screws with galvanised steel and neoprene flanged washers

50x75 timber purlins at max spacing of 1200mm nailed to timber rafter

200x150 deep 0.8mm thick continuous hot-dip zinc-coated carbon steel sheet gutter laid at 1:500 fall onto 40x5 galvanised mild steel brackets which are fixed to timber roof purlins at max 1000mm centres

15mm flat pressed fibre-cement fascia board drilled and fastened with countersunk 5mm diameter x 50mm cadmium plated screws at max 750mm centres

10mm thick flat unpressed fibre-cement eaves enclosure nailed to 50x50 timber branderings which are nailed to timber rafters

DETAIL G

BRIDGE ARRIVAL ELEVATION
Illustration 8.1-2 Computer rendered perspectives of the exterior

VIEW OF RETAIL EDGE

COFFEE SHOP AND SQUARE

WEST ELEVATION
Germinate - Architecture of Growth
BALCONIES AND ROOFS ON THE NORTHERN FACADE

INTERIOR PERSPECTIVE OF A LIVING UNIT

Opposite page
Illustration 8.3 Computer rendered perspective of the exterior
Top to bottom
Illustration 8.4 Computer rendered perspective of the exterior
Illustration 8.5-6 Computer rendered perspectives of a one bedroom living unit
LIVING UNIT WITH BALCONY

Illustration 8.7 Computer rendered perspective of a one bedroom living unit from the north
Illustration 8.8-12 Photographs of the final model
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Addendum A - SBAT rating tool

SUSTAINABLE BUILDING ASSESSMENT TOOL (SBAT-P)

Project title: Germinate: Architecture of Growth    Date: October 2011
Location: c/o Skietpoort Avenue and Koch Street    Undertaken by: Author
Building type: Mixed-use residential

Social: 3.7
Economic: 3.5
Environmental: 2.8
Overall: 3.3

Classification: GOOD
## Building Performance - Economic

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<th>Measured Points</th>
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<td>EC 1.1</td>
<td>Local contractors % value of the building constructed by local (within 50km) small (employees&lt;20) contractors</td>
<td>90 0.9</td>
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<td>EC 1.2</td>
<td>Local materials % of materials used (local, bricks, blocks, roofing material) sourced from within 50km</td>
<td>100 1.0</td>
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<td>EC 1.3</td>
<td>Local components % of components (windows, doors etc) made locally (within 50km)</td>
<td>100 1.0</td>
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<tr>
<td>EC 1.4</td>
<td>Local furniture % of furniture and fittings made locally (in the country)</td>
<td>100 1.0</td>
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<tr>
<td>EC 1.5</td>
<td>Maintenance % of maintenance and repairs by value that can, and are undertaken, by local contractors (within 50km)</td>
<td>100 1.0</td>
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## Building Performance - Social

### Building Performance - Economic

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<td>EC 3.1</td>
<td>Adaptability % of spaces that have a floor to ceiling height of 3000mm or more</td>
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<td>EC 3.2</td>
<td>Inclusive Environments Design facilitates flexible external space use (100%)</td>
<td>70 0.7</td>
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<td>EC 3.3</td>
<td>Inclusive Environments Non-loudering internal partitions that can be easily adapted (close performing) (100%)</td>
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<td>EC 3.4</td>
<td>Modular planning Building with modular structure, envelope (renovation) &amp; services allowing easy internal adaptation (100%)</td>
<td>100 1.0</td>
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<td>EC 3.5</td>
<td>Furniture Modular, limited safety furniture – can be easily configured for different users (100%)</td>
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<tr>
<td>EC 4.1</td>
<td>Induction % of users exposed on a monthly basis to building performance figures (water, electricity, energy) (100%)</td>
<td>75 0.75</td>
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<td>EC 4.2</td>
<td>Procurement % of value of all materials/equipment used in the building on a daily basis supplied by local (within the country) manufacturers (100%)</td>
<td>75 0.75</td>
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## Building Performance - Social

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<td>EC 5.1</td>
<td>Local need % of space/area meeting training on building systems (10%). Detailed building user manual (100%)</td>
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<td>EC 5.2</td>
<td>Procurement Tender / construction packaged to ensure involvement of small local contractors/manufacturers (100%)</td>
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<td>EC 5.3</td>
<td>Building costs Capital cost not more than 25% above average building costs for the building type (100%)</td>
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<td>EC 5.4</td>
<td>Sustainable % of or more of costs allocated to new sustainable/independent technology (100%)</td>
<td>30 0.3</td>
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<td>EC 5.5</td>
<td>Existing Buildings Existing buildings reused (100%)</td>
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<td>Water use % of water consumed sourced from rainwater harvested on site</td>
<td>80 0.8</td>
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<tr>
<td>EC 1.2</td>
<td>Water use % of equipment (park, washing machines, urinals, showers) that are water efficient</td>
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<tr>
<td>EC 1.3</td>
<td>Water use % of carpeting, patiles, and roads that have absorbent/sustainable surfaces (grassed/drainage/loosened)</td>
<td>20 0.2</td>
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<tr>
<td>EC 1.4</td>
<td>Greymeater % of waste from washing/dishwashing processes recycled and reused</td>
<td>40 0.4</td>
</tr>
<tr>
<td>EC 1.5</td>
<td>Planting % of planting (other than food gardens) on site with appropriate water requirements</td>
<td>65 0.65</td>
</tr>
</tbody>
</table>

### Score and Rank

<table>
<thead>
<tr>
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## Building Performance - Social

### Building Performance - Economic

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Indicative performance measure</th>
<th>Measured Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>EC 6.1</td>
<td>Waste % of toxic waste (batteries, ink cartridges, fluorescent lamps) recycled</td>
<td>70 0.7</td>
</tr>
<tr>
<td>EC 6.2</td>
<td>Organic waste % of organic waste recycled</td>
<td>0 0</td>
</tr>
<tr>
<td>EC 6.3</td>
<td>Inorganic waste % of inorganic waste recycled</td>
<td>0 0</td>
</tr>
<tr>
<td>EC 6.4</td>
<td>Sewage % of sewage recycled on site</td>
<td>0 0</td>
</tr>
<tr>
<td>EC 6.5</td>
<td>Construction waste % of damaged building materials / waste developed in construction recycled on site</td>
<td>0 0</td>
</tr>
</tbody>
</table>

### Score and Rank

<table>
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## Building Performance - Environmental

### Building Performance - Economic

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<tr>
<th>Criteria</th>
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<th>Measured Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>EC 1.1</td>
<td>Space % of proposed site already disturbed / flattened (previously developed)</td>
<td>0 0</td>
</tr>
<tr>
<td>EC 1.2</td>
<td>Neighbouring buildings % of buildings negatively affected (access to sunlight, daylight, ventilation) (100%)</td>
<td>100 1.0</td>
</tr>
<tr>
<td>EC 1.3</td>
<td>Vegetation % of area of area covered in vegetation (include green roofs, internal planting) whole to whole</td>
<td>90 0.9</td>
</tr>
<tr>
<td>EC 1.4</td>
<td>Food gardens Food gardens on site (100%)</td>
<td>100 1.0</td>
</tr>
<tr>
<td>EC 1.5</td>
<td>Landscape % of landscape that does not require mechanical equipment (e.g. lawn cutting) and or artificial inputs such as weedkillers and pesticides</td>
<td>0 0</td>
</tr>
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## Building Performance - Social

### Building Performance - Economic

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<tbody>
<tr>
<td>EC 1.1</td>
<td>Embodied energy Materials with high embodied energy (aluminum/plastics) make up less than 1% of weight of building (100%)</td>
<td>100 1.0</td>
</tr>
<tr>
<td>EC 1.2</td>
<td>Material sources % of materials and components by volume from green sources (animal/plant)</td>
<td>20 0.2</td>
</tr>
<tr>
<td>EC 1.3</td>
<td>Material depletion No materials and components used requiring some depleting processes (100%)</td>
<td>100 1.0</td>
</tr>
<tr>
<td>EC 1.4</td>
<td>Recycling / reuse % of materials and components (by weight) reused / from recycled sources</td>
<td>0 0</td>
</tr>
<tr>
<td>EC 1.5</td>
<td>Construction volume % of square meterage/area of new building (100%)</td>
<td>100 1.0</td>
</tr>
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</table>
Addendum B - Horizontal textures

Informal

Formal

Illustrations 2.32-39: Site photos by Author
Circulation is the fundamental informant for the condition of the vertical surfaces. Along routes where pedestrians are expected wide boulevards equipped with street furniture are empty, whilst the informal paths (often the shortest route available) where people do walk are bustling with activity and small stalls selling fruits and sweets.

The informal surfaces include (clockwise direction) loose gravel, old pavers, compressed sand and unkept grass. These surfaces (with the exception of the grass) are most frequently used by pedestrians travelling to and from the station. These surfaces are not maintained and evolve over time.

The formalised surfaces include (clockwise direction) gravel for parking, smaller and larger concrete pavers and asphalt for the roadway. These surfaces are considered formal due to their intentional nature. They are preserved through maintenance and the intention is for them not to change over time.

The formal surfaces are generally not appropriately located and are not therefore not used as intended whilst the informal surfaces are created due to the informal circulation of pedestrians.

Any development, as proposed in this dissertation, should respond appropriately to the nature of the vertical surfaces. Informal areas that experience high levels of traffic could be developed and encouraged through the establishment of appropriate paving surfaces. The quality of the experience as seen from the user on a small scale should also be considered.
Acknowledgements

Tasha, for always believing in me
Mama & Papa, for your unrestricted support
Loni, for your prayer and encouragement
Katy, for your reassuring and graphical input
and Christopher, for your valuable linguistic recommendations