The Dynamite Press

A Publishing House and Book Village in a Historical and Industrial Precinct (Modderfontein) in northeast Johannesburg

Janice Davey

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by Janice Davey

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: Prof Karel Bakker
Course Co-ordinator: Dr Jacques Laubscher, Dr Arthur Barker

Pretoria
2012

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Project Summary

Programme:	A Book Village with the following: a publishing house facilitating small conferences/ presentations, and book launching events, a bookstore, a restaurant, and residential units.
Site Description:	A precinct which is relatively unknown and is currently undergoing upgrading. Modderfontein is 20km northeast of the Johannesburg CBD.
Client:	Private Company
Users:	Corporate Companies, Individuals
Site Location:	Corner of Main Street and Christies Hill, Modderfontein
GPS Coordinates:	-26.094227 Latitude 28.162380 Longitude
Elevation:	1680m above sea level
Architectural Theoretical Premise:	Dealing with heritage, nature, the site, cultural landscapes
Architectural Approach:	Contextual, Sensitive to the heritage of the area
Research Field:	Heritage and Cultural Landscapes

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

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

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

Janice Davey

Table of Contents

Figure 1 (Author 2012)

00 Preface

Figure 2 (Author 2012)

Abstract

The study has investigated a design intervention to the historically significant industrial precinct of Modderfontein. Modderfontein contains the first dynamite explosives factory in South Africa and is situated 20km northeast of Johannesburg. The area and its old buildings are relatively unknown. Due to the introduction of the Gautrain and the proposed development of the Modderfontein station and surrounds, the area will be densified and become more accessible.

The intention of the framework proposed by the author is to activate the Main Street which contains the First Factory Manager's house and the Dynamite Company Museum. This would be achieved by densifying the village with a series of buildings in clusters that have public, office and residential components.

It is proposed that one of the clusters becomes a Book Village. The proposal will adhere to the various guidelines in a sensitive, contemporary manner.

01 Introduction

Figure 3 (Author 2012)

1.1 Real World Problem

The area of study is Modderfontein, 20km northeast of the Johannesburg CBD. Modderfontein contains the first Dynamite Factory in South Africa built in 1896. Subsequently a village developed.

The current village contains some of the original buildings from the 1890s. Many of them have corrugated iron walls and roofs. Most of the factory workers and artisans were immigrants from Europe.

In the future Modderfontein will be densified and become built up due to its prime position near Johannesburg. There is a proposed Gautrain station and the development of a retail town surrounding the Gautrain station to the west of the historical village. The historical village has been zoned as an office park in the Spatial Development Framework from Heartland. Heartland Properties manages the development of the Modderfontein Precinct. There is a danger that the quaintness and serenity of the heritage village may be lost.

A development strategy for the Heritage Precinct which is more detailed than the existing Heartland Spatial Framework has been proposed by the author. Within this strategy, a contextually appropriate architectural response is explored.

Figure 4 Housing Developments outside Modderfontein (Author 2012)

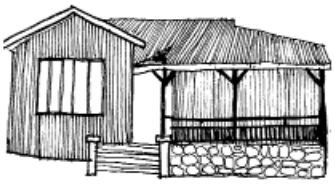


Figure 5 Existing older buildings in Modderfontein (Author 2012)

Figure 6 Housing Developments outside Modderfontein (Author 2012)

Figure 7 Residential Developments in Modderfontein (Author 2012)

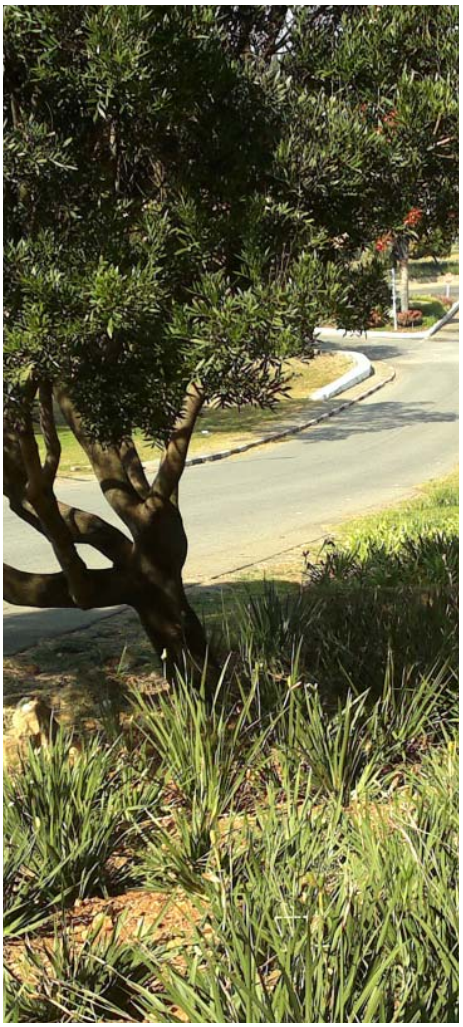


Figure 8 Green areas and a Tarwood tree to the south of the Franz Hoenig Haus (Author 2012)

1.2 Site

The site chosen is located near the Franz Hoenig Haus, which is at the heart of the historical village of Modderfontein. Current access to the village is via road from Modderfontein Road. In the future a proposed Gautrain station to the west of the village will allow better accessibility to the area.

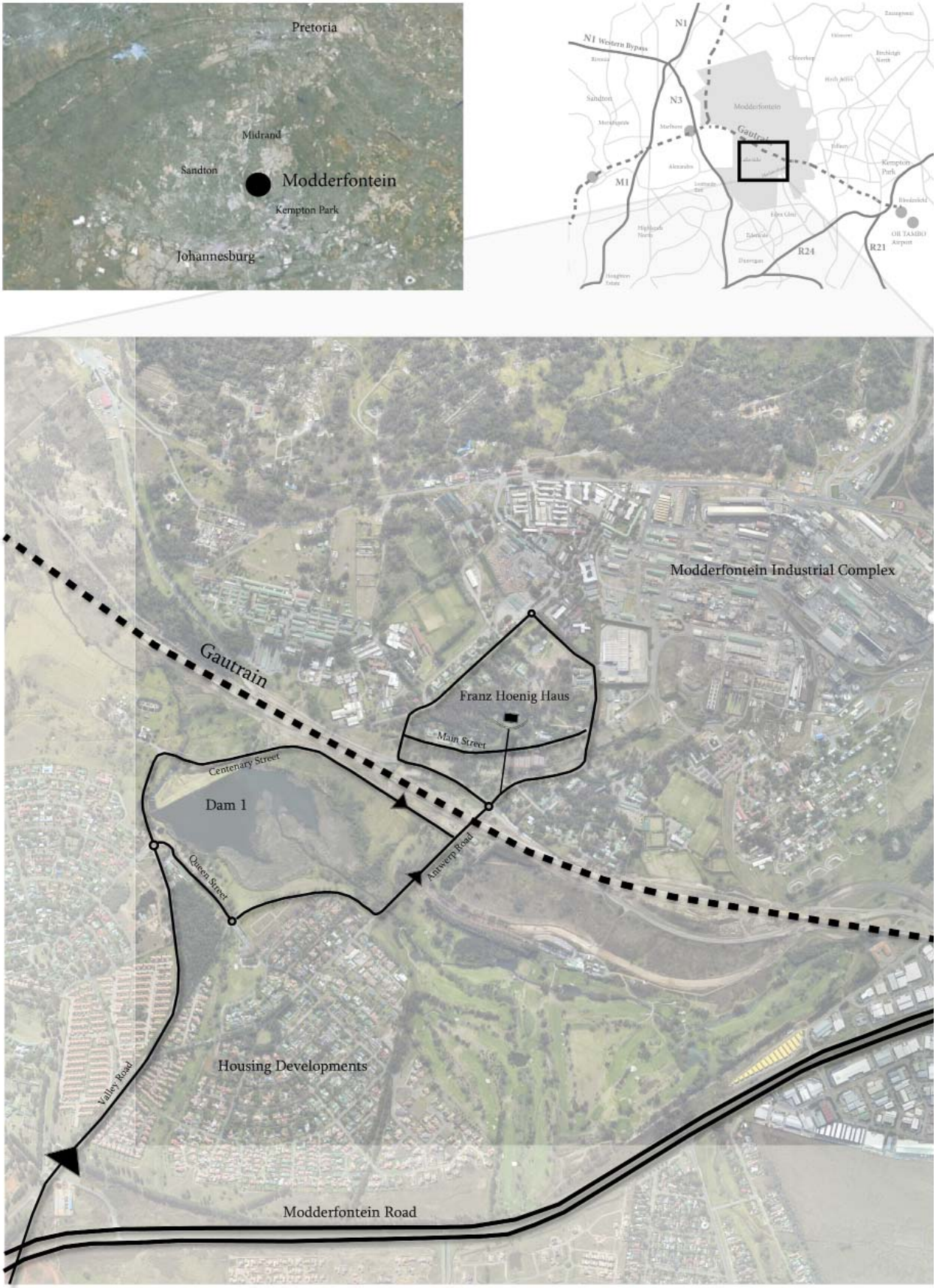


Figure 9 (Image by author and aerial photograph from the City of Johannesburg)

1.2 Framework Objectives

Within the Spatial Development Framework by Heartland Properties, the village is assigned as an Office Park with a residential and mixed-use component (Heritage Impact Assessment by R Bosman 2010) (see Context Chapter). The area of study is the open grass land to the south of Franz Hoenig Haus (see image on the right). The framework by the author describes an activation of Main Street which contains various significant heritage buildings including The Dynamite Company Museum, 33 High Street Restaurant and the Franz Hoenig Haus. This would be done by a series of buildings in the open land which has a public interface with Main Street. These buildings would follow various guidelines set in existing frameworks (such as the Heritage Impact Assesssment) and the author's framework for the village.

Figure 10 Diagram showing the activation of Main Street (Author 2012)

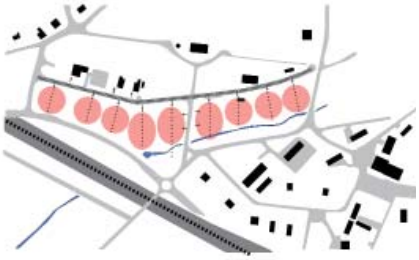


Figure 11 Diagram showing clusters of buildings leading onto and from Main Street (Author 2012)

Figure 12 Green areas and trees to the south of the Franz Hoenig Haus (Author 2012)

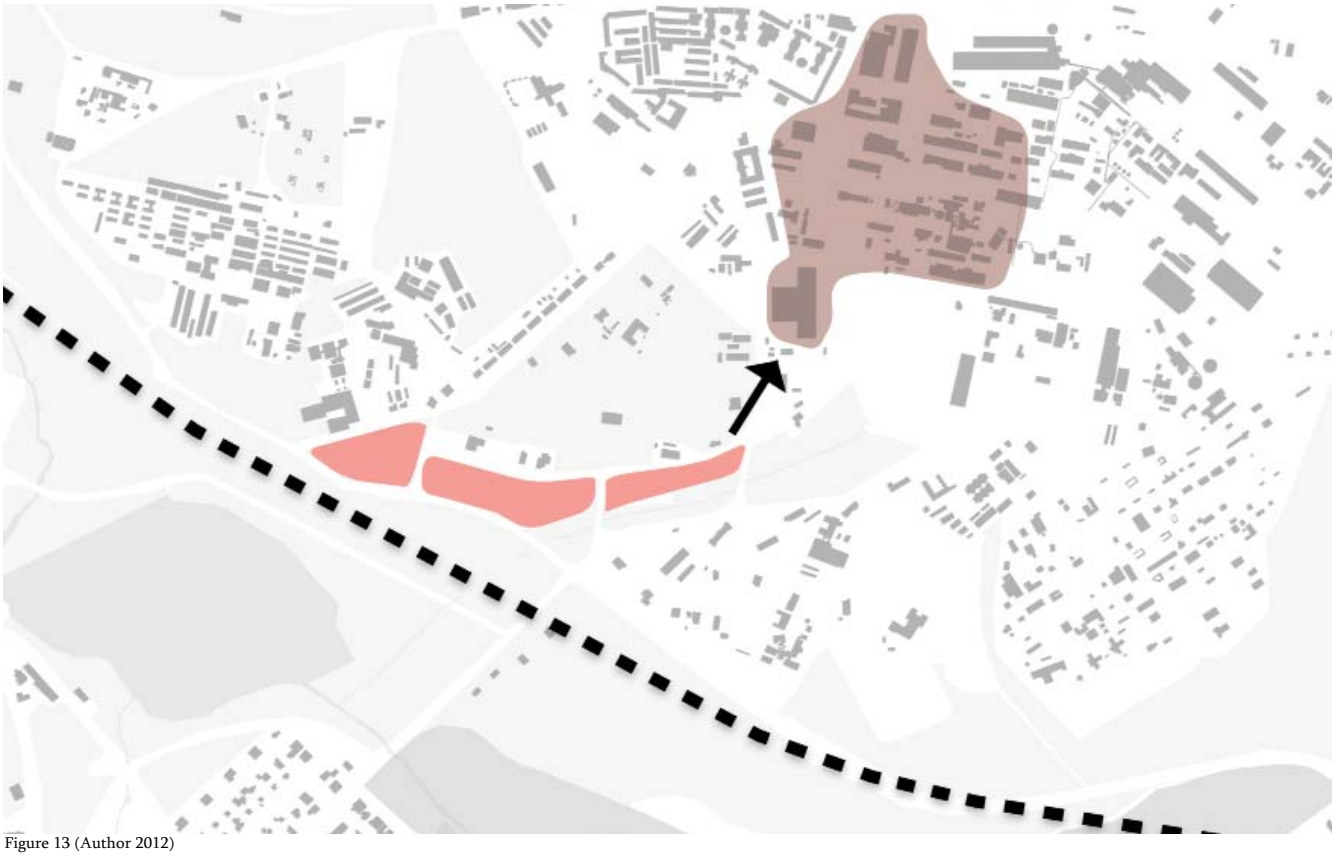


Figure 13 (Author 2012)

1.3 An area of Production and Mixed-use

The author proposes that the area south of the Franz Hoenig Haus becomes a zone of production of services and mixed-use, whilst the actual manufacturing of products occurs in the Industrial Complex (where the Dynamite Factory is situated) which contains large warehouses, heavy machinery and train lines for the transportation of bulk products (see Figure above).

Figure 14 showing the Industrial complex at Modderfontein (Photograph from www.explosives.co.za)

1.3 Site chosen for Building Intervention

The site chosen lies on the corner of Main Street and Christie's Hill in the Heritage Village. The site lies on the axis line which runs North-East to South-West from the Franz Hoenig Haus. The site currently contains planted (kikuyu) grass, large Eucalyptus trees (planted in the 1890s), Acacia Melanoxylon trees and a Tarwood tree. The site is clearly visible by passengers travelling on the Gautrain.

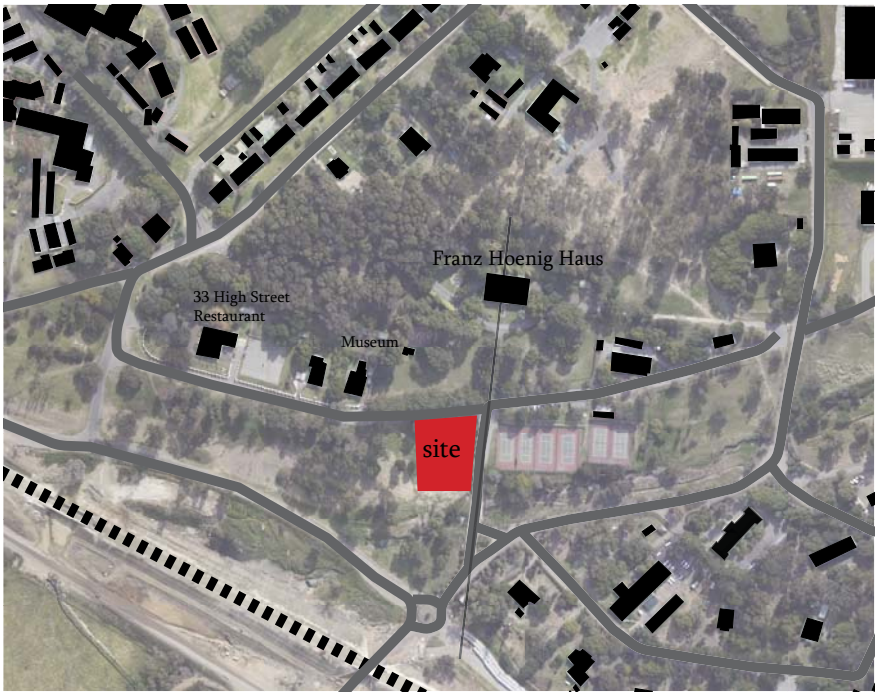


Figure 15 showing the site chosen in relation to the Franz Hoenig Haus (Image by author and the City of Johannesburg)

Figure 16 showing large Eucalyptus trees on the site selected (Author 2012)

Figure 17 Image showing the main axis to the Franz Hoenig Haus, with the site selected in darker colours (Author 2012)

1.3 Client

The clients of the proposed project consist of several private companies. The clients consist of a restaurant business called 'Franz's Kitchen', a book-store 'Dynamite Books', a publishing house 'The Dynamite Press' and 'Christies Hill' residential Units.

1.4 Programme

The area calls for an intervention that will work in conjunction with the Gautrain (and the proposed Gautrain station at Modderfontein), the landscape and the heritage of the area. The proposed programme is a 'Book Village' with a small publishing house. The idea is of establishing a place of events, such as small conferences, book launching, that, together with the existing restaurant and other future buildings will bring public interest to the village. The building will form part of a pedestrian heritage walk (see Context Chapter). The project will have public and social areas (restaurant, bookstore, book-launches and parties), open plan offices and residential units. Currently publishing houses in South Africa outsource the actual printing of the books elsewhere. It is proposed that the printing of paper books occurs in the Modderfontein Industrial Complex where there is adequate infrastructure.

1.5 Hypothesis/ Aim

The aim of the project is to densify the village in a manner which respects the existing culturally significant green areas and trees (see Context Chapter). The project should also be sensitive to the existing heritage buildings, meaning that the new buildings should not dominate the landscape in scale and height. The historical 19th-century buildings in the village are small with pitched corrugated iron roofs, intricate and detailed. However, the new buildings should stand in contrast to the older buildings by being built in a contemporary style, to create historical clarity to the visitor and for future generations.

As the area is zoned as an office park, the nature of the proposed project will have offices. The proposed project will use the guidelines stated in the Heritage Impact Assessment and generate a suitable contemporary solution.

1.6 Sub-problems

The context of the design proposal is in a South Africa where there is a significant emergence of seminal fiction and nonfiction authors. There is a need for a place where editing, designing, publishing, selling, meeting, book launching, electronic books, graphic design and web page design are juxtaposed in an inspiring environment. Authors, editors, publishers can meet and debate about South African literature in this kind of space.

The Boekehuis, a famous bookstore was closed in Johannesburg at the beginning of 2012. There was an uproar by many well-known authors in the country. The bookstore hosted many speakers and book-launches. As mentioned in an open letter posted in the Mail and Guardian, "There are no comparable forums in Johannesburg, and the loss of Boekehuis is a blow against the culture of reading and debate, which is so crucial to the well-being of our democracy, particularly given the steady erosion of book culture in South Africa."

The design problem revolves around creating an environment which respects its site, its context and which encourages the growth of the literary culture in the country.

Figure 18 showing existing businesses along High Street in Modderfontein. These include scanning, auditing, photography, rural sales, pharmaceutical, audio, a museum, a restaurant and a pre-school. (Author 2012)

Figure 19 showing the interior of the Boekehuis (image from http://todoinjoburg.co.za/2011/12/save-the-boekehuis-book-shop/)

Figure 20 showing books and a cafe at the Boekehuis (image from http://www.beeld.com/Suid-Afrika/Nuus/Boekehuis-se-sluiting-is-tragies-20111206)

1.7 Research Methodology

Visits to existing publishing houses were required as well as research into the existing publishing industry for the project. An extensive study of the Modderfontein site was done.

1.7.1 Site Analysis and Urban Mapping

The Modderfontein Precinct was analysed in terms of transport routes to the area, and the types of existing infrastructure and services. The existing buildings were examined in terms of their age and what their purpose was, and is.

1.7.2 Archive Documents

A book written by Alan Cartwright in 1964, called 'The Dynamite Company: The story of African Explosives and Chemical Industries Limited', explains and gives an overview of how Modderfontein was established and the impact of the explosives and chemical industry in South Africa. The book also looks at the discovery of dynamite, the process of manufacturing dynamite and its subsequent forms.

1.7.3 Museum

The Dynamite Company Museum was visited, which contains original machinery used in the 1890s for the Dynamite Factory, as well as explaining the process of making explosives. The Museum also shows images of the village in its early days. The Dynamite Company Museum and the Franz Hoenig Haus are linked. The Franz Hoenig Haus, the house of the first factory manager, contains old furniture and now hosts seminars, conferences and meetings.

Figure 21 showing the gardens and the wagon shed by the Franz Hoenig Haus (Author 2012)

Figure 22 showing the veranda of the Franz Hoenig Haus with concrete columns instead of the original timber (Author 2012)

Figure 23 showing an interior view of the Franz Hoenig Haus. The house is dark inside and requires artificial lighting during the day (Author 2012)

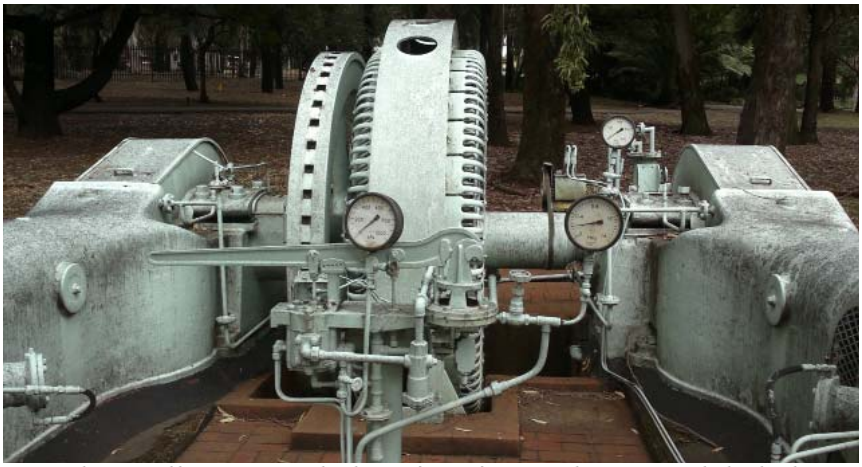


Figure 24 showing an old air compressor used in the manufacture of Dynamite. This compressor is displayed in the gardens of the Dynamite Company Museum (Author 2012)

Figure 25 showing a lamp-post in the gardens of the Franz Hoenig Haus (Author 2012)

Figure 26 (Author 2012)

02 History

Figure 27 (Author 2012)

2.1 History of the Dynamite Company and the Modderfontein Village

> "But none were more homesick and unhappy than a group of German carpenters and masons who arrived early in the year. They had left their homes in Hamburg six weeks earlier. They had made the long sea voyage to Cape Town and on to Durban. They had endured the intolerable heat of the tropics and the Natal Coast, clad in the heavy garments of the German workman of the day. They had come what seemed an interminable journey on the newly opened railway line from Durban to Pretoria… From Pretoria they had been sent by train to the little siding of Zuurfontein [Kempton park] and there had unloaded their kitbags and tool chests and looked around expectantly. For this was the end of their long journey. Near this siding lay the site of the great factory they had come to build." (Cartwright 1964: 1)

The Modderfontein Dynamite Factory was "to be one of the biggest explosive factories in the world" (Cartwright 1964: 3). The factory was built in 1896 due to the high demand of explosives for the mines of the Witwatersrand.

> "There was no one at the station to meet them. The train pulled out leaving them standing on the platform. All around them, as far as the eye could see, there stretched a vast, undulating expanse of veld. There were no mountains, no trees, no smoke from chimneys. The only signs of human habitation were a farmhouse and, in the far distance, a small black boy herding some cattle." (Cartwright 1964: 2)

Gold in South Africa was initially mined from outcrops near the surface, but later it was discovered that there was gold found in deep-level mining. This deep-level mining requires explosives, of the nature that Alfred Nobel patented with nitroglycerine, called 'Dynamite', 'Blasting Gelatine' and 'Gelignite'.

Figure 28 showing the Franz Hoenig Haus. The house was built for the first factory manager in 1896 and is now a historic house museum (Author 2012)

Figure 29 showing the interior of Franz Hoenig Haus where conferences now take place (Author 2012)

Figure 30 showing the door to the Franz Hoenig Haus (Author 2012)

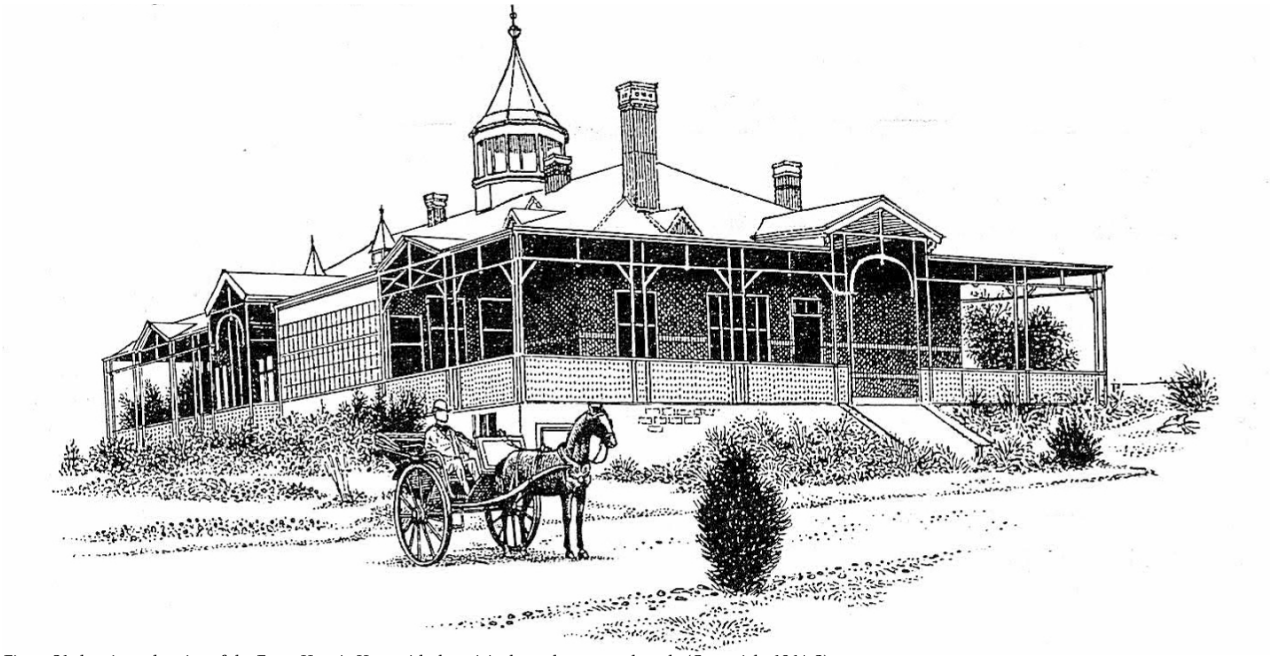


Figure 31 showing a drawing of the Franz Hoenig Haus with the original wooden external work (Cartwright 1964: 2)

> "Twelve miles to the south lay the corrugated-iron town of Johannesburg, sprawling over the farm Randjeslaagte." (Cartwright 1964: 2)

Those that worked in the factory, included Germans, Austrians, Scotsmen, Dutch and Italians. Franz Hoenig was the first factory manager of the Modderfontein Dynamite Company. His house was nearly demolished in 1964, as it was in disrepair, before it was acknowledged as a valuable heritage building. The Franz Hoenig Haus is now a museum and conference venue.

Figure 32 showing The Dynamite Company Museum. The house was built for an official working at the factory in 1896 and is now a museum (Author 2012)

> "It was fortunate for all concerned that Dr Hoenig, who ruled this international assemblage, spoke and wrote German, English, Italian and Dutch and that he was an extremely able man. He decided that the workmen's houses must be grouped according to their nationalities and so sprung up on Modderfontein a series of small settlements called 'Holland', 'Italy', 'Hamburg', and 'Berea'… Hamburg became 'Antwerp' during the First World War and, in 1919, Holland disappeared when a detonator factory was established on the site." (Cartwright 1964: 2)

Figure 33 showing a water fountain as seen by the steps of the Franz Hoenig Haus (Author 2012)

Figure 34 showing The Dynamite Company Museum signage (Author 2012)

Figure 35 showing the old Casino (Author 2012)

The Casino in the Modderfontein village was a recreation hall, a gathering space for managers, office workers and chemists (Cartwright 1964: 64). The Casino Building currently is the Heartland Properties Head Office, which manages the Modderfontein Precinct.

Figure 36 showing the old Casino (Cartwright 1964: 66)

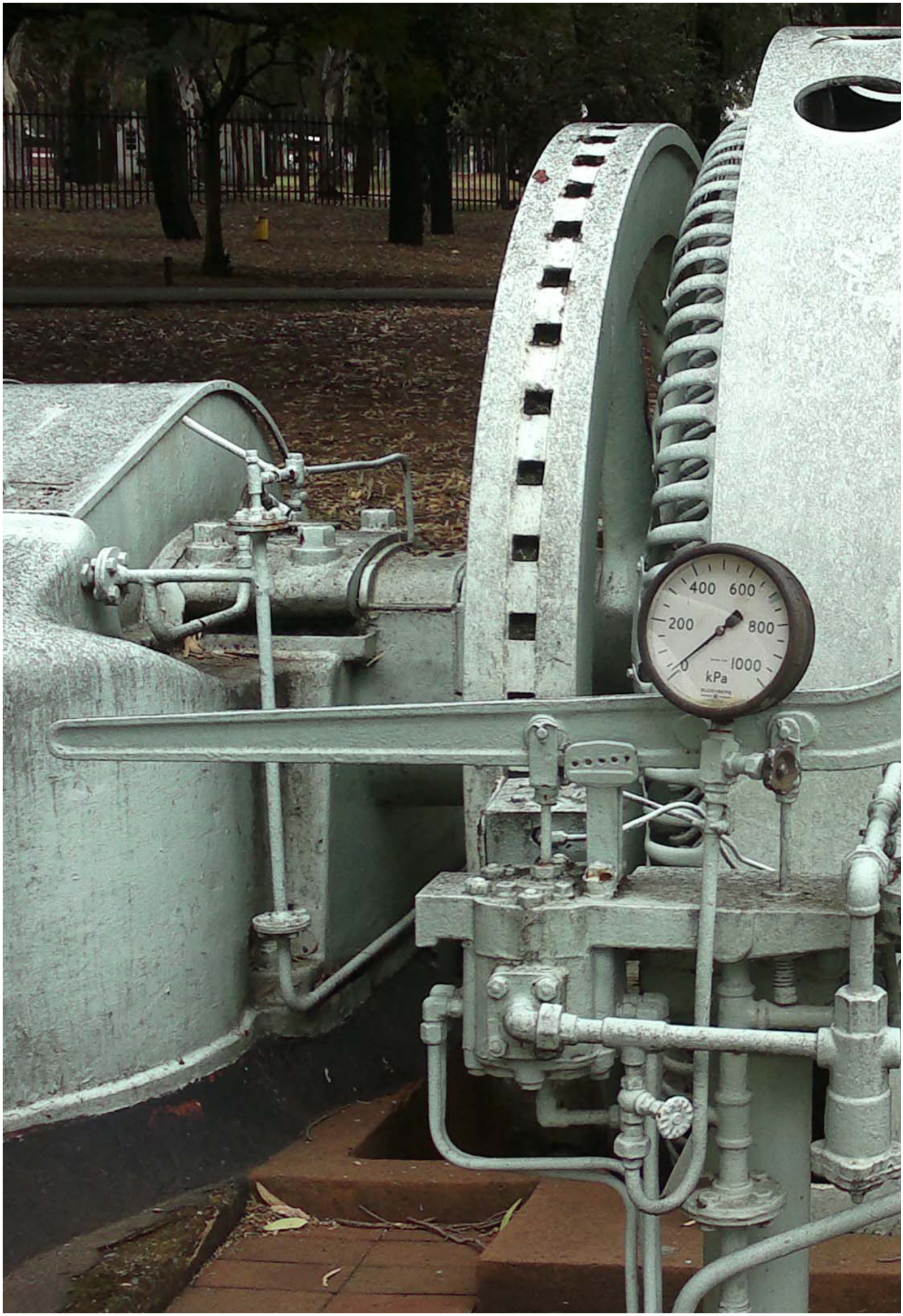


Figure 37 showing an old Air Compressor from the Dynamite Factory displayed in the gardens of the Franz Hoenig Haus (Author 2012)

2.2 Analysis of several Historical Buildings

2 Main Street:
The Dynamite Company Museum is now in what previously was the First Chief Engineer's House. It was built in 1895. The external woodwork has been restored as accurately as possible.


Figure 38 showing the village (Image from City of Joburg)


Figure 39 showing the Museum (Author 2012)

33 High Street Restaurant:
The restaurant is situated in the original Assistant Factory Manager's House. The house was built in 1897. The restaurant has a bar, a large marquee and hosts events and weddings.

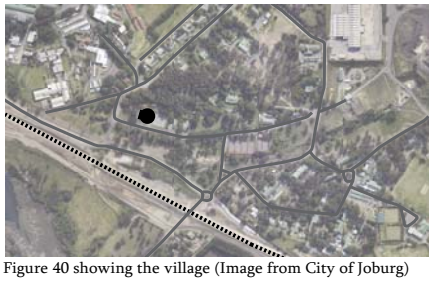


Figure 40 showing the village (Image from City of Joburg)


Figure 41 showing the Restaurant (Author 2012)

29 High Street (1897):
This building was the home of the chief draftsman, later the Fire Masters House. The external woodwork has been restored. The current use is as an office.

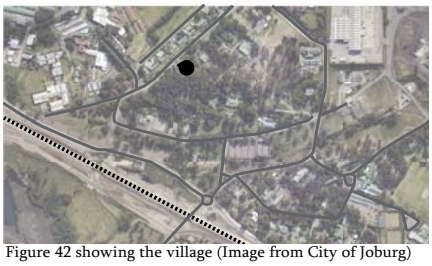


Figure 42 showing the village (Image from City of Joburg)


Figure 43 showing an original house (Author 2012)

Interdenominational Church:
Also known as the little Methodist church, it was built elsewhere in 1914. The building was later moved to the Main Street where it was more accessible to the Modderfontein Public.


Figure 44 showing the village (Image from City of Joburg)


Figure 45 showing the old church (Author 2012)


Figure 46 showing the old Grocery Store (Author 2012)

Old Modderfontein Grocery Store and Butchery (left) (1897) Bakery (right). These buildings are now used for education (pre-school).


Figure 47 showing the old bakery (Author 2012)

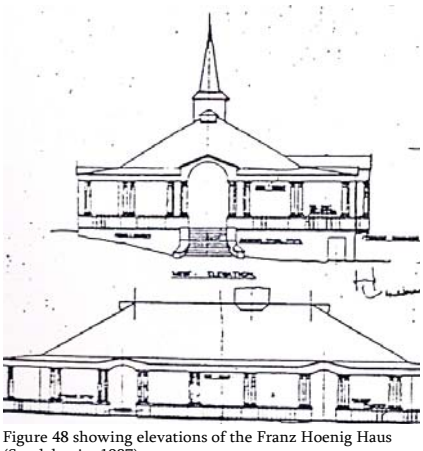


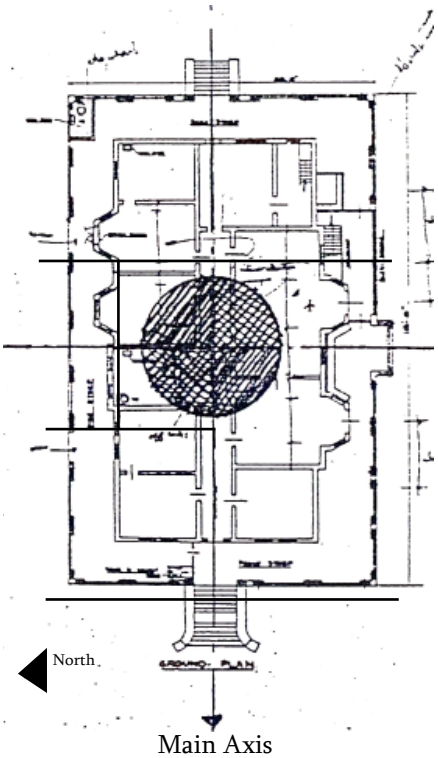
Figure 48 showing elevations of the Franz Hoenig Haus (Sundelowitz 1987)

Figure 49 showing the village (Image from City of Joburg)

2.3 Analysis of the Franz Hoenig Haus

Figure 52 showing the main corridor of the Franz Hoenig Haus (Author 2012)

The Franz Hoenig Haus is very symmetrical. The main corridor running east- west divides the house in half, and is dark. The front door and back door lie on either end of the axis. The house now contains antique furniture. The rooms are used for conferences and events, such as the large dining room.



Main Axis Corridor

Figure 53 (Sundelowitz 1987)

The original external woodwork of the house has been replaced by concrete, when the house was restored in 1932 by Gerhard Moerdyk (Bosman 2010 (HIA Annexure 1): 51).

"Sadly, these alterations, particularly in respect of the external elevations, resulted in significant loss of original character." (Bosman 2010 (HIA Annexure 1): 51)

Figure 50 showing a bedroom in the Franz Hoenig Haus (Author 2012)

Figure 51 showing the veranda of the Franz Hoenig Haus (Author 2012)

Figure 54 showing the dining room in the Franz Hoenig Haus (Author 2012)

The Franz Hoenig Haus has a lush garden which is well maintained, with fountains and antique lamp-posts.

From the dining room there is a view down the street, past the site chosen by the author for the publishing house and book village.

Figure 55 showing the West and Main entrance to the Franz Hoenig Haus with Tuscan ionic columns (by Gerhard Moerdyk) which replaced the original woodwork (Author 2012)

Figure 56 showing the view towards Main Street and Christie's Hill from the veranda of the Franz Hoenig Haus (Author 2012)

2.4 Modderfontein in the 1890s and the Importance of its Landscape

Figure 57 Image showing a line of Pine and Eucalyptus trees on Main Street in Modderfontein (Author 2012)

In the 1890s the Modderfontein landscape was to the European colonizer immense grassland (Cartwright 1964:2) that needed to be organized to show human domination and power. Norman Crowe writes in 'Nature and the Idea of a Man-made World: An Investigation into the Evolutionary Roots of Form and Order in the Built Environment' that "…The search for order in our environment is a mechanism that has evolved to ensure survival within a multifarious and unpredictable world" (1995: 7).

> "In an unfamiliar environment, trees were used as definition- to edge roads, parcel land into plots and ways, and detail lines of vision." (Behrens 2005: 62)

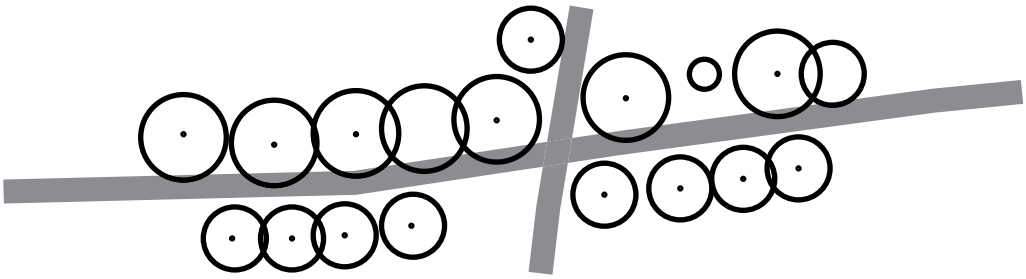


Figure 58 Diagram showing the layout of trees on Main Street (Author 2012)

Figure 59 Aerial Photograph showing the layout of trees on Main Street (Image from the City of Johannesburg)

Figure 60 Photograph showing the current green areas (Author 2012)

The colonizers placed geometries on the land by building roads, and planting vast amounts of foreign trees. The trees that were planted to divide the land and are still currently found in the village include that of Eucalyptus, Pine, Poplar and Willow (Sundelowitz 1987). Large forestation was also planted as blast breaks from explosions from the actual Dynamite Factory (Behrens 2005: 62).

Figure 61 Photograph showing early tree planting in the Modderfontein village in the 1890s (Photograph from the Dynamite Company Museum Archive)

The widespread green areas in and around the Modderfontein village were to promote healthy lifestyles for all its inhabitants, like factory workers, officials and managers. This was to counteract slum development from poor working and living enviroments particularly from the Industrial Revolution (Behrens 2005: 62). This was done with "Utopian visions of industrial endeavor set in quasi-rural environs with rustic timber- framed houses, curving streets and gardens" (Behrens 2005: 62)

Figure 62 Photograph showing the Franz Hoenig Haus and surrounds in 1897 (Photograph from the Dynamite Company Museum Archive)

Another reason for the planting of the foreign trees on the landscape was to recreate a European landscape, "to turn the bare Transvaal into German countryside." (Behrens 2005: 62). The colonizers aimed to create a village for the Dynamite Factory, or series of villages in which its inhabitants would feel as if they belonged there, were comfortable and content. "A sense of place concerns that need to find a familiar landscape as refuge from the unknown…" (Crowe 1995: 71)

Modderfontein was designed to be socially segregated, particularly between the European nationalities of the factory workers, and also between the lower and higher positions of those working and those managing the factory (Behrens 2005: 63). The European labourers were divided into the villages of Italy, Hamburg, Holland and Berea (Behrens 2005: 64). Planting and green areas were an obvious manner in which to separate the various villages. Unfortunately these labourer villages no longer exist.

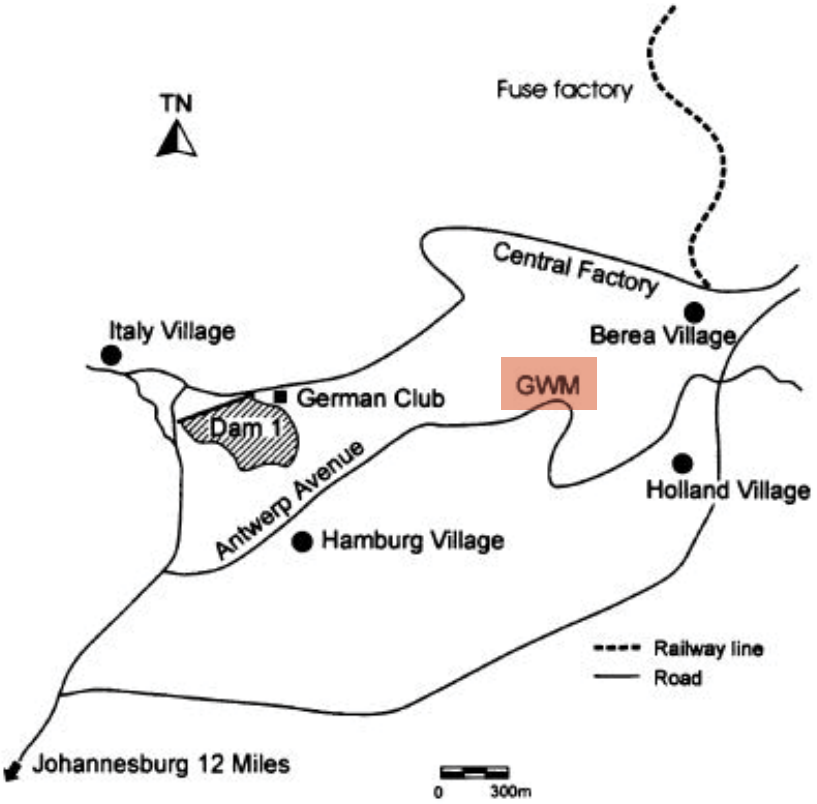


Figure 64 showing the location of the Franz Hoenig Haus (GWM) (Behrens 2005: 63)

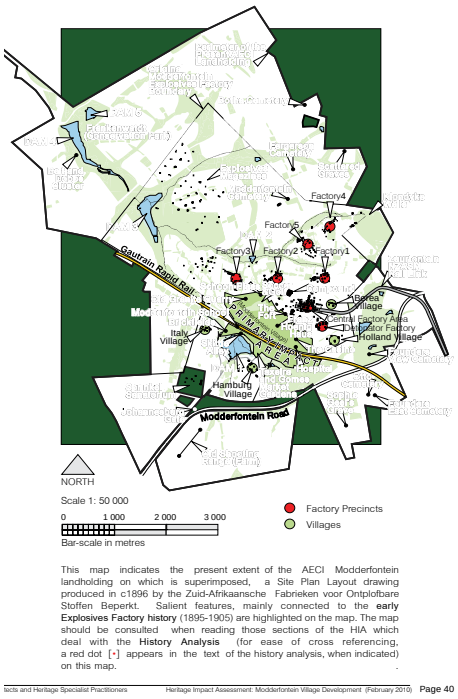


Figure 63 showing the historical location of Hamburg Village, Italy Village, Berea Village and Holland Village. (Diagram by RB Architects and Heritage Specialist Practitioners 2010)

As James Corner mentions in 'The Dark Side of Landscape' in '*Recovering Landscape as a Critical Cultural Practice*' (1999: 10), there is "a moral darkness that derives from landscape being used by power interests to veil and perpetuate their effects."

> "This might be an excessive characterization, but it serves to remind the reader that landscape is not necessarily to the benefit of all in society, that its apparent innocence and idealism can often mask hidden agendas and conceal social inequalities and ongoing ecological destruction. Inasmuch as landscape objectifies the world- in the form of 'scenery', 'resource' or 'ecosystem' for example- it sets up hierarchical orders among social groups, and among humans and nature more generally" (Corner 1999: 12)

Modderfontein was "projected as a rural idyll" and a "ruralesque self- contained community" (Behrens 2005: 62). The Modderfontein village was described as quiet and serene in the 1890s due to the distance of the workers villages to each other and to the officials and managers' houses (Behrens 2005: 63).

Figure 65 showing Pine trees in the gardens of the Franz Hoenig Haus (Author 2012)

The Franz Hoenig Haus (also known as the General Works Manager's house), like many of the other houses, was built along the topography. The roads in the village are organically placed, and of those houses that remain in the Main Village, they are widely spaced apart with gardens. Unfortunately many of the buildings are now barricaded with green fences for security.

> "Adhering to contours, the grandiose General Works Manager's house was situated centrally, at a commanding point of the residential area." (Behrens 2005: 63)

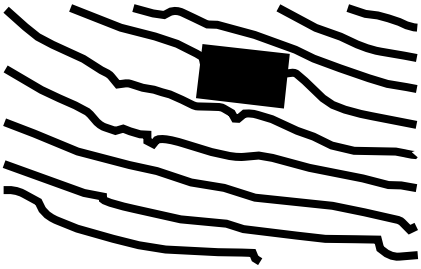


Figure 66 Diagram showing how the layout of the Franz Hoenig Haus follows contours (Author 2012)

Figure 67 Diagram showing how the layout of the Franz Hoenig Haus follows contours with the axis (Diagram by author and aerial photograph from the City of Johannesburg)

It can be seen that throughout the history of Modderfontein, the landscape has played a fundamental role socially. As Norman Crowe said, "Past and place are inextricable" (1995: 78). More than 100 years later, the main heritage village of Modderfontein has a quiet atmosphere reminiscent of its early days, despite the proximity to Sandton and Alexandra. The village still contains many open areas of greenery, Pine and Eucalyptus trees and more recently introduced local species.

James Corner writes that "On the one side, landscape provides the most visible expression and measure of environmental atrophy- it is both victim and indicator- whereas on the other side, it provides the ideal, arcadian image of a profoundly green harmonious world, a world lost and desired again." (1999: 14)

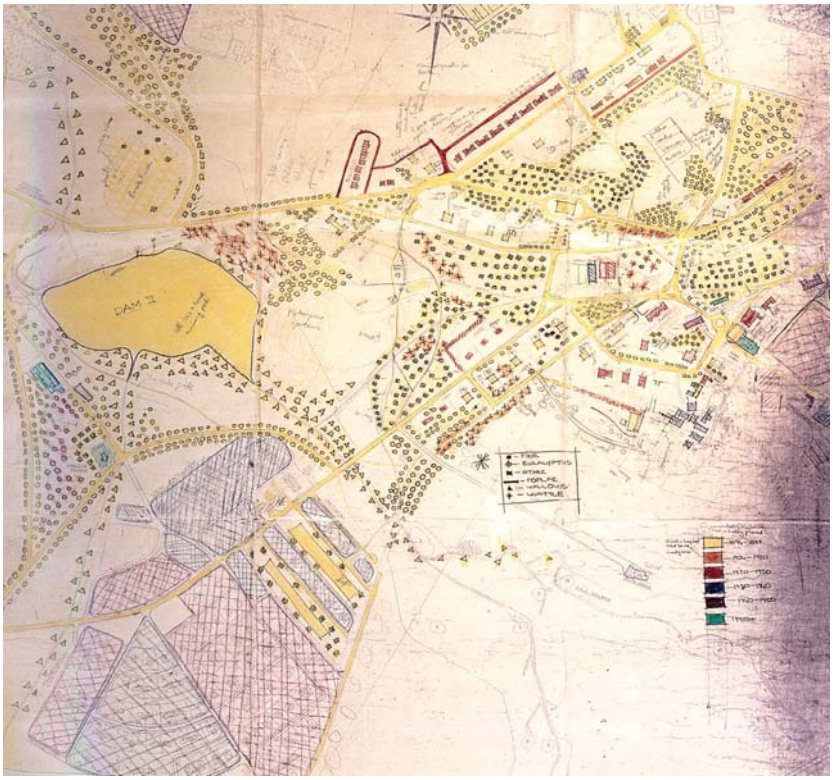


Figure 68 showing a map drawn by S Sundelowitz of the Modderfontein Dam and village. The various colours represent timeframes for the age of buildings and the symbols represent tree species (Sundelowitz 1987)

The introduction of the Guatrain has radically changed the landscape of the Modderfontein village. The future proposed Gautrain Station will encourage further densification of the area and alterations to the village.

But, "As already inferred, landscape is not given but made and remade, it is an inheritance that demands to be recovered, cultivated, and projected towards new ends." (Corner 1999: 12)

Figure 69 showing the garden views from the veranda of the Franz Hoenig Haus (Author 2012)

Figure 70 showing Gautrain Infrastructure in Modderfontein (Author 2012)

03 Mapping & Frameworks

Figure 71 (Author 2012)

3.1 Mapping of the Modderfontein Precinct

A showing Modderfontein Dam 1

B showing a Gautrain Bridge over Antwerp Street going towards the Historical Village

C showing a planted Traffic Circle in the Historical Village

Figure 72 (Author 2012)

3.2 Mapping of Infrastructure and Buildings

Figure 73 (Diagram by author and City of Joburg Aerial Photograph)

Key

- Restaurant
- Museum
- Sports Club facilities
- Clinic
- Retail/ shops
- Library
- Education

Figure 74 showing the signage outside '33 High Street' Restaurant (Author 2012)

Figure 75 showing '33 High Street' Restaurant (Author 2012)

Figure 76 showing the signage and entrance to the Modderfontein Medical Centre (Author 2012)

Figure 77 showing the signage to various facilities (Author 2012)

Figure 78 showing the menu to the Dynamite Coffee Company restaurant (Author 2012)

Figure 79 showing the Dynamite Coffee Company restaurant situated next to the Modderfontein Dam (Author 2012)

3.3 Heartland Spatial Development Framework (2011) for the Modderfontein Precinct

Figure 80 showing the Spatial Development Framework (Image from Heartland Properties 2011)

3.4 Spatial Development Framework from Heartland Properties showing the Village and surrounds (2011)

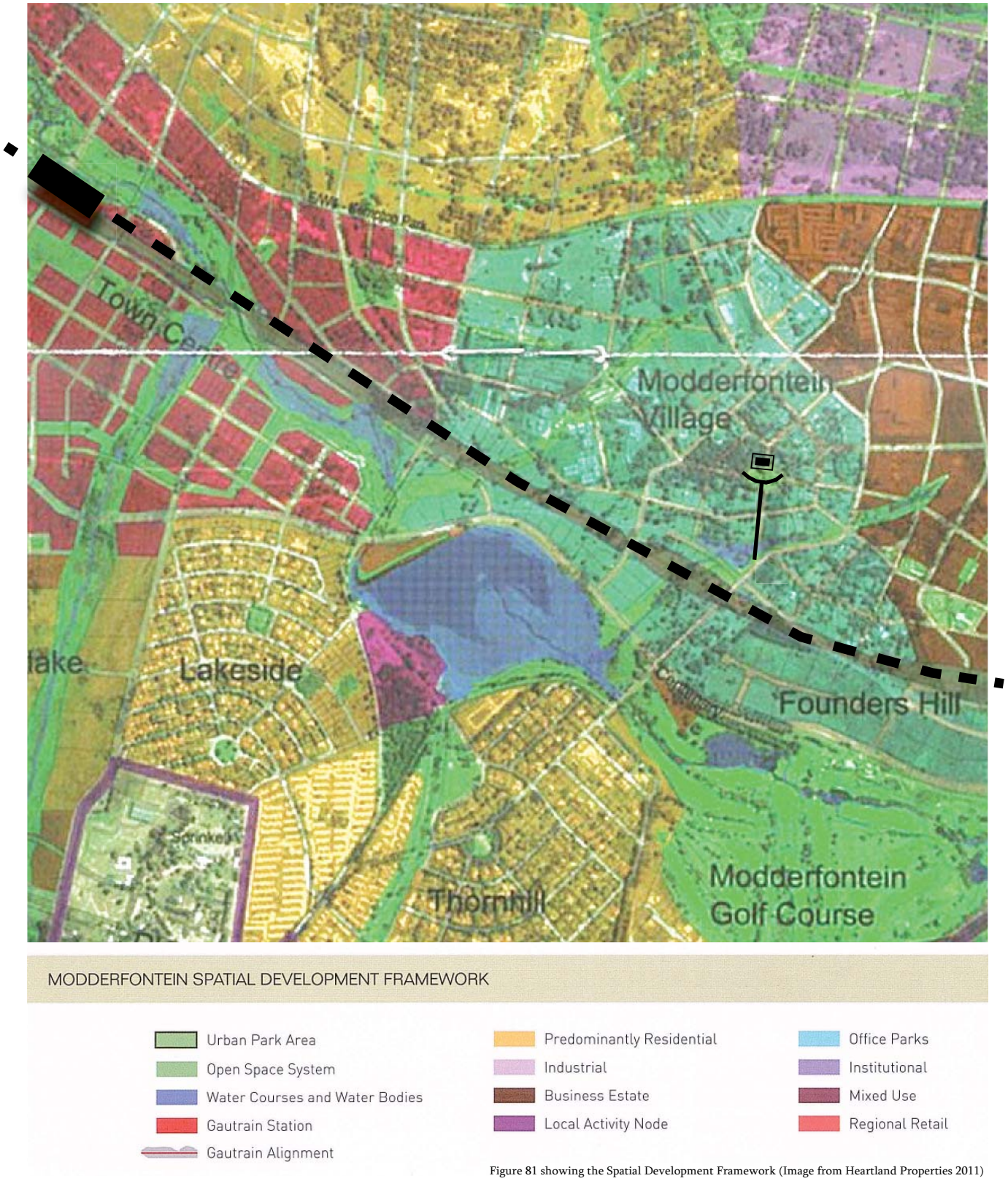


Figure 81 showing the Spatial Development Framework (Image from Heartland Properties 2011)

The current Modderfontein Heritage village has a low density and is spacious. The village is separated from the Dam by the introduction of the Gautrain track. A forthcoming Gautrain station is planned to be built with a surrounding town centre. According to the Spatial Development Framework, the Modderfontein Heritage village is designated as an Office Park. Amidst this Office Park there are green park areas.

3.5 The Heritage Impact Assessment (HIA)

A Modderfontein Village Heritage Impact Assessment for Heartland Properties was compiled by Rocco Bosman in February 2010. Rocco Bosman worked as an Architect and a Heritage Practitioner in Johannesburg.

The objective from Heartland Properties is to "establish a 'new town-in-town', characterised by an urban framework that includes a mixed-use intensity of activity including social facilities and economic opportunity as well as residential development that caters for a range of socio-economic needs." (from the HIA by Bosman 2010: 7 and from the MDF Vol.1, 2007: 21). Densifying the village will have impacts on the trees and the landscape (as mentioned in the excerpt below).

The proposed densification of Modderfontein will inevitably impact negatively on two aspects of heritage, both being environmentally (i.e. landscape) based:

- the partial loss of established trees and the
- the partial loss of the original spatial interrelationship and sparse distribution of built structures,

the cumulative result of which could compromise the historic value of the Development Site if not correctly managed. Development Controls are therefore required to inter alia, minimise and mitigate potential loss of heritage in respect of green and built landscapes. In this report mitigation essentially aims to enhance the interpretation of Modderfontein's cultural resources.

Figure 82 showing an excerpt from the HIA (Bosman 2010: 25)

Figure 83 showing vegetation by the Christies Hill Bridge (Author 2012)

In the Modderfontein Development Framework mentioned by Bosman there are urban qualities and design intentions for the future of the village (See Figure below). Some of these qualities include "cohesive variety of mixed land use"; "de-emphasis of car dominated environment"; accessible and durable quality architecture" (Bosman 2010:7). Design Intentions written include "creating a sense of place"; "promoting qualities of street not road"; "respecting heritage" and "using planting to increase structural legibility" (Bosman 2010:7)

URBAN QUALITIES

- inclusive and compact intensity of activity
- diverse and unique identity of place
- undemanding and secure movement
- cohesive variety of mixed land use
- de-emphasis of car dominated environment
- accessable and durable quality architecture
- clarity and purpose of visual orientation
- aesthetically pleasing environment

DESIGN INTENTIONS

- creating a sense of place
- using public institutions as landmarks
- promoting qualities of street not road
- promoting diversity, choice and convenience
- respecting heritage
- using planting to increase structural legibility

Figure 84 showing an excerpt from the HIA (Bosman 2010: 7)

The Modderfontein Village is shown only as an Office Park in the Heartland Spatial Framework. According to the HIA, the Modderfontein Village should become 20% office, 50% mixed use, 10% institutional and 20% Mixed Residential (Bosman 2010:9).

	DEVELOPMENT PRECINCT	OFFICE USE	MIXED USE	INSTITUTIONAL	MIXED RESIDENTIAL	SOCIAL HOUSING
Fairway Woods	(11) Use Zone E	80% (~15 ha)	NIL	NIL	20% (~4 ha)	NIL
Town Centre	(15) Use Zone F	NIL	60% (~38 ha)	15% (~9 ha)	20% (~13 ha)	5% (~3 ha)
Modderfontein Village	(17) Use Zone A-D	20% (~17 ha)	50% (~41 ha)	10% (~8 ha)	20% (~17 ha)	NIL

Figure 85 showing an excerpt from the HIA (Bosman 2010: 9)

Bosman proposes in the HIA that there should be a maximum 40% coverage above the ground and an 80% coverage for underground parking for new buildings (Bosman 2010: 9).

Figure 86 showing sparse distribution of buildings with many trees (Author 2012)

Figure 87 showing the Framework proposed by R Bosman in the Heritage Impact Assessment (Diagram by R Bosman HIA 2010)

The HIA (Bosman 2010) includes proposed guidelines for future development in the Modderfontein Village. Guidelines relevant to the site selected by the author are listed below:

"- 40% maximum coverage is permitted.
- A maximum height restriction of 6 stories applies.
- New development may not impede the presentation and interpretation of heritage resources.
- All new development must be contemporary in appearance.
- All new development including existing buildings or structures which are not demolished must be treated according to the white and green aesthetic code as prescribed by the Design Review Panel.
- The architectural design approach to all new development including existing buildings or structures which are not demolished must be minimal, simplistic and homogeneous so that it does not detract or interfere with the original character of heritage resources but rather intensifies conspicuousness of such authentic resources. No eclectic, interpretive nor decorative elements are allowed.
- Only clear glazing with no added reflective qualities may be used in the external elevations of new development.
- No shade-netted structures may be erected.
- Covered parking structures must be visually integrated with, and aesthetically similar to, the architectural treatment of newly proposed development.
- Parking bay areas of all external (open) parking facilities must be fully covered by tree canopies and paved with permeable (grass) blocks to facilitate the absorption of storm water.
- Established vegetation must be conserved where possible and all trees requiring felling due to new development, are to be replaced at closest proximity to their original location.
- New tree planting which is indigenous and similar in appearance (stature, scale and foliage density) to previously cultivated exotic pine and eucalyptus species when mature, must be introduced." (Bosman 2010: 27)

Figure 88 showing the car turning circle and view as one enters the Modderfontein Historical village from the south (Author 2012)

Figure 89 showing the view south from the Gate of the Franz Hoenig Haus along Chritie's Hill. This view may not be interrupted as discusssed in the HIA (Bosman 2010) (Author 2012)

Some other principles from the HIA which are appropriate to the site chosen include:

> "No man-made structure may be erected which obscures the visual connection of uninterrupted views as indicated on the Development Precinct Layout Plan. Uninterrupted views connect: Franz Hoenig Haus with Christies Bridge..." (Bosman 2010: 26)" See photograph above.

> "The design of all external furniture (including lighting) must be contemporary and should follow the less is more design principal. No high level (high mast) flood lighting may be installed." (Bosman 2010: 27)

For Development Precinct 2 (see Figure 89), which includes the river to the south of the site chosen by the author for the project.

> "All new development must be used exclusively for facilities required to promote the use of such public parks and/or to facilitate the interpretation of Heritage Sites located within such public parks."

The principles and guidelines proposed in the HIA will be adhered to in the design of the proposed intervention. The proposed building will serve as an example of a building that relates well to the landscape, with minimalist and timeless qualities (as described in the HIA, Bosman 2010: 9) and adheres to the white and green aesthetic code (Bosman 2010: 27). The proposed building will have a mixed-use component, including offices, and residential.

Figure 90 showing the green landscape near the village (Author 2012)

3.6 Framework for Future Buildings in the Heritage Village by the author

The framework is based and adapted from the Heartland Spatial Framework and the Heritage Impact Assessment by R Bosman (2010).

Figure 91 showing allocated Park Sites (diagram by author based on Recommend Interventions by Bosman 2010)

This diagram shows the allocated Heritage Park Sites from the HIA, Recommended Interventions by Bosman 2010 (see Figure 89). No buildings are to be built on allocated Heritage Park Sites unless they contribute to the park. The author proposes that a landscape architect redesigns the embankments to the river to prevent further erosion. These areas could potentially become attractive recreational areas for those living in the new buildings and for the rest of the village.

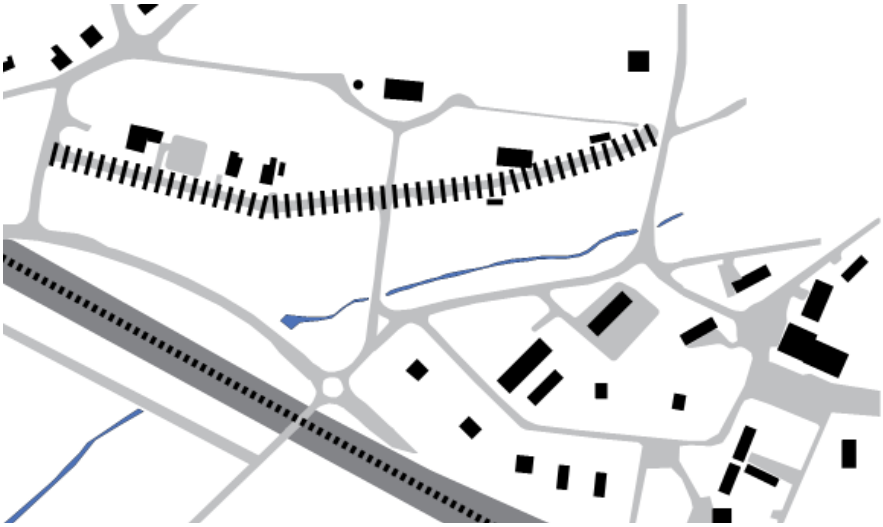


Figure 92 showing the Activation of Main Street, proposed by the author (Author 2012)

This diagram shows the authors intention of activating Main Street and removing the tennis courts. It is proposed to build tennis courts at the existing Modderfontein Sports Club.

Main Street is currently very quiet with visitors mainly going to the restaurant. The reason for activating main street is because this street lies at the very heart of the village. There is a view from Main Street to the southern part of the village and beyond, however the Gautrain infrastructure is now clearly visible and obstructs some of the view.

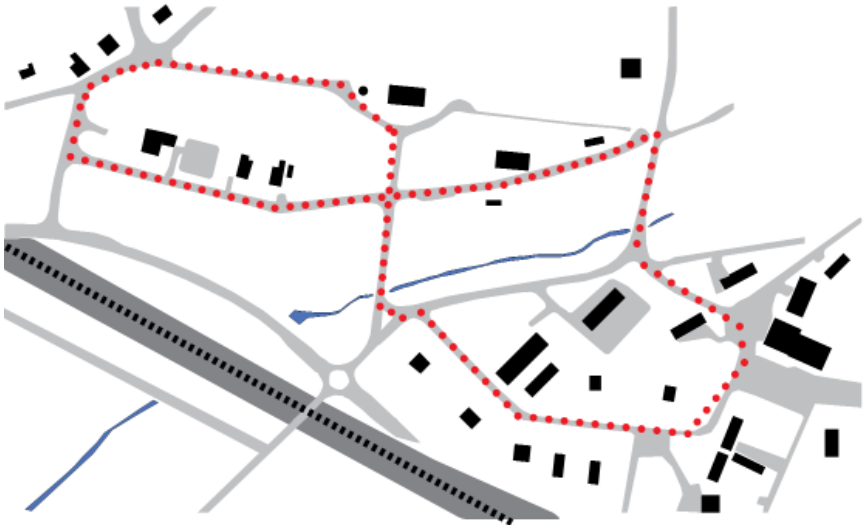


Figure 93 showing a proposed Heritage Walk (diagram by author and partly based on Recommended Interventions by Bosman 2010)

This diagram shows the author's proposed Visitors Heritage Walk, especially along Main Street and Christies Hill. This walk would expose visitors to the old Bakery, first Grocery store, to the first chief Engineers and Managers' houses, to the first interdenominational church, to the old Casino and Dance Hall, to the previous Single Men and Single Women's Living Quarters, to the Medical Centre and to the previous Doctor's House.

Figure 94 showing a public transport route proposed by the author (Author 2012)

This diagram shows the author's proposed public transport route/ shuttle service from the future Gautrain station through the village and to surrounds. Areas of the road may need to be widened as drop-off points.

Due to the introduction of appropriate public transport, it also allows for buildings to decrease its number of parking bays/ garages. In Green Star rating systems if there is adequate public transport, then points are allocated for a reduction in car parking spaces/garages.

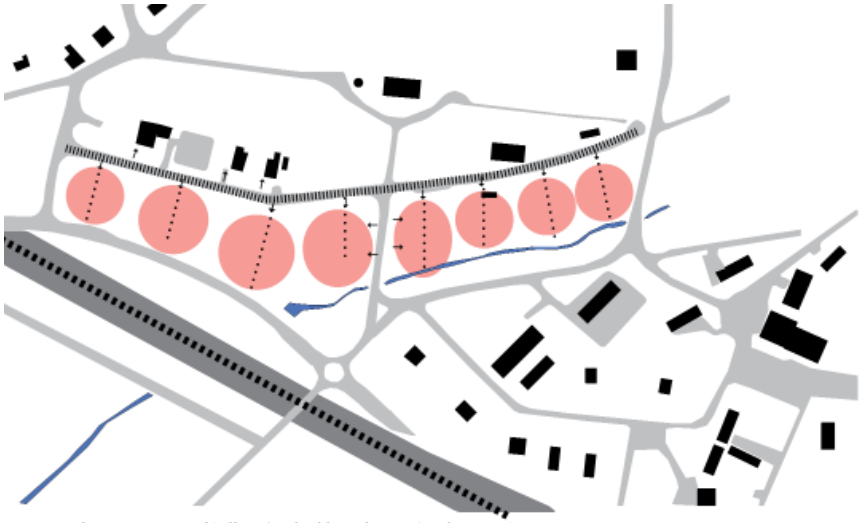


Figure 95 showing a series of 'villages' or building clusters (Author 2012)

This diagram shows the authors proposed developments along Main Street. These developments have public entry via Main Street, therefore activating it. These developments/ clusters of buildings are named 'villages' in the framework. This is due to the history of Modderfontein, in which it comprised of many villages of different nationalities. The 'villages' proposed by the author include that of cooking/baking, clothing/ shoe design, graphic design/advertising, books and publishing, events, computers/programming and architecture/interior design.

Figure 96 showing zoning proposed by the author (Author 2012)

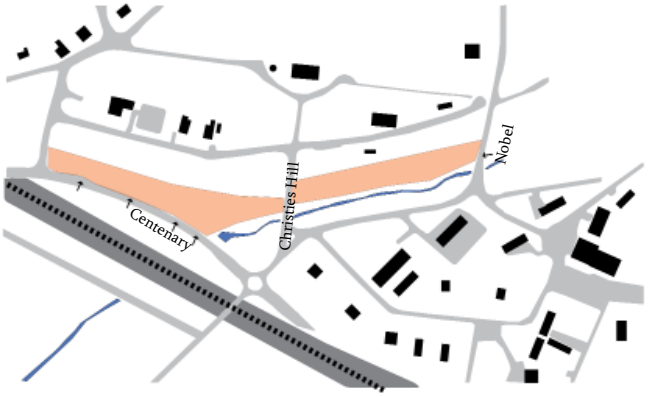


Figure 97 showing zoning proposed by the author (Author 2012)

The diagram above shows the authors intention of placing public-orientated buildings such as shops, restaurants and some offices in these areas. These public- orientated buildings have visitors parking which is accessed from Main Street.

The diagram above shows the authors intention of placing residential buildings such as apartments and studios in these areas. These buildings have parking or allocated parking bays which is accessed from Centenary Street, Christies Hill or Nobel Avenue.

Figure 98 showing the Framework proposed by the Author for future development in the area south of the Franz Hoenig Haus (Author 2012)

Key

- Proposed new buildings with guidelines by author
- Controlled development sites according to HIA (Bosman 2010)
- Existing River
- Heritage Park Sites allocated by HIA (Bosman 2010)
- Existing Heritage Buildings
- Pedestrian walkways
- Gautrain

1 Village based on Cooking and a Bakery

2 Village based on Clothing and Shoe Design

3 Village based on Graphic Design, Advertising

4 Village based on the Book and a Publishing House

5 Place of events/ market/ gatherings/ concerts

6 Village based on Computers and Programming

7 Village based on Architects and Interior Design

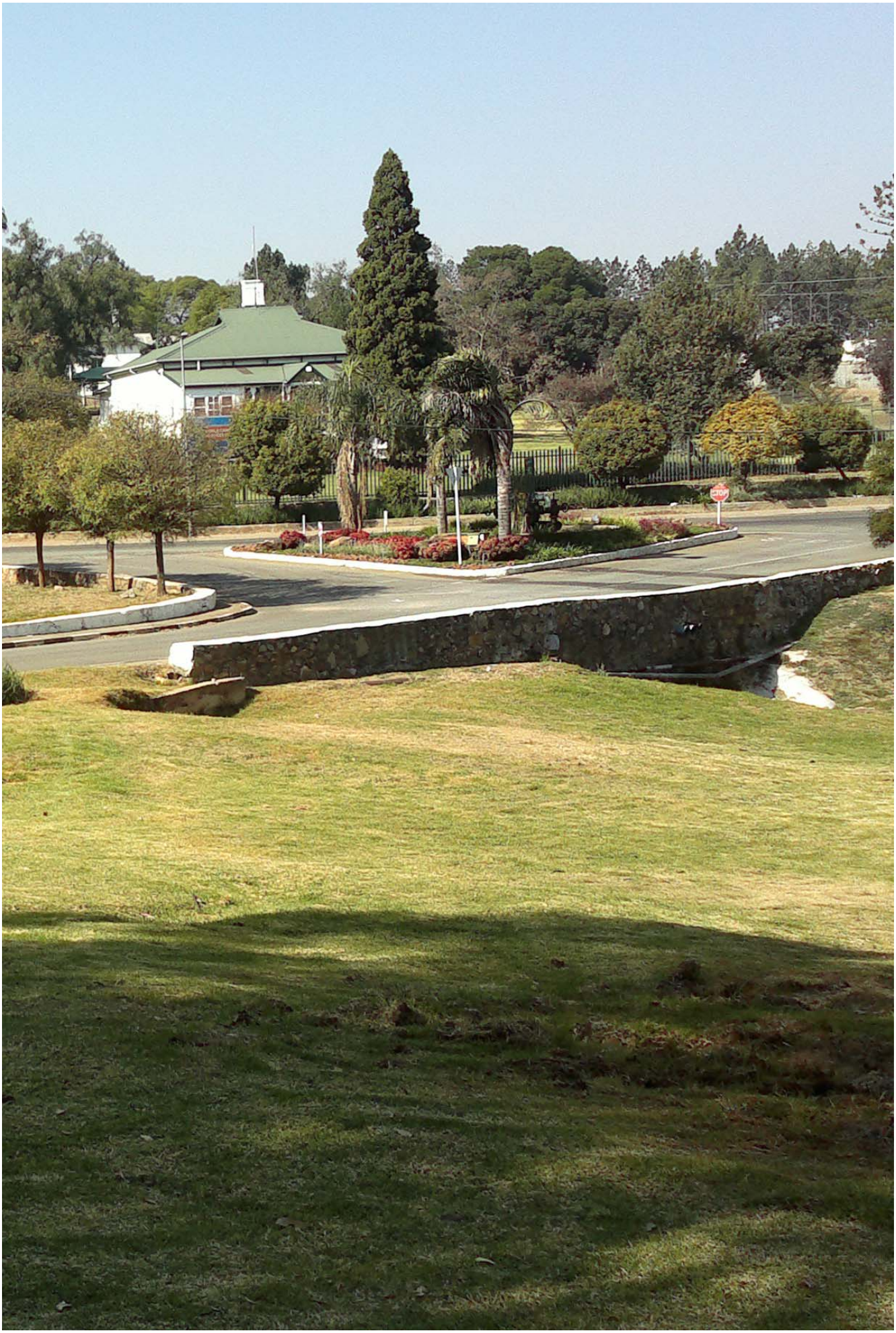


Figure 99 (Author 2012)

04 The Site and Approach

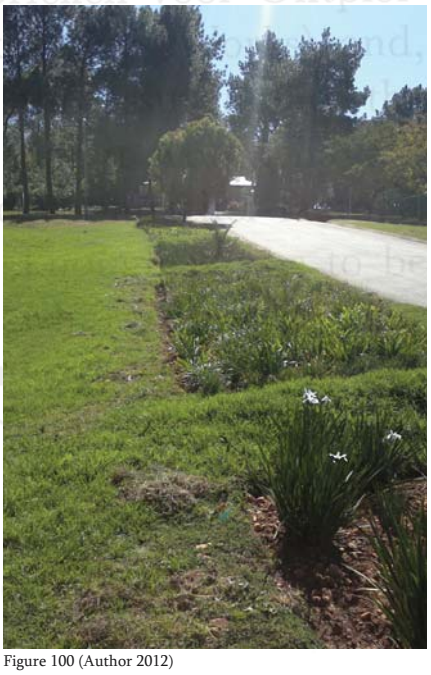


Figure 100 (Author 2012)

4.1 Site Exploration

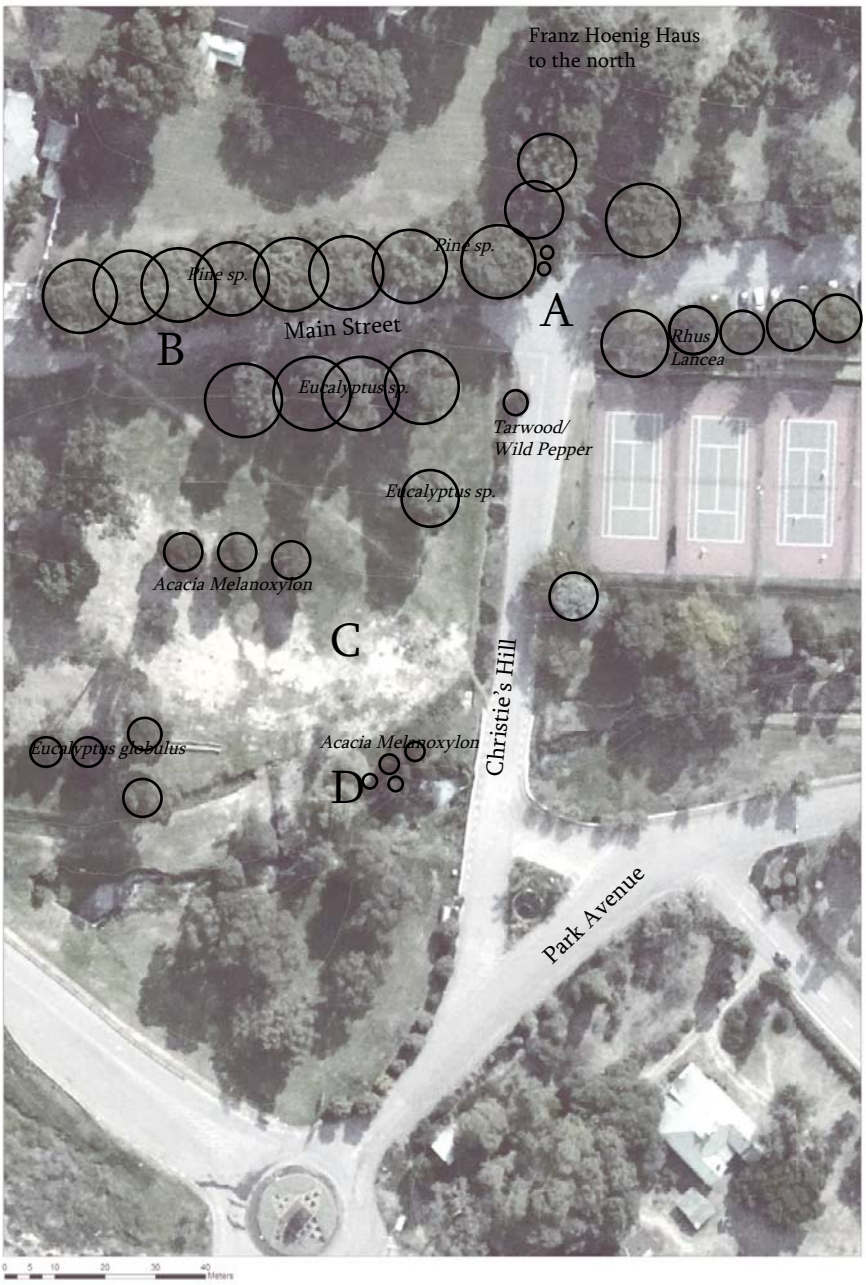


Figure 104 showing an aerial photograph of the site (image from the City of Johannesburg)

A Figure 101 showing the view down the axis from the Franz Hoenig Haus (Author 2012)

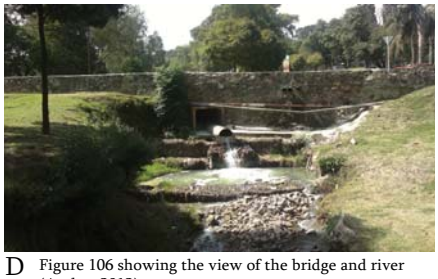
B Figure 102 showing the view eastwards of the trees on the site facing Main Street (Author 2012)

C Figure 103 showing the view of the bridge on Christies Hill (Author 2012)

Some samples of tree leaves and flowers were taken from the site. These were analysed and identified at the University of Pretoria's Plant Sciences Building by a Botanist: these included the *acacia melanoxylon* (not indigenous), *the rhus lancea* (indigenous) and the Tarwood/ *loxostylis alata* (indigenous).

Figure 105 showing a topographical section without trees running north to south through the site (Computer Model generated by author 2012)

According to Clayton Cook (who wrote about the planting in the Modderfontein village in an EIA), "The majority of open areas or landscapes are dominated by exotic, regularly maintained mono-cultured lawns (kikuyu) with several pockets or stands of exotic or alien trees species (*Acacia mearnsii, Salix babylonica, Eucalyptus sp., Pinus sp., Populus deltoids*)... Scattered indigenous trees occur around the property including *Acacia karroo* as well as *Rhus lancea*."(Cook 2007: 2)



D Figure 106 showing the view of the bridge and river (Author 2012)

4.2 The Site

The site selected for the proposed project is currently part of a park with grass and trees. The site does not have remains of any buildings. The history of the site lies in its relationship with the village and the Dynamite Factory.

The site was once highveld grass, with no trees at all. The planting of the trees and of the garden lawn is a sign of human domination and interference. There is a river to the south of the site, an unnatural river designed to transport excess water from the industrial area of the Modderfontein Dynamite Factory to the Modderfontein Dam 1. The river currently has turquoise colour that signifies chemically diluted and industrial waste water.

The site lies south of the Main Street, where the homes of those highest in the social hierarchy of Modderfontein are located (such as the chief engineers, Factory managers, etc).

Due to the construction of the Gautrain, the dynamics of the entire village have changed. Where once the Dam and the Heritage village were connected and was walkable, they now are detached from each other. One has to drive under a Gautrain bridge in order to reach the heritage village from the Dam.

Figure 107 showing existing planting along Christies Hill (Author 2012)

The site chosen for the proposed project could be treated by a combination of two different approaches. These include that of the Cleared and Constructed site discussed by Carol Burns. The Cleared site approach sees the site chosen by the author in Modderfontein as "Unoccupied, lacking any prior constructions and empty of content" (Carol Burns in On Site, edited by Khan 1991: 149) as no buildings have been built on the site. The site chosen currently only contains trees and grass.

However the site is not devoid of content or meaning at all. No site is a cleared site. Often site is only looked as how "forces acting upon it have affected its present form... However, local circumstances cannot be considered simply in terms of space; they also require a diachronic apprehension of time." (Carol Burns in On Site, edited by Khan 1991: 149) The other approach discussed by Carol Burns in 'On Site: Architectural Preoccupations ' is that of the Constructed Site. The Constructed site "emphasizes the visible physicality, morphological qualities and existing conditions of land and architecture" (Kahn 1991: 153)

The difference between the Cleared and the Constructed Site is that the Cleared Site technique makes use of the plan and thus flattens the land (Kahn 1991: 151) However the Constructed Site uses the landscape features and topography in section (Kahn 1991: 154).

The Cleared site approach uses the buildings to form the content (Kahn 1991: 151) for the site whereas the Constructed site approach uses the landscape to form the content (Kahn 1991: 154). Burns concludes in these approaches that one cannot only use the Constructed Site approach, as the nature of building will change the landscape and thus create a different landscape. She writes:

> "Therefore rather than attempt to maintain a neutral stance, the architect must take responsibility for the site and assume its control for a limited passage of time." (Kahn 1991: 155)

Figure 108 showing 33 High Street Restaurant and Main Street (Author 2012)

4.3 Creating a Sense of Place within a Place

There are several methods for place-making that shall be used for the proposed intervention in the existing 'cultural landscape'. The village itself is a destination. The feeling conveyed by the village to the visitor is that of tranquility, except for that of the occasional gardeners working or the Gautrain passing by. With future densification of the village this could change. The village itself was self-contained and even now it stands as a pocket in what seems to be rural countryside with rolling green hills amidst the highly densified and built up Johannesburg and surrounds.

Firstly the building needs to have a very sensitive relationship to the topography as mentioned previously, using the ideas of the Constructed and Cleared Site. According to Norberg-Shulz in *Genius Loci: Towards a Phenomenology of Architecture*, "If the settlements are organically related to their environment, it implies that they serve as a foci where the environmental character is condensed and 'explained'." (Norberg-Shulz 1980: 10)

Secondly there needs to be a distinction between the earlier buildings and the more recent buildings. There should be an obvious contrast between the proposed project and the existing intricate heritage buildings. The proposed building should not be a replica of 1890s styles used in the village, but rather a building which is contemporary to 2012. Otherwise there is a similarity or uniformity to all the buildings which is confusing to the visitor. It is important that "we sense a resonance between the new and the old, between what came before and that which has been added or has evolved." (Crowe 1995: 90)

The manner in which planting and trees is treated can contribute to place-making. Great importance was given to the green planted landscape in the history of the village (See Context Chapter) in creating social hierarchy and a 'Germanic Countryside'. If the proposed project emphasizes the trees and planting of the site, the open outdoor areas and retains the trees, this is being sensitive and respectful to the initial intentions of the colonizers. James Corner writes that landscape can be "seen as a means to resist the homogenization of the environment while also heightening local attributes and a collective sense of place." (Corner 1999: 13)

The suggested project by the author should have an adequate scale in relation to the rest of the village. The scale of the Franz Hoenig Haus, the Chief Engineers and Managers Houses (now offices), and other houses are single storey, with basements. The existing tallest buildings in the village are only double-storey, like the Casino (Heartland Properties Office). It is written by Norman Crowe that "thus, to be perceived as beautiful and as part of nature, buildings should be proportioned according to the human body" (Crowe 1995: 96). It is suggested that the proposed building should be a maximum of two storeys, but the roof space may also be used as an outdoor room with a garden.

> "The use of geometry that characterizes our architecture and urbanism was present from the beginning. It emerged not as a 'style' bestowed upon things as a passing fashion but with intrinsic meaning and in response to an awareness of our bodies in relation to the natural environment." (Crowe 1995: 233)

With the right intentions, the proposed interventions could contribute in a highly positive manner to the village and to the landscape. The village has now become a monofunctional office park with a restaurant, but with the new interventions and mixed-use programmes, it may yet again become a 'village', 'a home', 'a place' for living and working in.

Figure 109 showing a Tarwood tree on the site (Author 2012)

Figure 110 showing a Eucalyptus Tree on the site (Author 2012)

Figure 111 showing the site (Author 2012)

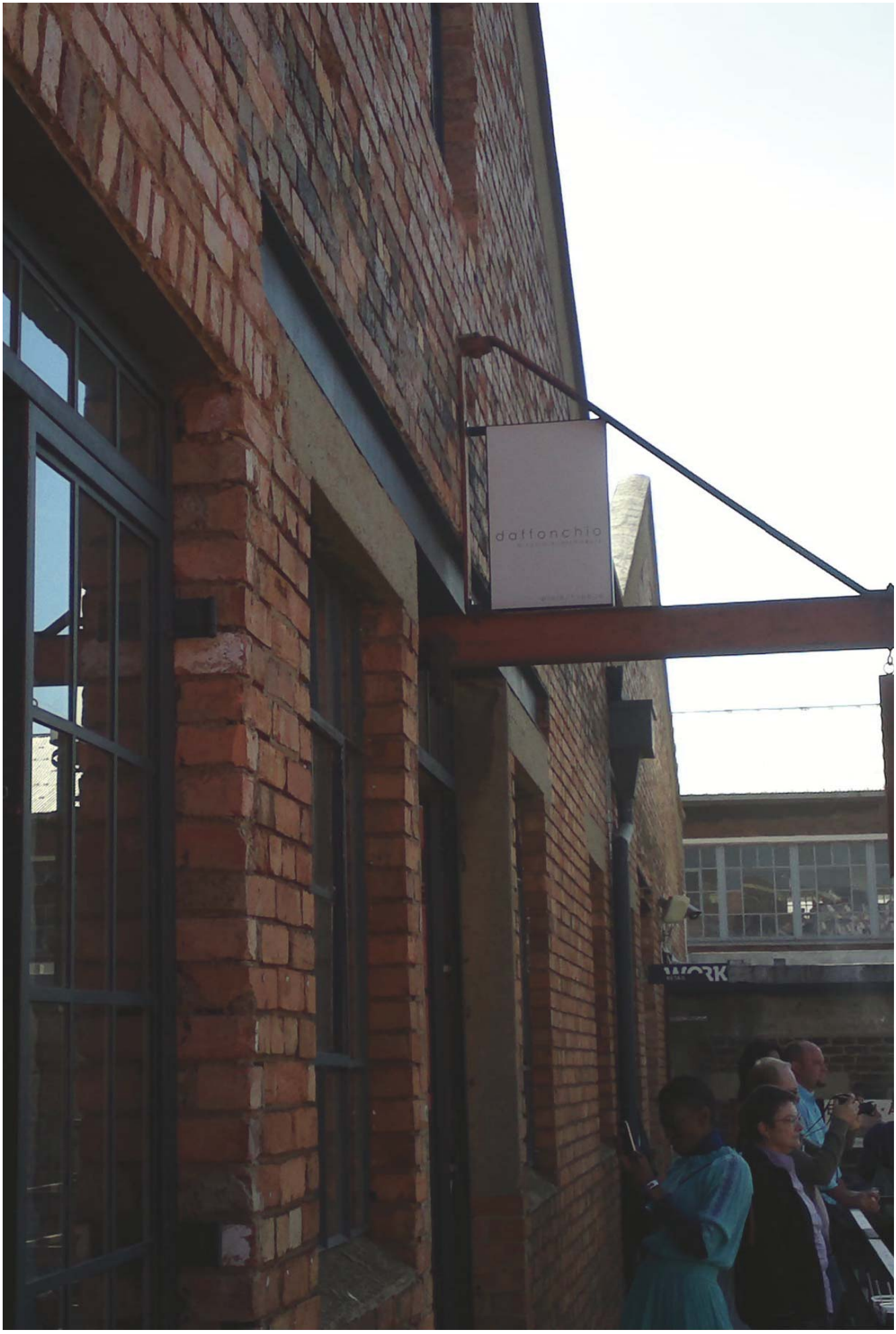


Figure 112 showing Arts on Main (Author 2012)

05 Precedents

Figure 113 (Author 2012)

5.2 Liliesleaf Liberation Centre

The Liliesleaf Liberation Centre, designed by Mashabane Rose Architects, and located in Rivonia, Johannesburg was studied. This building also deals with Heritage and Cultural Landscapes.

"The complex comprises a visitor's centre and a resource centre, each located on opposite boundaries of the site, with the historical restored manor house and farm outbuildings located centrally (Digest 2008: 42)."

The reason this building was chosen as a precedent is because of the very Modern Nature of the new buildings which stand in contrast to the older buildings (like the former home of the Goldreich Family). It mentions in an article in the Digest of South African Architecture (2008: 42) that "the architectural language of the contemporary buildings makes a strong reference to the architecture of the small outbuildings in an effort to maintain a visual silence in the landscape."

The new buildings are abstract and minimalistic with concrete, brick and glass. The use of various terraces, a roof garden, ramps and the moulding of the landscape, lawn and highveld grass is successful.

Figure 114 showing the restaurant and outdoor seating area at the Liliesleaf Liberation Centre (Author 2012)

Figure 115 showing the roof garden of the Liliesleaf Liberation Centre (Author 2012)

Figure 116 Resource Centre at Liliesleaf (Author 2012)

Figure 117 showing the existing old structure with new concrete additions at the Liliesleaf Liberation Centre (Author 2012)

Figure 118 showing Lilieslief, with moulding of the landscape into various platforms, steps, grass areas and ramps (Author 2012)

Figure 119 showing stairs and paths around the Liliesleaf Liberation Centre (Author 2012)

Figure 120 showing a plan of Liliesleaf Liberation Centre (Digest 2008: 44)

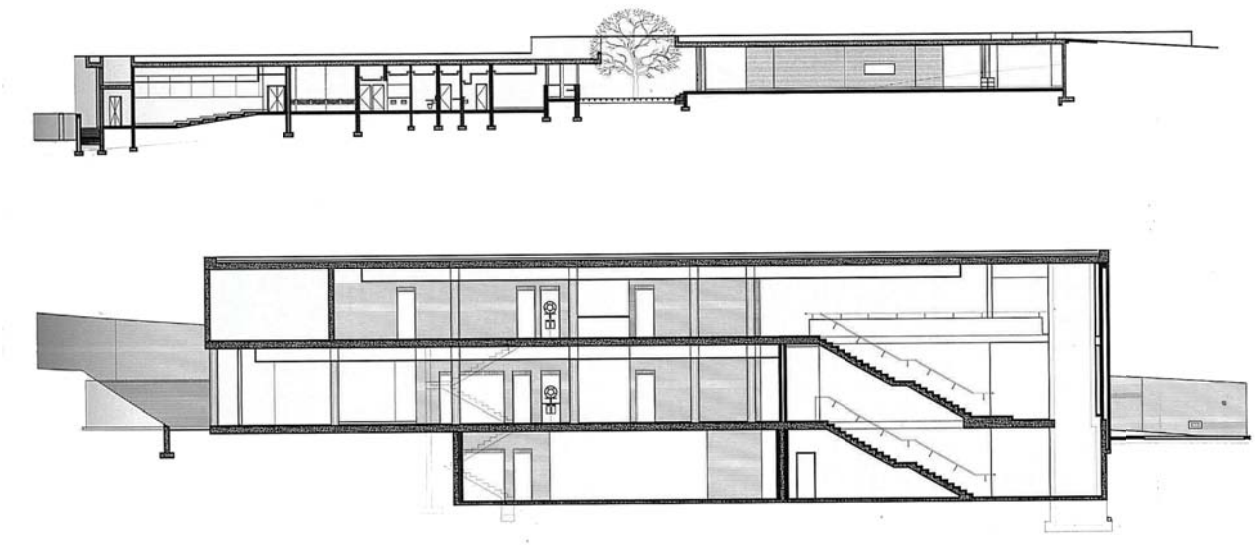


Figure 121 showing a section through the Visitor's Centre (above) and through the Resource Centre (below) (Digest 2008: 44)

5.5 Arts on Main

Arts on Main is an agglomeration of buildings including an old industrial warehouse (built in 1911) in the Maboneng Precinct in inner city Johannesburg. These buildings have been "connected, restored and converted from light industrial to a variety of work, exhibition and recreational spaces for creatives" by Daffonchio and Associates Architects (Joynt 2010: 212).

Figure 122 showing the courtyard of Arts on Main and high rise buildings in surrounding inner city Johannesburg (Author 2012)

Arts on Main contains contemporary art galleries from significant South African artists, organisations, a restaurant, stores and residential spaces. It also has events which include Sunday markets, talks and performances.

Figure 123 showing the courtyard of Arts on Main and the roof of the restaurant which is used as an outdoor deck (Author 2012)

The reason this building was chosen as a precedent was because of the variety of functions that the building holds. There are studios where artists can live and work. The building also contains original facebrick walls, painted brick walls, as well as the use of new corrugated iron for sliding doors and bathroom doors. This spatial juxtaposition of new and old industrial elements in inner city Johannesburg makes Arts on Main a successful creativity hub.

Another important aspect and influence of this precedent is the main courtyard and garden. "The garden forms the main public focus of Arts on Main, with the restaurant and its rooftop bar and various retail and gallery spaces leading onto and overlooking it." (Joynt 2010: 212)

Figure 124 showing a loft level in one of the studios in Arts on Main (Author 2012)

There is a combination of various levels outside and inside, staircases, rooms and corners, which to the visitor may seem confusing. This, however, does promote curiosity and interest.

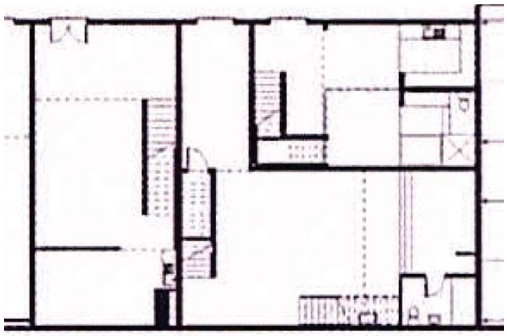


Figure 126 showing part of the plan of Arts on Main (Digest 2010: 213)

A portion of the plan showing staircases and multi-level studios is shown to the left.

Arts on Main was visited by the author during a busy and festive Sunday market. The artists' studios were open to the public.

Figure 125 showing a hall leading to various artists studios behind the corrugated iron sliding doors in Arts on Main (Author 2012)

Figure 127 showing various levels in one of the artist's studios in Arts on Main (Author 2012)

Figure 128 showing roof lighting in a multi-level studio in Arts on Main (Author 2012)

Figure 129 showing the use of corrugated iron and white painted facebrick in Arts on Main (Author 2012)

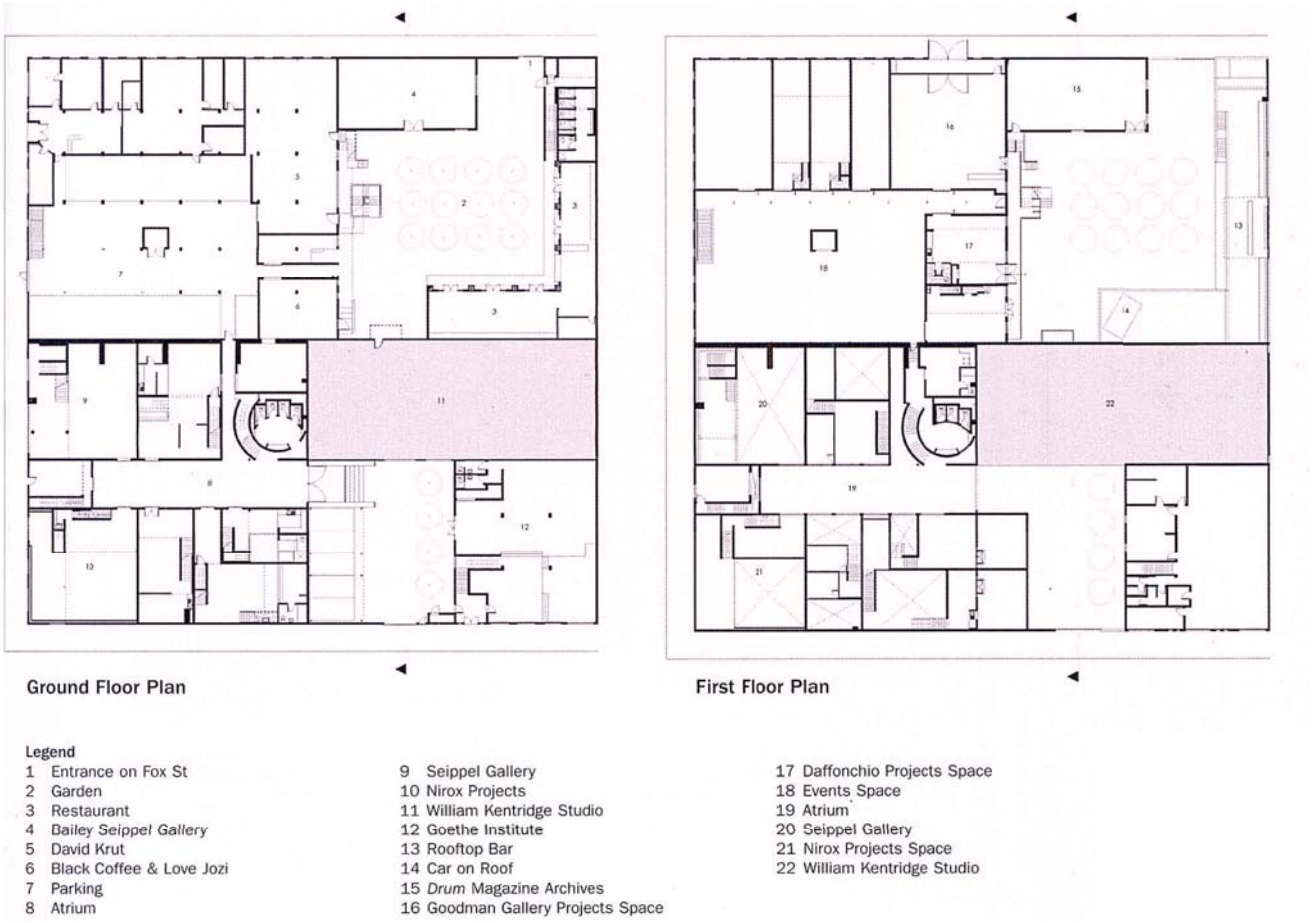


Figure 130 showing plans through the Building (Digest 2010: 213)

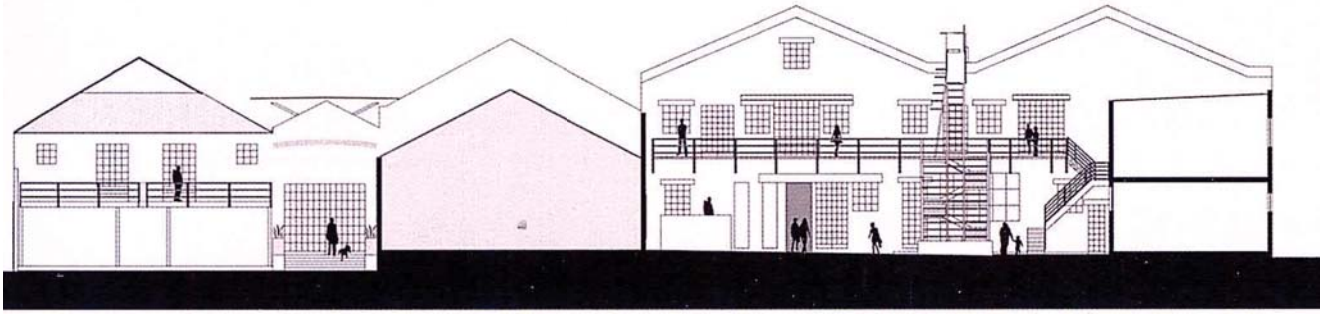


Figure 131 showing a section through the Building (Digest 2010: 213)

Figure 132 showing an earlier photograph of Arts on Main taken in 2010 (photograph from http://www.citichat.co.za/2010_04_01_archive.html)

Figure 133 showing various items for sale at the market (Author 2012)

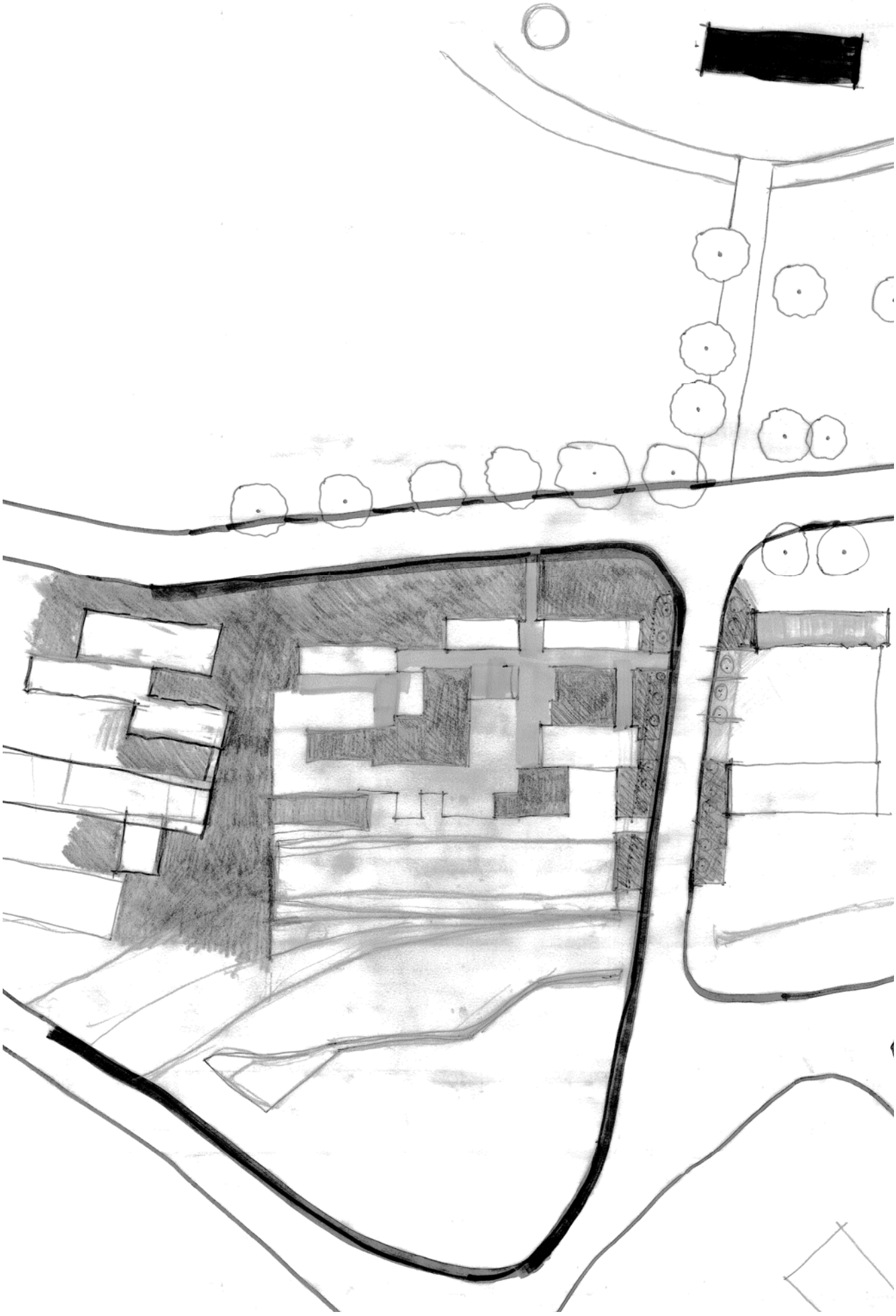


Figure 134 (Author 2012)

06 Design Development

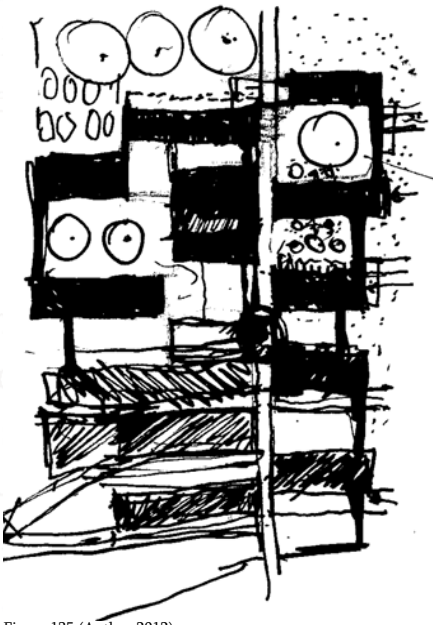


Figure 135 (Author 2012)

6.1 The Design Process

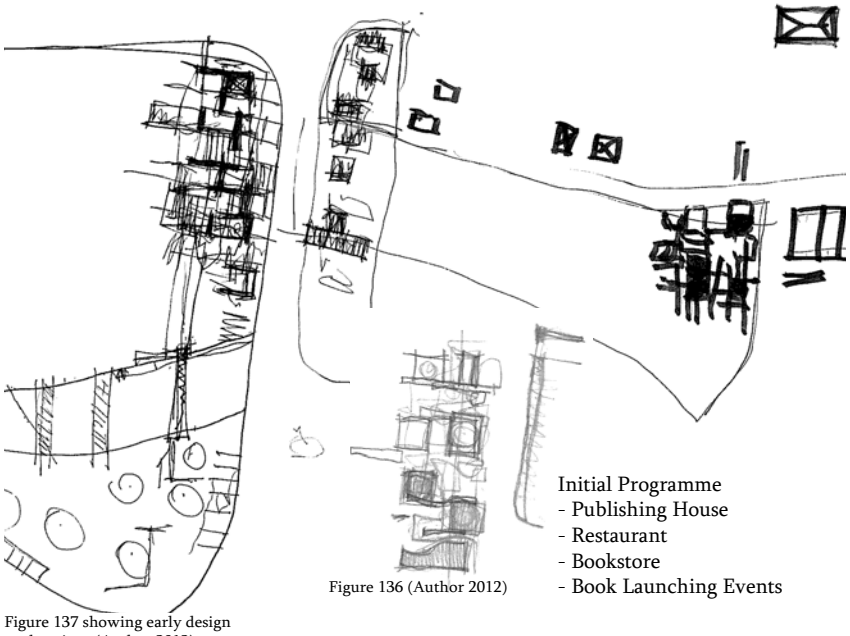


Figure 136 (Author 2012)

Initial Programme
- Publishing House
- Restaurant
- Bookstore
- Book Launching Events

Figure 137 showing early design explorations (Author 2012)

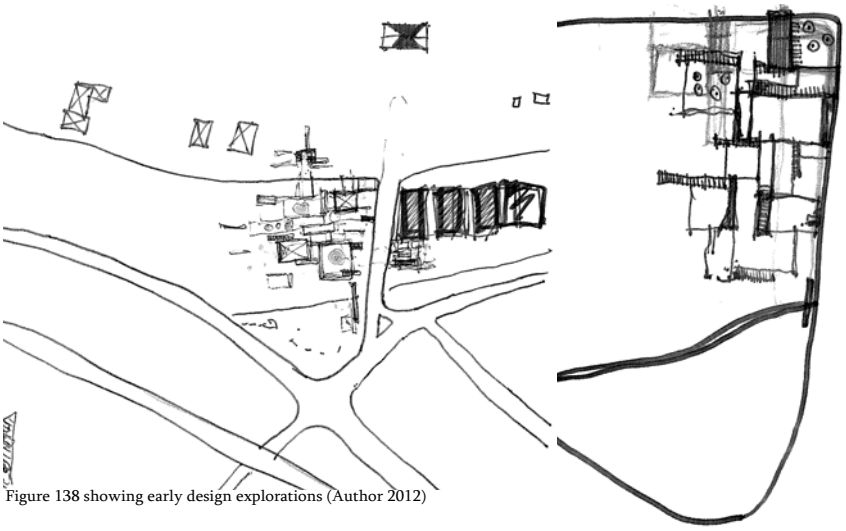


Figure 138 showing early design explorations (Author 2012)

- Before a site was selected (in March) an emotive model, intuitively built by the author, depicts a complex, inwardly focused and intricate building with many levels, walkways, walls and outdoor areas (see Figures 137-139) and later another model explores a building within the chosen site (see Figures 140 and142)

Figure 139 showing an emotive model built by the author (Author 2012)

Figure 140 showing an emotive model built by the author (Author 2012)

Figure 141 showing an emotive model built by the author (Author 2012)

- The initial programmatic ideas consisted of a Publishing house, a bookstore, a book- launching venue and a restaurant, but the programme changed later to include a residential component. The final programme and programmatic arrangement is discussed later in this chapter.

- The first concerns were about massing, the slope, the landscape, terraces

- There is an axis running from the south through Christies Hill to the Franz Hoenig Haus. It was decided that this axis needed more planting/ or trees and built form to reinstate its importance.

-Early on it was decided that the tennis courts may need to be removed as the land is very valuable and could be used for other means, and the tennis courts could be built in closer proximity to the other sports facilities at the Modderfontein Sports Club. In the Framework developed the land where the tennis courts lie becomes an open/ flat area of land where public events take place, such as markets and festivals.

-The first attempts of a building were of a broken-up nature, with orthogonal lines, and many terraces and smaller spaces. The building project from early on comprised of many smaller buildings and outdoor spaces with new trees and planting. This was due to the nature of the smaller existing corrugated iron and brick buildings with large green open areas surrounding the buildings and open rooms/ verandas. The orthogonal lines in the plans, as opposed to curvilinear or angular, correspond/relate and are sensitive to those existing orthogonal buildings built in the late nineteenth century in the village.

- It was only when further research was done on the history of the site that the significance of the existing Eucalyptus and alien trees was established. The diagrams thereafter retain all the existing trees and have built form surrounding these trees.

Figure 142 showing a concept model within the site built by the author (Author 2012)

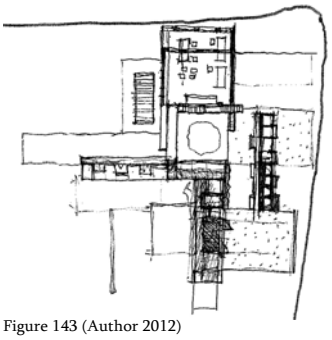


Figure 143 (Author 2012)

- These early conceptual building attempts revolved around manipulating the contour lines in order to create terraces or maintaining the slope of the land within courtyards

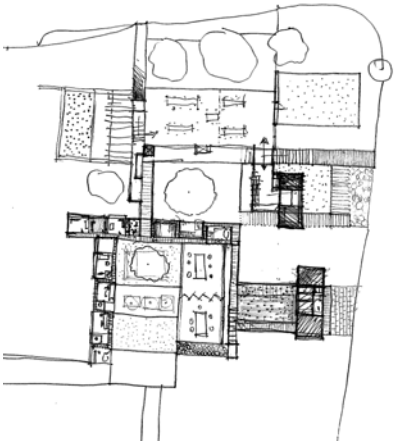


Figure 144 (Author 2012)

Figure 145 showing a concept model within the site built by the author (Author 2012)

Figure 146 (Author 2012)

- There were various options explored for the bookstore. These being a bookstore submerged in the ground with roof lighting or various layouts for the actual bookshelves.

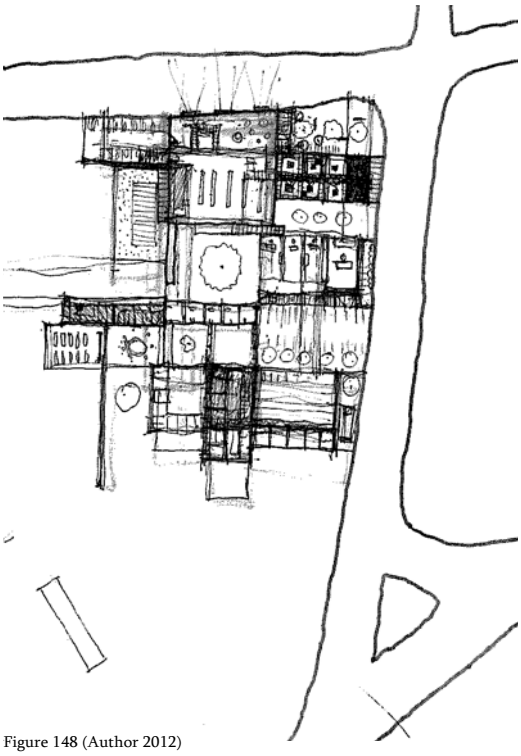


Figure 148 (Author 2012)

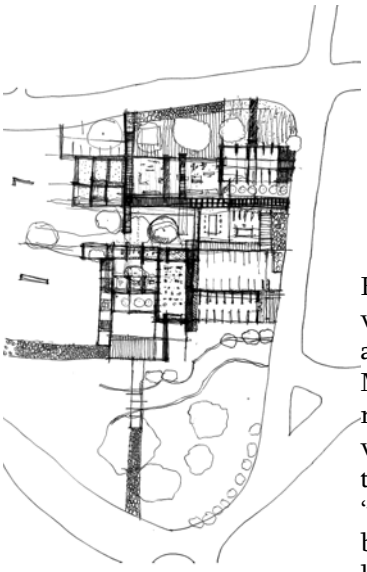


Figure 149 (Author 2012)

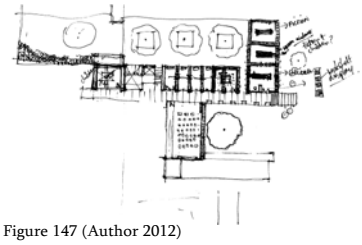


Figure 147 (Author 2012)

By this stage, the author was dealing with planning issues. The bookstore and the restaurant initially faced Main Street. In these sketches the restaurant contains a deck which wraps around the trees or opens out towards the trees mimicking the 'veranda' from the other existing old buildings in the Modderfontein village in a modernist manner.

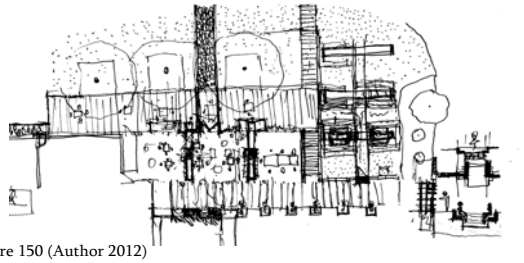


Figure 150 (Author 2012)

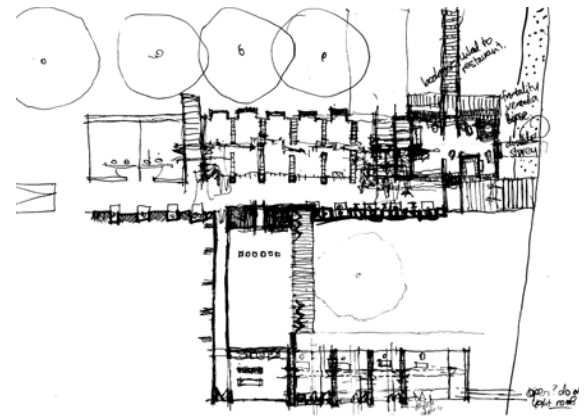


Figure 151 (Author 2012)

- As the design concept progressed, lines of sight or transparency from Christies Hill street towards the west through pathways were depicted.

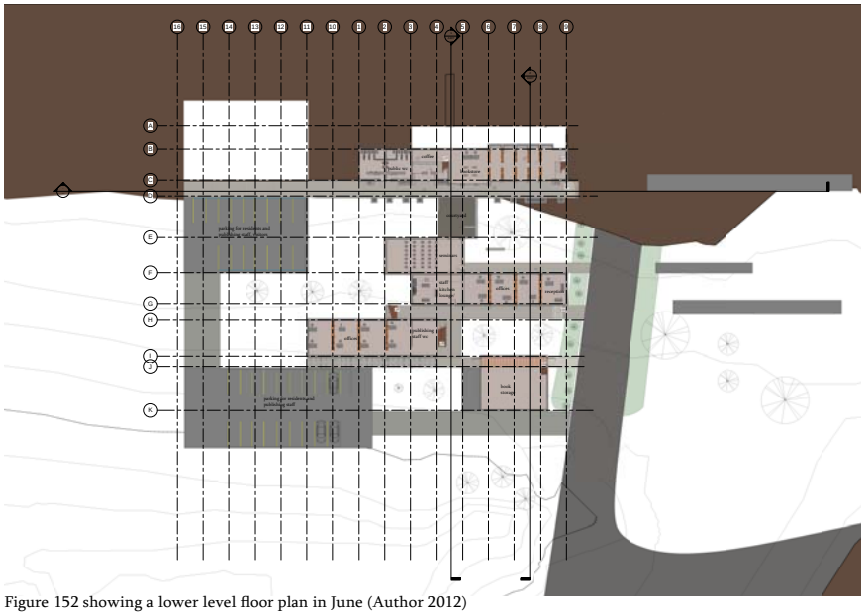


Figure 152 showing a lower level floor plan in June (Author 2012)

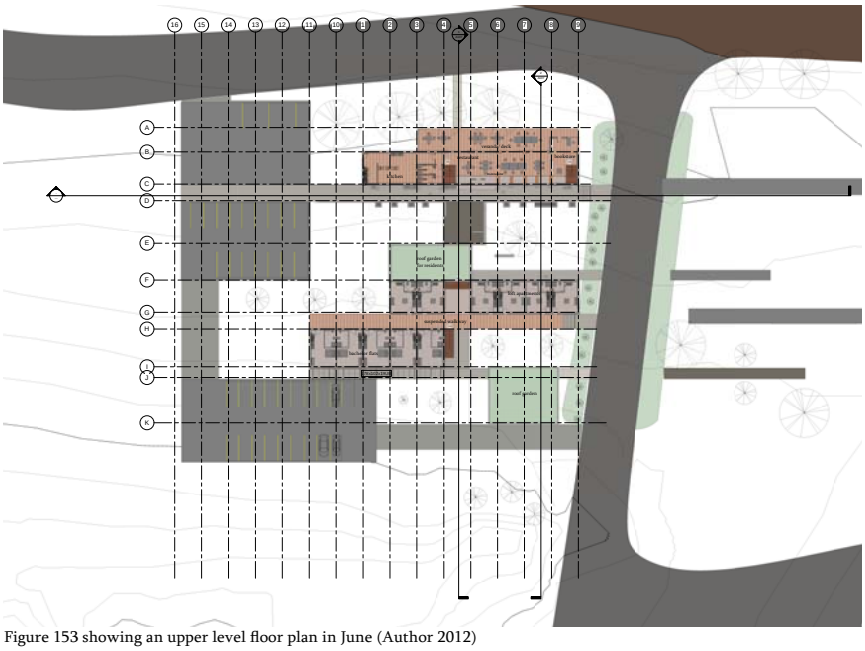


Figure 153 showing an upper level floor plan in June (Author 2012)

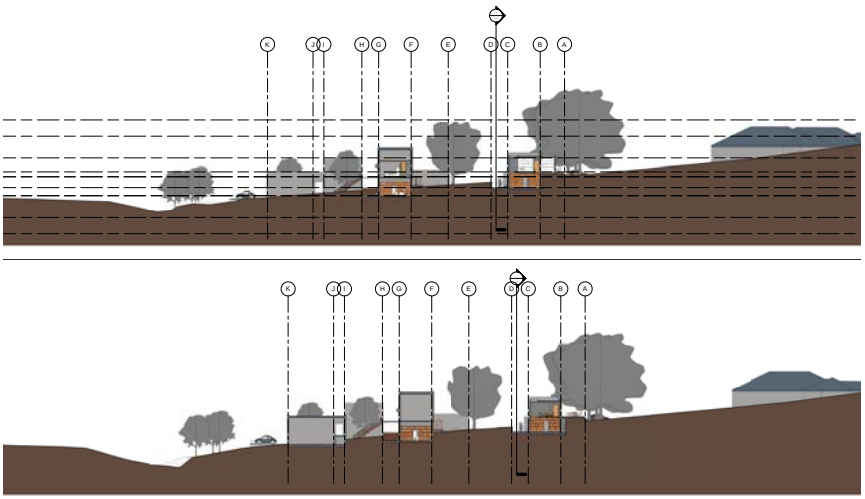
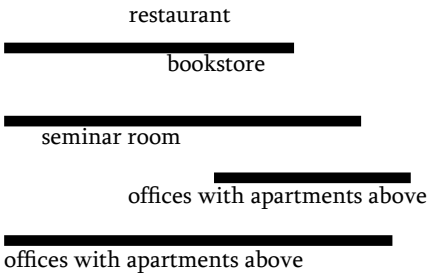


Figure 154 showing sections through the project in June (Author 2012)

- By June 2012, the design concept had changed to a building which follows and flows with the contour lines and almost disintegrates into the landscape.



-All trees are kept in this scheme. New indigenous trees are added.

- The scheme has Apartments, introducing a living and working environment.

- One of the reasons for the design approach based on contour lines was because of the older heritage buildings which follow contours. It was also due to theoretical reading on the landscape and nature and thus appropriating the features of the topography.

There were problems with this approach:

- The building (or series of buildings) was considered too open, and therefore crime and security would be an issue.

-There was also the problem of which entrance to use as there were too many entrances.

- The offices opened out onto the walkways and therefore the practicality of this needed to be reconsidered.

- There was an over emphasis in the design of parking and the motor vehicle with large amounts of unattractive paved parking areas.

- The emphasis should rather be placed on the green open areas between the buildings than on the actual buildings.

- The building was considered too small and simple without enough complexity

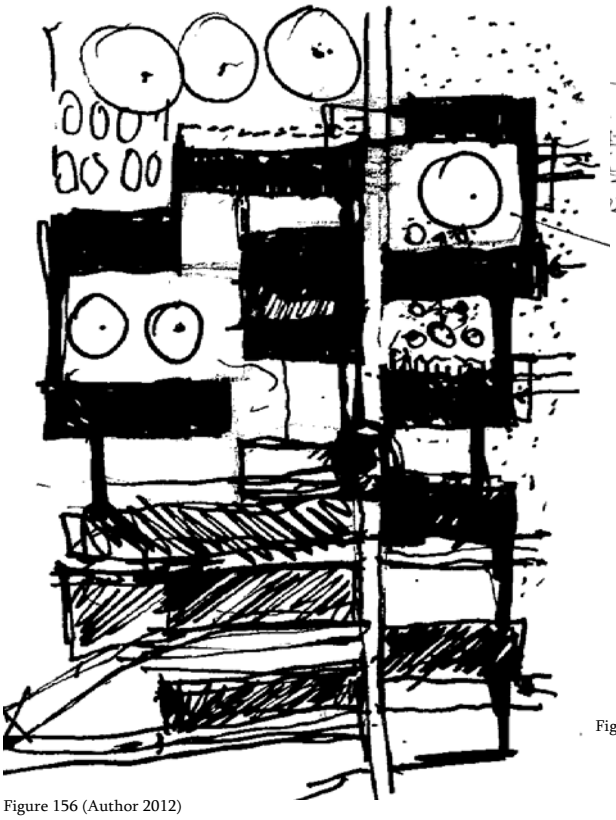


Figure 155 (Author 2012)

Figure 156 (Author 2012)

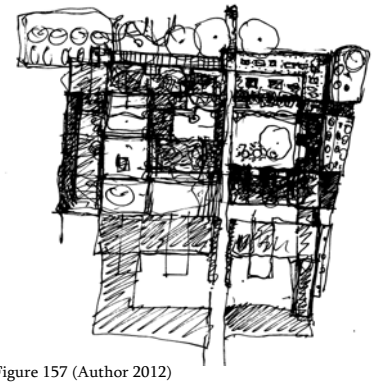


Figure 157 (Author 2012)

Figure 158 (Author 2012)

Figure 160 (Author 2012)

- In order to address issues of crime, the concept sketches done in August depict a building which is enclosed with many courtyards. The building elevations and windows become abstract with windows/glazing from floor to floor or roof slab.

- The buildings have flat roofs, some are planted, some are concrete with gravel chips.

- The courtyards still keep the natural slope of the land and existing trees.

- In the framework there is an Advertising/ Graphic Design Village to the west and a Place of Events/ Markets to the east

- The actual building becomes larger and more complex again (like the initial concept drawings)

- The Bachelor Apartments turn into 'housing units' with at least two bedrooms and undercover parking for a car

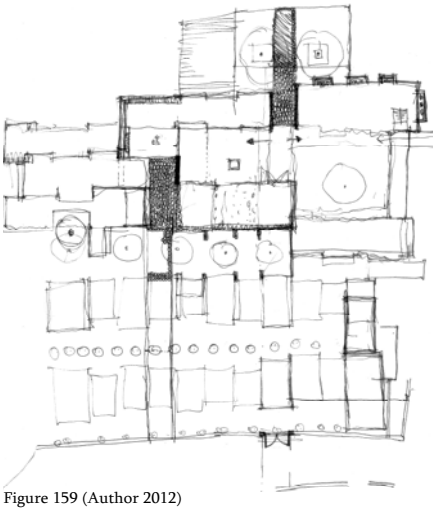


Figure 159 (Author 2012)

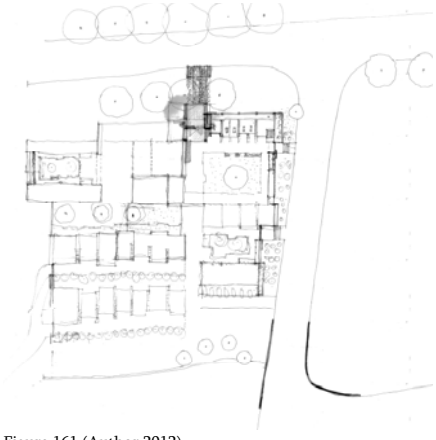


Figure 161 (Author 2012)

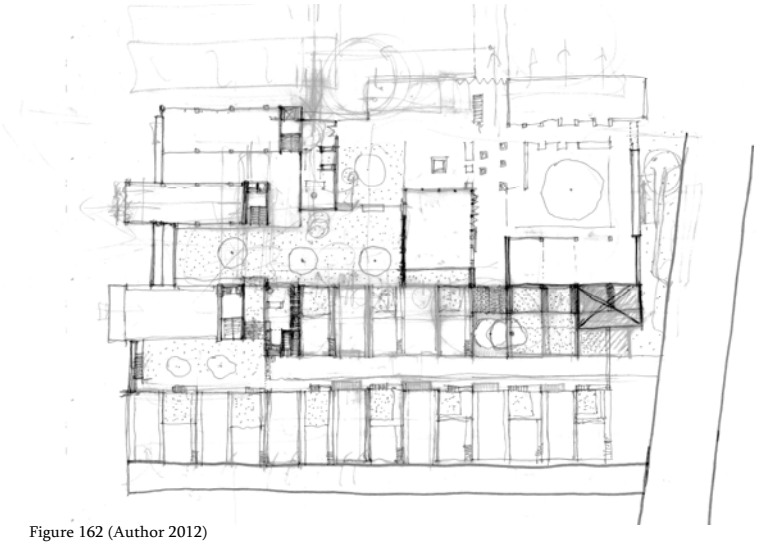


Figure 162 (Author 2012)

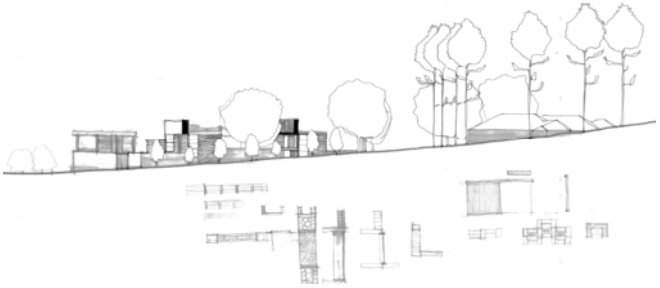


Figure 163 (Author 2012)

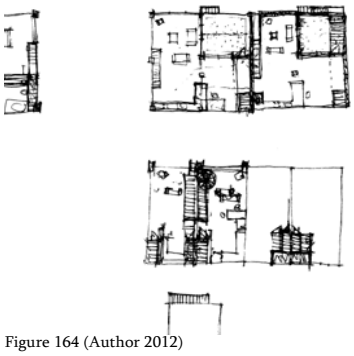


Figure 164 (Author 2012)

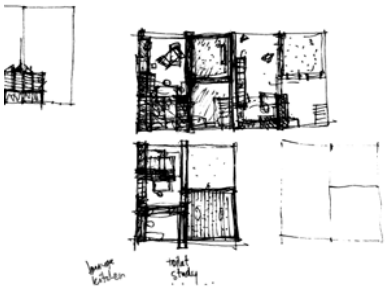


Figure 166 (Author 2012)

- Options were explored on the housing units based on a grid of 5m x 5m. The housing units became L-shaped with terraces/ roof patios and gardens

- Eventually the staircase was moved to the middle of the units (See Figures 163 and 165).

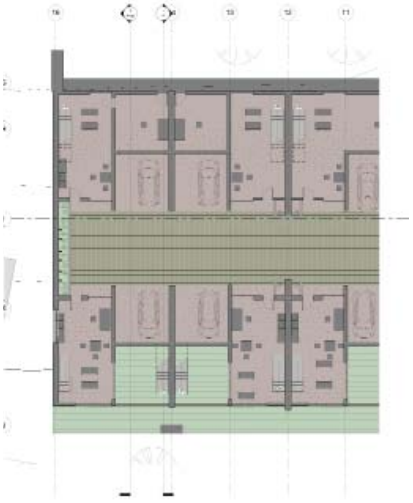


Figure 165 showing housing units in August (Author 2012)

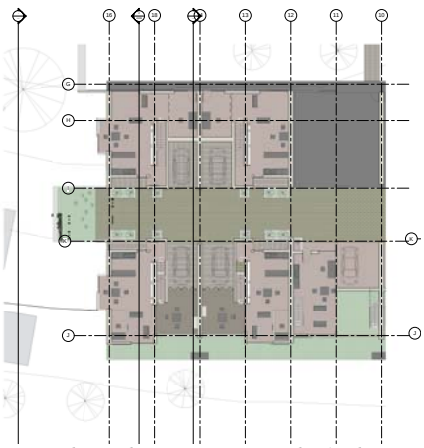


Figure 167 showing housing units in September (Author 2012)

- Design approach still based on contour lines (as the heritage buildings follow contours)

- Design includes courtyards with the natural slope and existing trees.

- The emphasis is placed on the green areas between the buildings and less on the buildings

- The buildings are an extension of the landscape and contain heavy planted roofs and climbing plants.

- The Project becomes a secure and enclosed 'Book Village'

- Offices are shifted to face Main Street and the Residential units are located closer to the river to the south

- The Restaurant is relocated from the edge facing Main Street and becomes internalized. The restaurant faces a courtyard with a large existing tree and has tables under a pergola on the ground floor and on the upper floor.

- Parking areas for cars are paved with grass pavers. Inhabitants of the housing units are encouraged to use public transport, with only 1 Parking Bay allocated per unit (with extra visitors parking). According to the GBCSA (Green Building Council of South Africa) in Multi Unit Residential v1, "One point is awarded where the total number of car parking spaces is at least 25% lower than the maximum local planning allowances applicable to the development or not provided in excess of 1.25 car parking spaces per dwelling..."

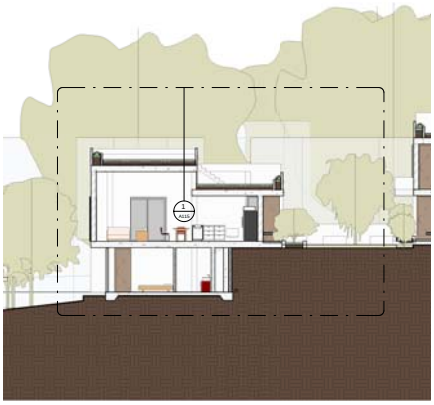


Figure 168 (Author 2012)

Figure 170 showing a lower levels floor plan of the scheme in September (Author 2012)

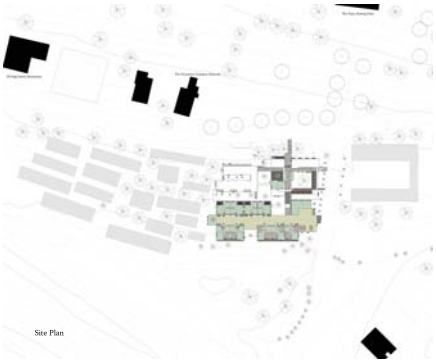


Figure 169 showing a site plan of the scheme in September (Author 2012)

Figure 171 showing a perspective of the front elevation in September (Author 2012)

Figure 172 showing a perspective of one of the courtyards in September (Author 2012)

Figure 173 showing a plan through the upper levels of the scheme in September (Author 2012)

Figure 174 showing sections through the scheme in September (Author 2012)

6.2 Programme & Arrangement

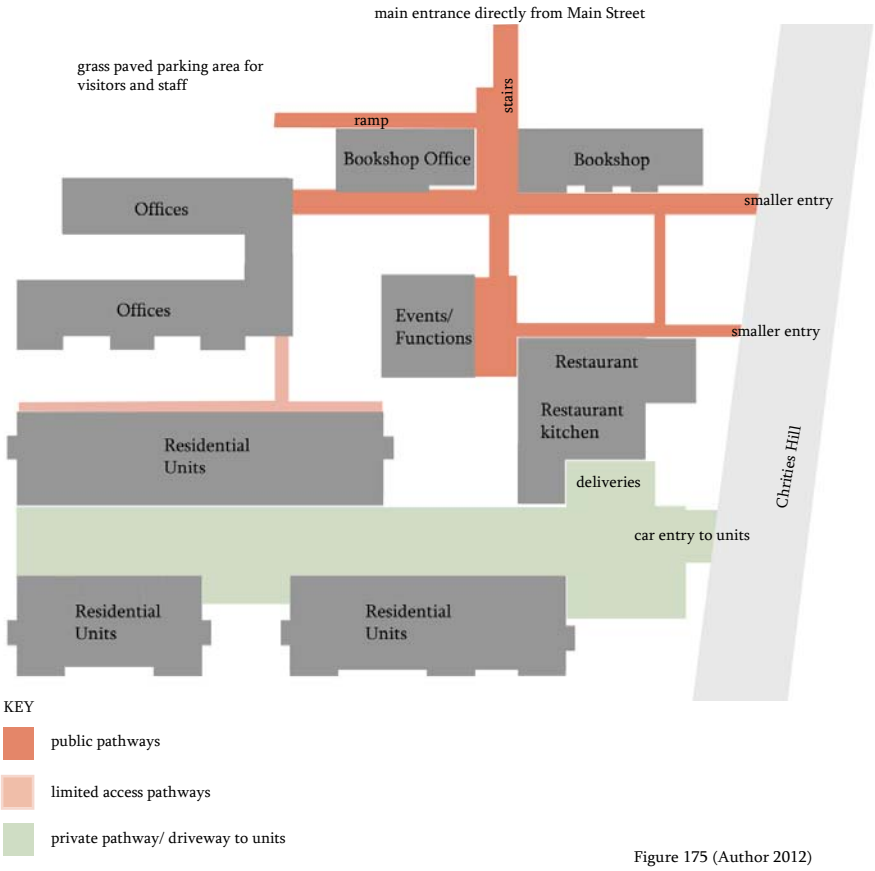


Figure 175 (Author 2012)

The diagram to the left shows the basic spatial arrangements and functions of the buildings in the 'Book Village'. There are several entrances into the scheme. The Main entrance is directly from Main Street.

There are two smaller entrances from Christies Hill Street which lead to the bookstore and the restaurant. There is also a grass paved driveway from Chrities Hill to the Residential Units. This driveway is also used for deliveries to the restaurant kitchen.

All the entrances have large sliding corrugated iron doors, including the entrance to the driveway to the units for security purposes.

- The Building Programme consists of the following:	Approximate areas allocated for functions in the final design
1. Flexible open plan offices for editors, proof-readers, etc working at the publishing house/ or space rented out to various private companies. The offices are double storey, with a small lift and contains bathrooms on each of the levels. The books from the publishing house are printed at the Modderfontein Industrial Complex, therefore the heavy printing equipment and storage is not housed in the scheme.	630 sqm
2. A bookstore which is double-storey and has a mezzanine level looking into the floor level below.	250 sqm
3. Offices for the bookstore with its own toilet, and kitchenette.	80 sqm
4. A take-away coffee outlet rented by a private company.	27 sqm
5. Public toilets including toilets for disabled persons.	56 sqm
6. A Seminar/ Presentation room (with a storage area for equipment) which opens out onto a courtyard.	71sqm + storage (15 sqm)
7. A double storey restaurant with a kitchen containing its own staff toilet and office. There is also a separate delivery access for vehicles and storage areas.	Restaurant 120 sqm kitchen 74 +18 sqm storage 23 sqm
8. A rooftop drinks bar for evening events	30 sqm
9. Nine residential units which are double storey with roof gardens and an undercover parking bay. Some of the residential units have home offices.	Approximately 170- 200 sqm per unit plus roof garden.
10. Parking areas for visitors and for those working in the offices	
11. Many courtyards and outdoor spaces	

6.3 Analysis of layout

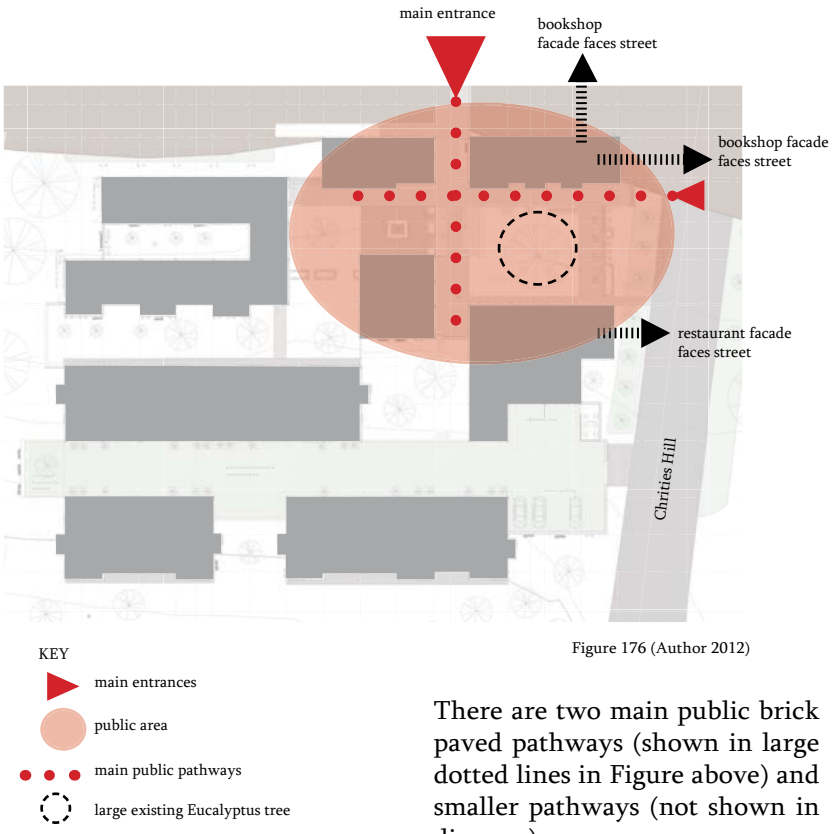


Figure 176 (Author 2012)

There are two main public brick paved pathways (shown in large dotted lines in Figure above) and smaller pathways (not shown in diagram).

The public areas of the scheme are placed near the corner of Christies Hill and Main Street. These public areas include the bookshop, the restaurant, the presentation venue, the public toilets and coffee outlet. This is because of accessibility and visibility from the street. It is important in order to draw visitors to the Book village, that particularly the bookshop and the restaurant are noticeable.

The public areas are designed around a large existing evergreen Eucalyptus tree which becomes the centre of a courtyard. The conference/presentation room is in the middle of the scheme as it lies between the public boundary and the semi-public boundary of the offices or publishing house. The presentation room will be used by those working in the offices and for public events/ talks.

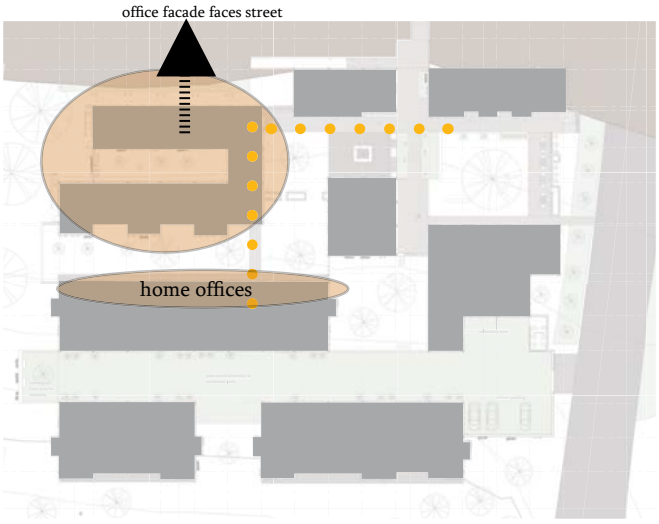


Figure 177 (Author 2012)

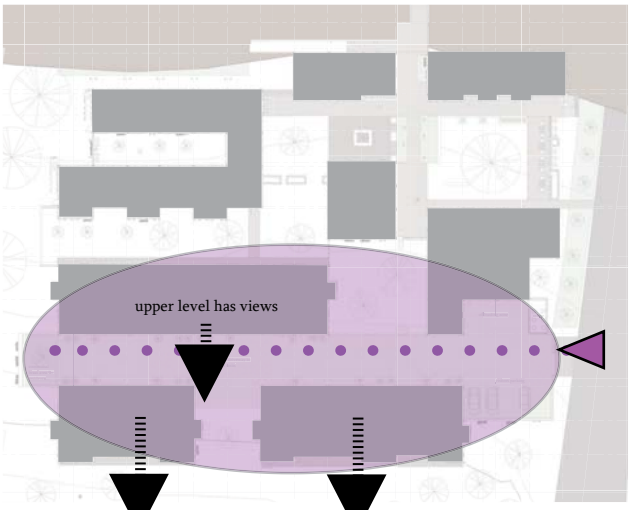


Figure 178 (Author 2012)

The diagram above shows the position of the offices facing Main Street, in close proximity to the grass paved-parking area. Some of the residential units have home offices which are located in close proximity to the other offices. The offices have controlled entry with a reception.

The private areas are shown in the diagram above. Access is limited to inhabitants living in the residential units and to staff working in the restaurant kitchen only. There are boundaries such as walls/ hedges between the public areas with the restaurant and private areas. The residential units are situated at the south of the scheme due to guidelines set up by the author in the proposed framework (See Mapping and Framework Chapter). By placing the units in the current position they also have views south to the river, park and to the landscape beyond.

Figure 179 showing the model in context (Author 2012)

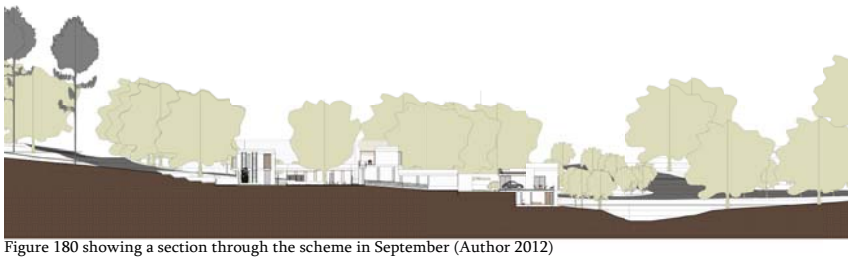


Figure 180 showing a section through the scheme in September (Author 2012)

Figure 181 showing the Southern Elevation in September (Author 2012)

Figure 182 showing a rendering with materiality of the building in September (Author 2012)

Figure 183 showing a rendering of the Front Facade (Northern Elevation) facing Main Street in September (Author 2012)

Figure 184 showing a rendering of the entire project in context in September (Author 2012)

6.4 Materiality

The choice of materials was based on those used in the village. Some of the historic buildings including the Dynamite Company Museum and the previous Single Women's residence have bagged and painted white brick walls. Most of the significant historic buildings in the village were built of brick and clad in corrugated iron for aesthetic reasons.

Heartland Properties have prepared a code of aesthetics for the Modderfontein village (See Mapping and Frameworks Chapter). This specifies that buildings are to be painted white and that the corrugated iron roofs are to be painted green. It stipulates in the Heritage Impact Assessment by R Bosman (2010) that new buildings should adhere to this code.

The external walls in the new structure will be cavity brick walls bagged and painted white within a concrete frame structure. The internal walls will also be bagged and painted white. The roofs are flat with mostly roof gardens. The flat roofs and the use of windows from floor slab to floor slab give the building a very modernist appearance, whilst the bagged brick and the use of corrugated iron shutters, reflects the history of the village.

It was decided that the proposed intervention needed to be minimalistic and by doing that it stands in contrast to the existing detailed and intricate older buildings and houses.

Figure 185 showing the bagged brick wall of a house on the corner of Roper and Anderson Street in Brooklyn, Pretoria (Author 2012)

Figure 186 showing the mix of bagged and plastered wall of a house on the corner of Roper and Anderson Street in Brooklyn, Pretoria (Author 2012)

6.5 Perspectives

The following renderings demonstrate the spatial qualities from the scheme. The building provides walls, trellises and pergolas which allow ivy, and climbing plants to cover vertical areas of the building. There are sitting walls/ benches in the courtyards, and on roof gardens. The courtyards are internalised and secure. There are suspended walkways between various buildings on the second floor.

There are lighter elements such as glass boxes on the front facade (See Figure 187) pergolas and a lighter steel frame on the facade of the offices for sun protection (See Technical Investigation Chapter). These lighter elements facing the street reflect that of the veranda of the Franz Hoenig Haus, the Dynamite Company Museum and other older buildings in the village. There is a ramp for universal access from the main entrance as well as stairs.

Pathways are mostly exposed facebrick, although some are of stone. Planters are made of brick and treated like the walls.

A portion of the plan is demonstrated below where most of the perspectives were taken.

Figure 187 showing a rendering of a courtyard in October (Author 2012)

Figure 188 showing a rendering of a smaller courtyard between the offices and the residential units in October (Author 2012)

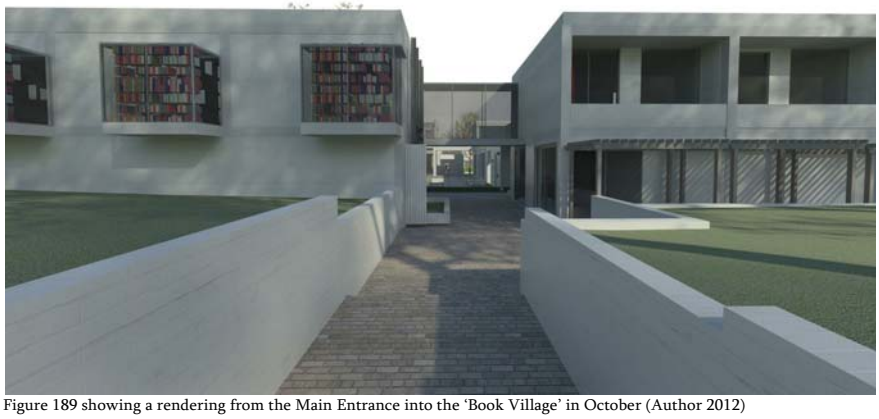


Figure 189 showing a rendering from the Main Entrance into the 'Book Village' in October (Author 2012)

Figure 190 showing a rendering of the main courtyard in the scheme in October (Author 2012)

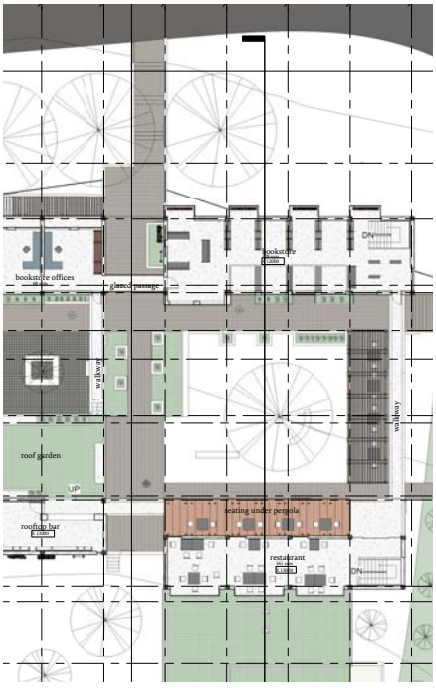


Figure 191 showing a portion of the upper level floor plan (Author 2012)

Figure 192 showing a rendering in October of the interior of the bookstore with books (Author 2012)

The buildings are small and narrow creating intimate spaces inside with a floor to ceiling (underside of the concrete slab) height of 3000mm. The internal floors are powerfloated concrete. Due to guidelines in the Heritage Impact Assessment (Bosman 2010) all walls are painted white.

Figure 193 showing a rendering in October of the courtyard and pergola (Author 2012)

Figure 194 showing a rendering of the east elevation in September (Author 2012)

Figure 195 showing a rendering of the main courtyard in October (Author 2012)

Figure 196 showing a rendering of the main courtyard in October (Author 2012)

Figure 197 showing a rendering of the scheme in context (Author 2012)

Figure 198 showing existing materiality in the Modderfontein Village (Author 2012)

07 Technical Investigation

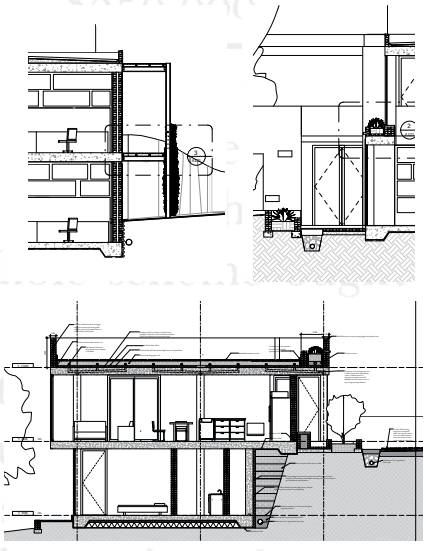


Figure 199 showing technical process work sections (Author 2012)

7.1 Technical Intentions

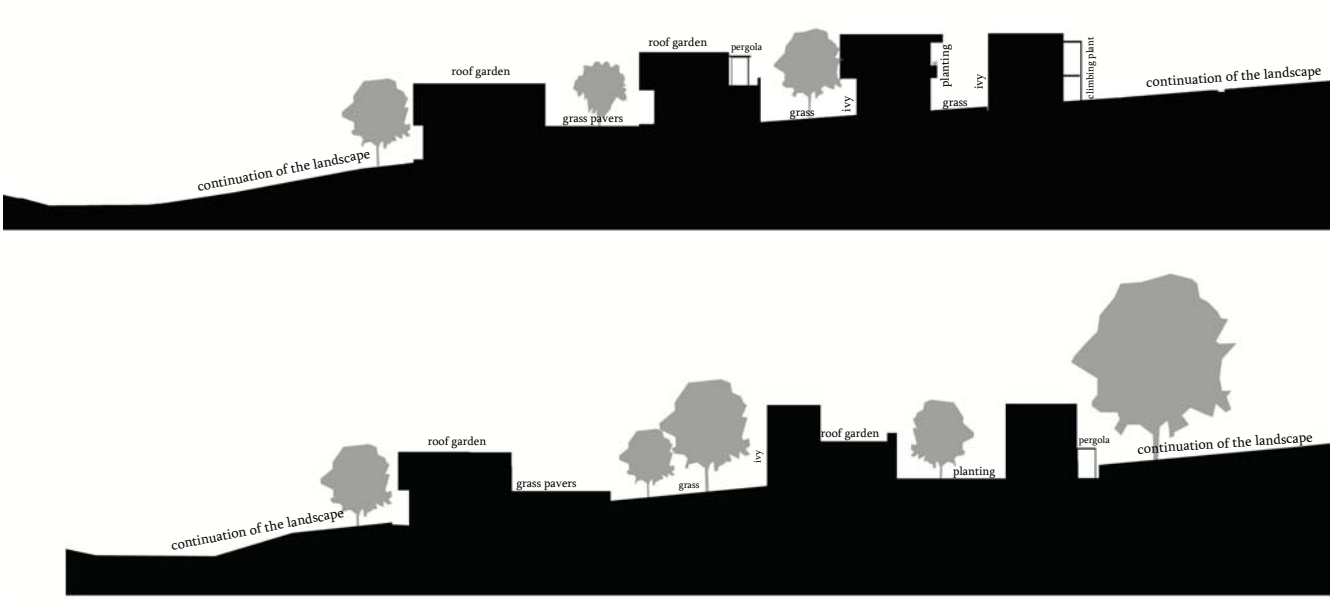


Figure 200 (Author 2012)

The building proposed has a concrete and masonry structure. The building tries to be an extension of the ground and of nature. There are roof gardens, grass paved areas, many trees, natural slope with lawn and trellises for climbing plants. The various buildings in the project mainly follow contour lines (see Figure to the right) on an east-west axis, and the slope with different levels.

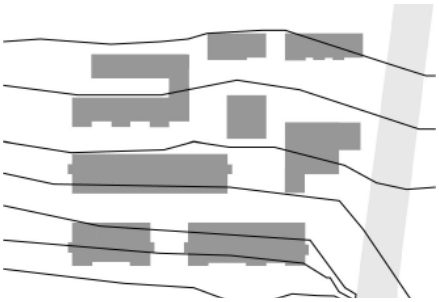


Figure 201 showing how the project follows the contours/ topography (Author 2012)

Within the concrete frame, there are cavity brick walls. The balustrades on roof gardens, terraces and outdoor walkways on the upper floors are also brick walls instead of steel railings or glass.

Since the design approach for the scheme is minimalist, the 'techne' and detailing should be simple, yet refined.

7.2 Primary Structure

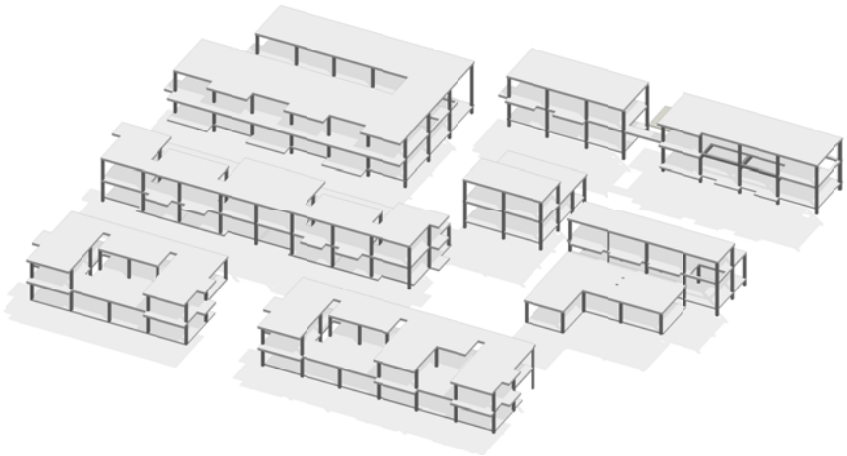


Figure 202 showing the concrete column and flat slab structure (Author 2012)

The proposed project has a reinforced concrete frame structure, with slabs 300mm deep and concrete columns 300mm x 300mm with concrete column footings. The columns are placed on a grid of 5m x 5m, which sometimes alternate to 5m x 6m. The bookstore contains beams 600mm deep to support a mezzanine floor. The ground floor slabs, which rest on compacted soil with a raft foundation to engineers details, are 200mm deep within the 5m x 5m or 5m x 6m grid.

The reason for using a concrete frame structure with brick wall infill as opposed to load-bearing brick walls, is to allow for the use of wide floor to slab window openings.

Using a concrete frame also allows for future flexibility for users to expand or make alterations to the buildings.

7.3 Daylighting and Solar Control

In terms of Solar Control, the project tries to reduce the windows on eastern and western facades, and optimise daylight from northern and southern facades.

Glazing and windows on the northern facade are shaded by horizontal overhangs, trees and pergolas. There are sliding shutters for the residential units designed for windows facing east and west, which can be used to prevent low angle sun. South facing facades in the scheme, particularly the bookstore, have large unshaded windows.

N

Figure 203 showing solar control methods in the project on a diagrammatic plan (Author 2012)

The project aims to achieve a high percentage of Daylight Autonomy. This means that the lux levels from natural daylight in the rooms will be sufficient that electric/ artificial lighting will not be required during the day (see Figure on right).

In order to calculate the lux levels an Ecotect model was built of a portion of the building (of an office).

To calculate the Elevation of the sun and the Vertical Sun Angles during the Solstices and Equinoxes, a solar chart from the Weather Tool with Johannesburg weather data was used. The altitude/ elevation of the sun is needed for calculating the size of north facing overhangs.

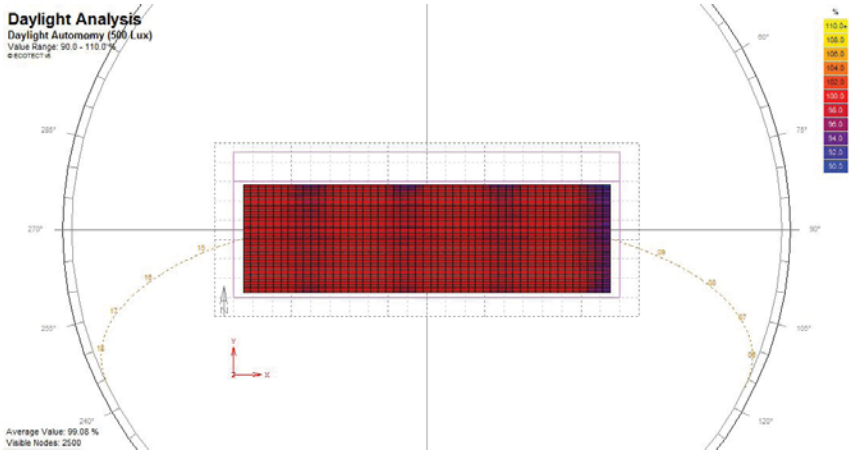


Figure 204 showing an Ecotect model of the office with results of 99% Daylight Autonomy for 500 lux daylight levels (Author 2012)

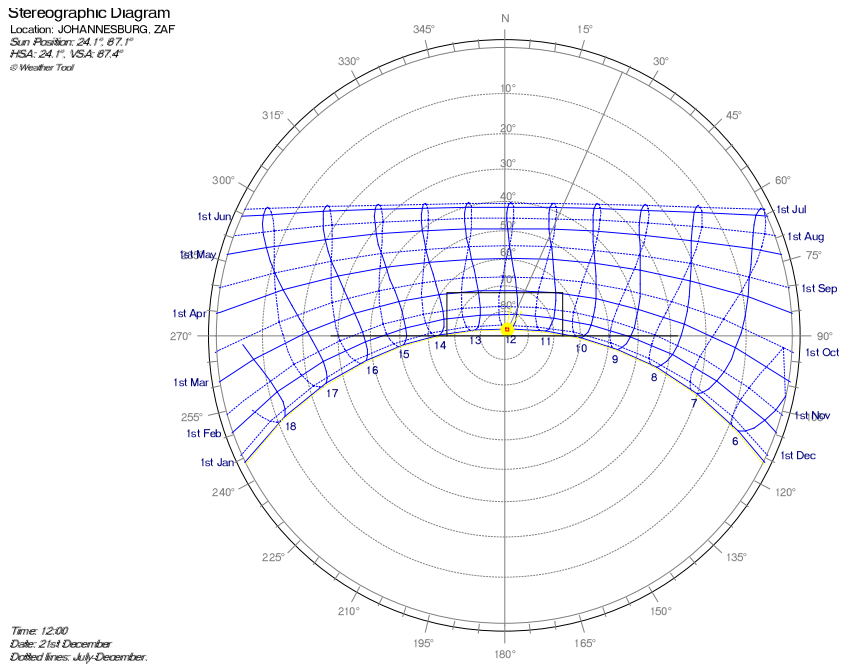


Figure 205 showing a Stereographic Diagram (A Solar Chart) for Johannesburg from the Weather Tool. The chart shows the position of the sun on 21 December at 12:00 (Author 2012)

The results of the vertical sun angle (altitude) calculations from the weather tool for Johannesburg at midday (12:00), when the azimuth angle is zero, are as follows:

Summer Solstice: 87.4 degrees
Autumn Equinox: 64.6 degrees
Winter Solstice: 40.5 degrees
Spring Equinox: 63.3 degrees

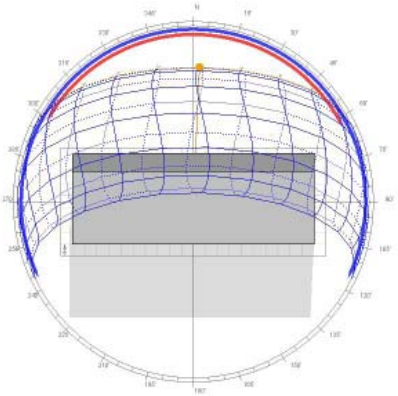


Figure 206 showing a top view of the office with a solar chart and the sun position on 20 June at 12:00 on Ecotect (Author 2012)

The Weather Information for Johannesburg on the Weather tool has the following location data:

Latitude: 26.1
Longitude: 28.2
Altitude: 1700 m above sea level which is applicable to the Modderfontein site

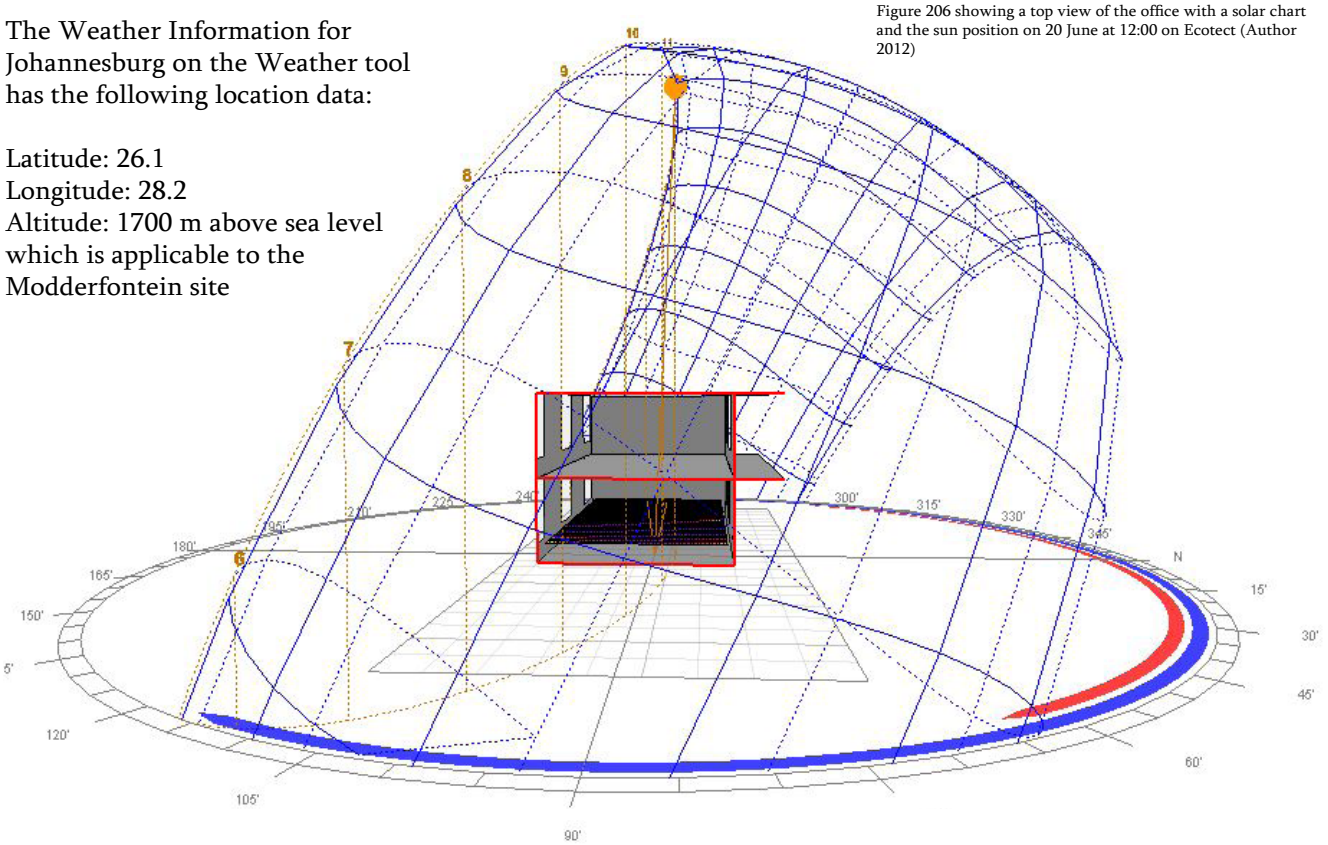


Figure 207 showing an Ecotect sectional model of the office on 21 December at 12:00 with the sun's altitude 87.4 degrees (Author 2012)

Two buildings in the scheme facing Main Street, the office and the bookstore were analysed further in terms of Daylighting Levels and compliance with Daylight Regulations.

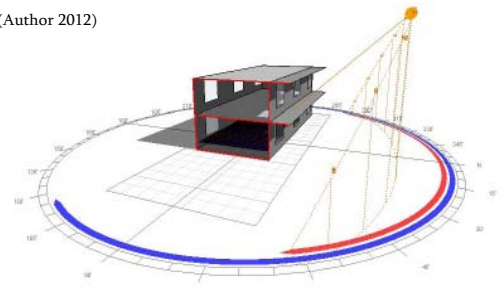


Figure 208 showing the Ecotect model with the sun and shadows on 20 June at 12:00 (Author 2012)

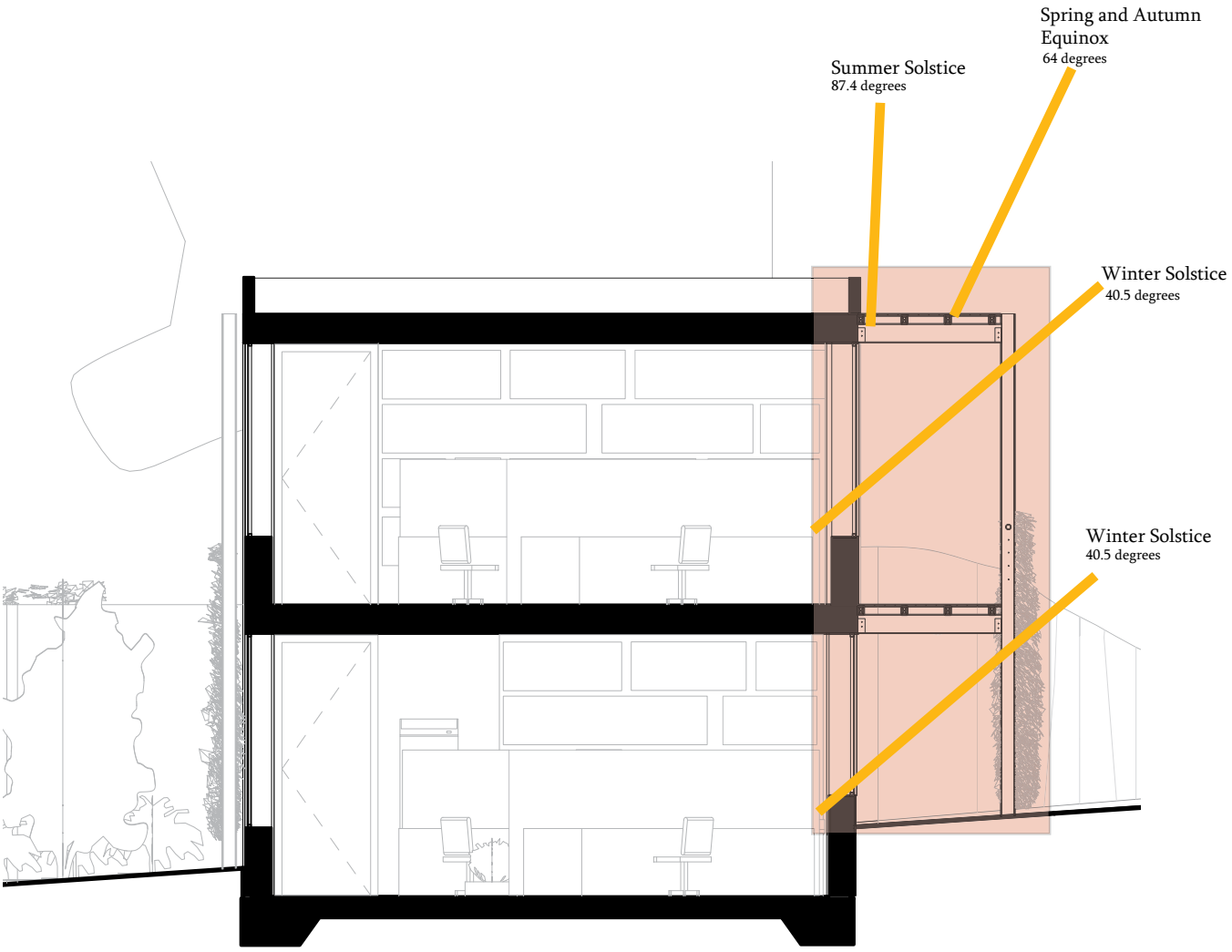


Figure 209 showing a lighter steel structure used to control sunlight entering the Northern Facade of Office 1 (Author 2012)

The office building facing Main Street has northern light control by a lighter steel structure. This structure also functions as a balcony and has steel trellises for climbing plants. The width of the overhangs (1500mm) allows for sun to enter the building only in winter when the angle of the sun is low, and prevents the sun from entering during the other seasons.

The office building is narrow (only 6 m wide) and lies on an east-west axis, and therefore the largest facades face north and south.

For the office ground floor level facing Main Street, the following calculations show that it complies with Daylight Regulations (SANS 10400- O) of at least 10 % of the floor area of the room.

2m x 1,670m x4 windows (north elevation)= 13,36 sqm
2m x 2m x4 windows (south elevation)= 16 sqm
total 29,36 sqm of the total floor area (of office level 1) 112 sqm

=26, 21% of the floor area therefore it complies with regulations

For the office upper level floor facing Main Street, the results were similar

= 28,57 % of the floor area therefore it complies with regulations

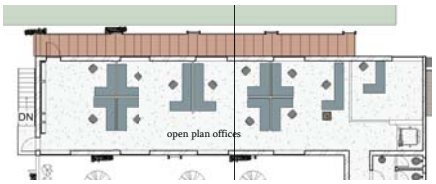


Figure 210 showing a portion of the upper floor plan of the office facing Main Street with similar daylight conditions to that of the ground floor (Author 2012)

Figure 211 showing a draft computer perspective of the lighter steel structure of the office facade (Author 2012)

Figure 212 showing a draft computer perspective of the lighter steel structure of the office facade (Author 2012)

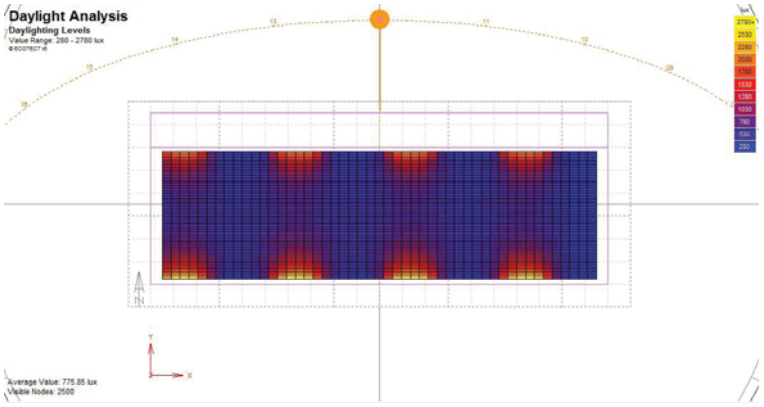


Figure 213 showing a Daylight Analysis Ecotect model for the ground floor office facing Main Street (Author 2012)

The Ecotect model calculated the lux levels for the bottom level of the office shown above, resulting in an average of 775.85 lux under an overcast sky with a Sky Illuminance of 10 500 lux from 8am-5pm. The result for the floor above it is 768.24 lux.

"The CIBSE Code for Lighting recommends a maintained illuminance of 500 lux for general offices". This means that the office has adequate natural daylighting that artificial lighting will not be required during 8-5pm.

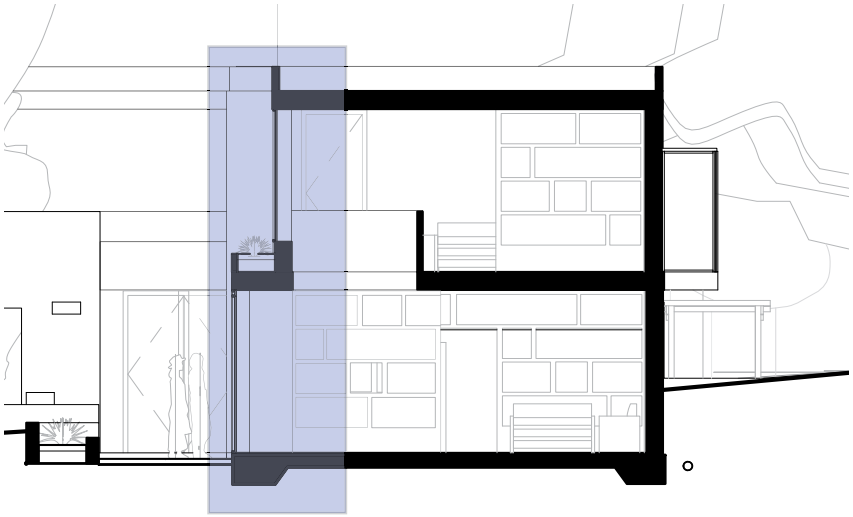


Figure 214 showing the glazing on the Southern facade of the bookstore (Author 2012)

The bookstore takes advantage of southern light. The bookstore is also narrow (6m wide) and lies on an east-west axis.

Daylight calculations were done on the lower level which shows that the buildings complies with SANS 10400 regulations.

2m x2,7m x6 windows (south elevation)= 32,4 sqm
2,7m x0,5m x1 windows (west elevation)= 1,337 sqm
2,7m x1m x1 window (west elevation)= 2,7 sqm
1,8mx1,16m x 1 window (east elevation)= 2,08 sqm
total 38.51 sqm of the total floor area (of bookstore level 1)120 sqm
=32,78% of the floor area therefore complies

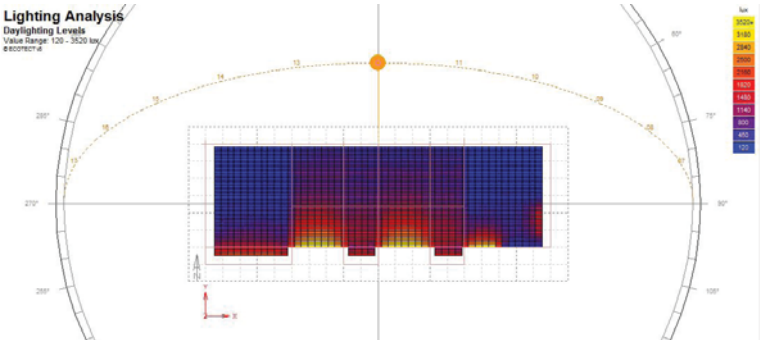


Figure 215 showing a Daylight Analysis Ecotect model for the ground floor of the bookstore (Author 2012)

The Ecotect model calculated the lux levels for the bottom level of the bookstore resulting in an average of 865.65 lux under an overcast sky with a Sky Illuminance of 10 500 lux from 8am-5pm throughout the year.

CIBSE recommends an illuminance of 500 lux for Bookshops. This means that the bookshop has adequate average daylighting during the day. A Daylight Autonomy model shows an average of 95,4% for 500 lux for the bookshop.

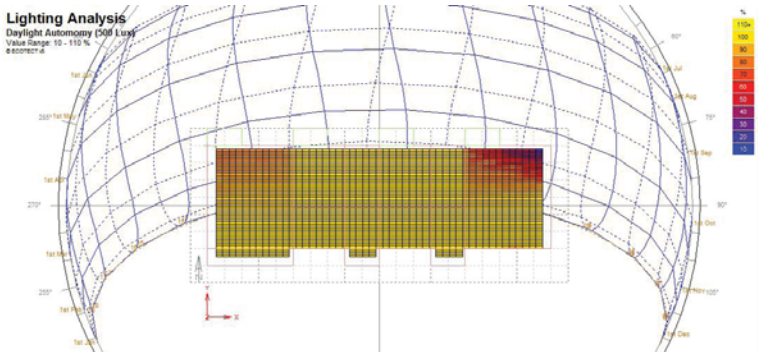


Figure 216 showing a Daylight Autonomy model of the Bookstore with results of 95,4% Average Daylight Autonomy for 500 lux daylight levels (Author 2012)

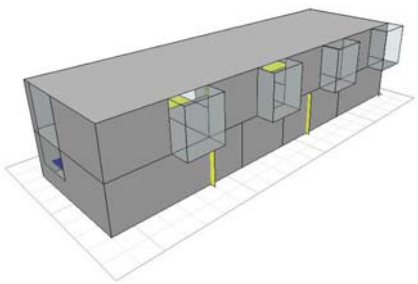


Figure 217 showing an Ecotect model of the Bookstore (Author 2012)

7.4 Rainwater

Figure 218 Jojo Underground 6000 litre Tank (image from http://www.jojotanks.co.za)

The flat roofs of the bookstore, bookstore offices and of the Publishing House offices can be used to collect rainwater. The water from these roofs flows into water outlets and rainwater downpipes in the concrete columns and later can be stored in tanks at ground level. This water may be used to water the gardens during the dry winters that Johannesburg experiences.

The area of the office roof is 371sqm and Johannesburg receives about 604mm of rain per year. This means that there is 224 084 litres collectable rainwater per annum. The storage tank is 5% of annual rainwater yield = 11 204 litres. Therefore a 12 000 litre storage tank is required. It is proposed to use 2 Jojo Underground 6000 litre Tanks for the offices, placed in the garden.

The area of the bookstore roof and bookstore offices roof is 203 sqm, with a storage tank of 6130 litres required in order to collect 5% of the annual rainwater yield. Therefore 1 Jojo Underground 60000 litre Tank is to be used.

7.4 Stormwater

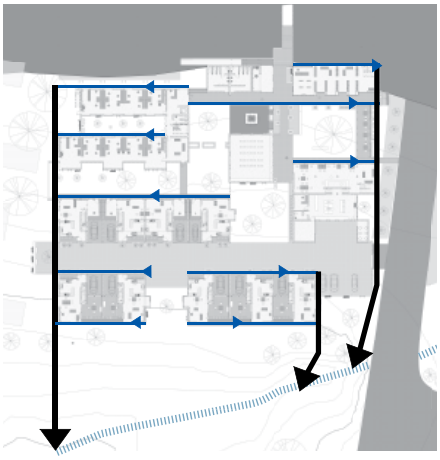


Figure 220 (Author 2012)

The site is on a slope with a river to the south of the site. It is proposed that through a system of agricultural drains for subsoil conditions, water channels/trenches (with steel gratings), and precast concrete kerbs to fall, and larger underground pipes the water is transported back to the river. Reno mats consist of woven mesh that are filled with stones to prevent erosion particularly for river banks and embankment stability. Reno mats will be used in the project for the discharge of water from underground pipes towards the river.

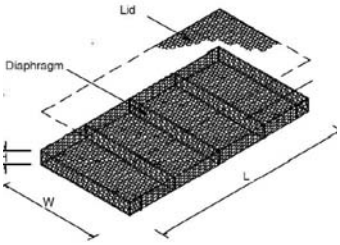


Figure 219 showing a Reno Mattress (image from http://www.maccaferri.co.nz)

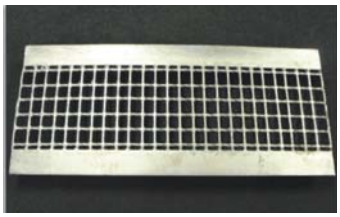


Figure 221 showing a Stainless Steel Flanged Trench Cover (image from http://www.gratingworld.co.za)

7.5 Universal Access

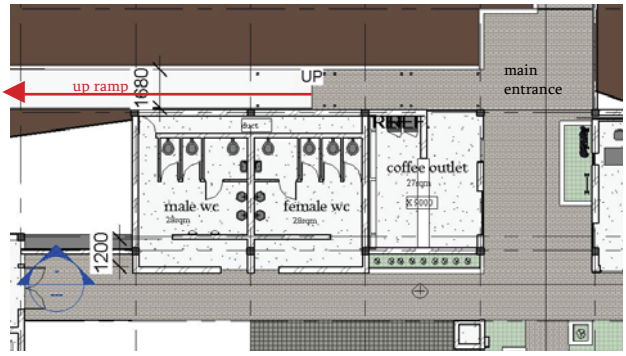


Figure 222 showing the ramp at the entrance to the 'Book Village' and the public bathrooms with facilities for persons with disabilities (Author 2012)

Facilities for persons with Disabilities include 2 separate public 1800mm x 1800mm toilet compartments for male and female. These toilets are fitted with adequate grab rails, wash hand basins, mirrors and vanity shelves. The width of the entrance and the entrance corridor to the bathrooms is 1200mm.

There is also a ramp from the visitors parking area to the entrance and flat paved surfaces inside the scheme, which allow for universal access to the restaurant, the bookstore bottom level, the coffee outlet, the presentation room and to the offices. The width of the ramp is 1680mm which complies with the following SANS 10400- S Regulation:

"4.8.2 Any ramp provided in terms of this part of SANS 10400 shall
b) have a clear, trafficable surface not less than 1 100 m wide;"

The offices are double storey, therefore a small lift has been provided.

7.6 Fire Services and Escape Routes

The project includes the following classifications for occupancy according to SANS 10400 Regulations:

A1- entertainment and public assembly
F2- Small shop
G1- offices
H4- Dwelling House

The fire fighting equipment required for the project:
-The presentation room (A1): 1 portable fire extinguisher
-The bookshop (F2- small shop as it is 250sqm): 2 portable fire extinguishers
-The double storey offices of the publishing house (G1): 2 portable fire extinguishers for each floor and one hose reel in total.
-The restaurant kitchen (A1): 1 portable fire extinguisher
-For the residential units it would be preferable if each unit had its own portable fire extinguisher.
-Neither a fire sprinker system nor a fire hydrant is necessary for the scheme.

Figure 211 showing a Natex portable fire extinguisher (image from www.natex.co.za)

Natex Portable fire extinguishers, with 4.5kg dry chemical powder will be provided, which comply with Table 11 of SANS 10400-T standards (see Figure above).

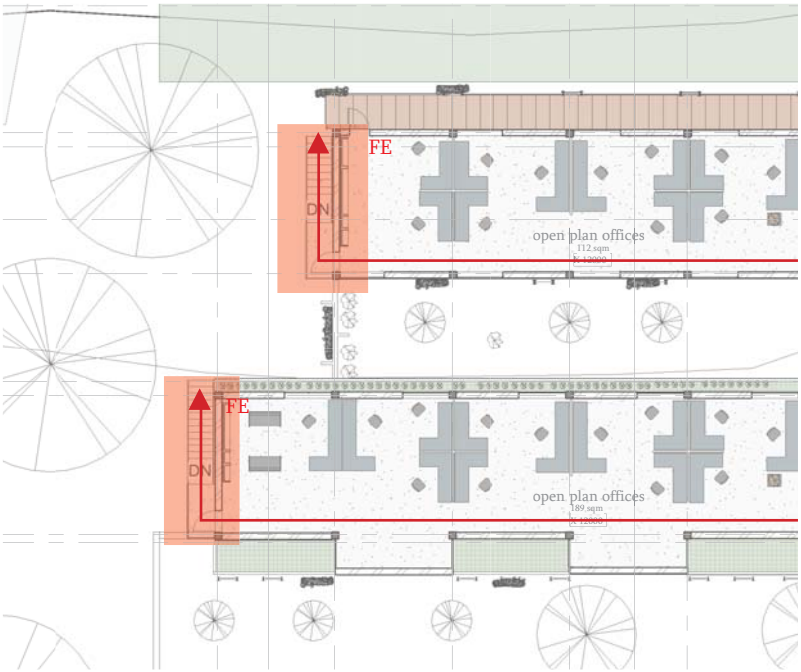


Figure 212 showing the upper floor of the offices with fire escape routes and Fire Extinguishers (Author 2012)

The safety distance between the two offices (closest buildings to each other in the scheme) is calculated as follows:
- Area of openings of the office elevation is 32sqm which has a minimum distance of 3,8m for G1 in SANS 10400-T. In the design there is a 5m distance between the two offices, therefore the building complies with regulations.

External staircases have been provided for the publishing house offices on the second storey and for the offices of the bookstore which form part of a fire escape route to the ground floor. These routes have a hinged door which opens outwards, with solid treads and risers (SANS 10400-T).

The walls of the project are non-load bearing, and all external walls are cavity clay brick walls and internal walls are double skin brick walls. The fire rating of the walls (cavity and double skin) is 240 minutes. No circular staircases have been used in the scheme due to fire regulations.

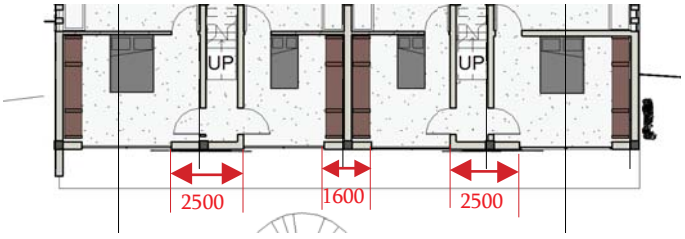


Figure 213 showing a portion of the lowest level plan of the housing units to show the distance between windows (Author 2012)

The portion of the lower level residential units plan shows that the flame path travel from windows between different rooms is larger than 1000mm therefore it complies with Part 4.10 Protection of Openings in SANS 10400-T. The other openings in the scheme comply with this regulation as well.

7.7 Ventilation

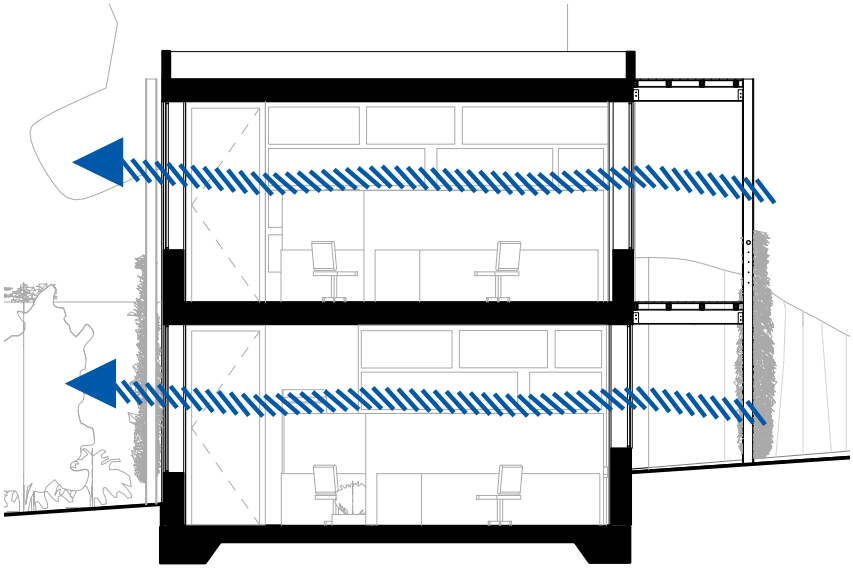


Figure 214 showing ventilation through the offices (Author 2012)

Most of the buildings in the scheme are narrow (less than 6m wide) and use natural ventilation.

The offices use cross-ventilation to ventilate the rooms, with the building being only 6m wide.

Calculations were done based on the size of the openable windows of the office ground level facing Main Street. The windows are aluminium sliding windows.

1m x 1,670m x 4 windows (north elevation)= 6,68sqm
1mx 2m x 4 windows (south elevation)= 8sqm
total 14,68m2 of the total floor area (of office level 1) 112sqm
=13,1% openable windows therefore complies with SANS 10400 Regulations

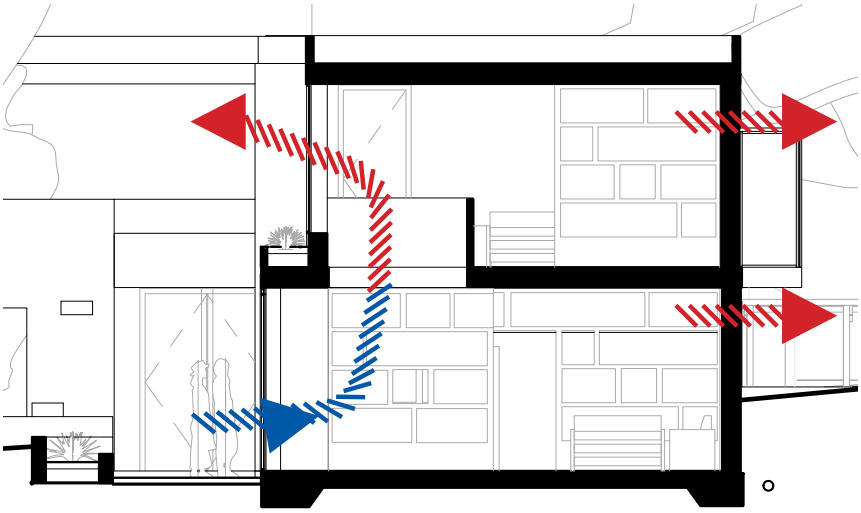


Figure 215 showing ventilation through the bookstore (Author 2012)

The bookstore uses a combination of Cross Ventilation and Stack Ventilation with lower and higher openings and ventilation grilles. Cool air enters the building through lower openings, heats up and rises through the large opening in the floor and escapes through higher openings. As the air heats up and rises, more air is drawn in from the lower areas through the floor opening.

The residential units, the restaurant and the restaurant kitchen also use cross ventilation.

7.8 Thermal Performance

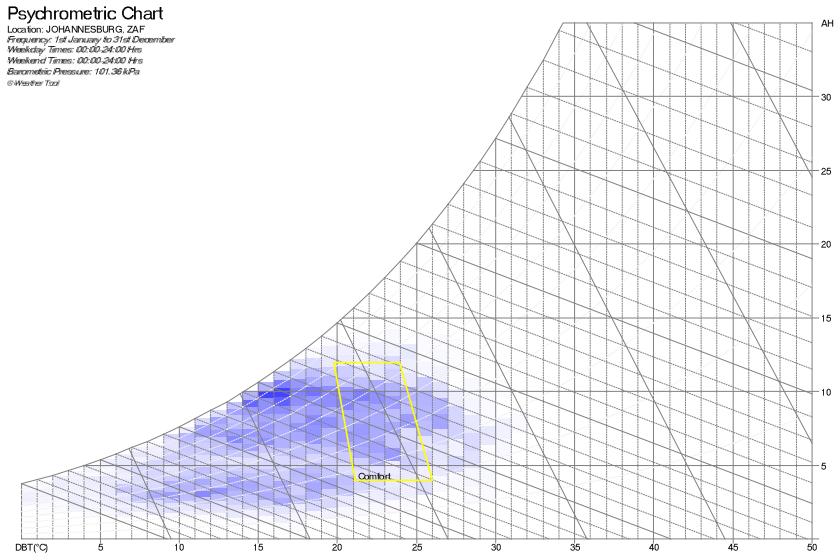


Figure 216 showing a Psychrometric chart from the Weather Tool shows the Comfort Range between 20- 26 degrees celcius) depending on the Average Humidity (image from the Weather Tool)

Ecotect Thermal Analyses were done on the office and the bookstore to determine internal temperatures during the year. It was found that on average on 21 December at 12:00 temperatures are 22.12C (in the office) which are in the comfort range. However in winter the internal temperatures (in the offices) at 12:00 decreases to 14C or lower. Similar conditions occurred in the bookstore. These calculations were based on cavity brick wall external walls and flat concrete roofs.

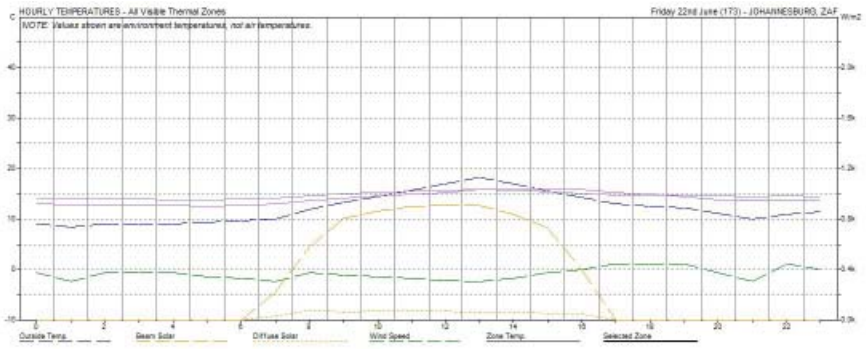


Figure 217 showing an Ecotect Thermal Analysis of the office (Author 2012)

Table 1 — Minimum total R-values for external walls with density > 300 kg/m² and internal masonry with density > 150 kg/m²

1	2	3	4	5	6	7
Occupancies	**R-value** $m^2 \cdot K/W$					
	Climatic zone					
	1	**2**	**3**	**4**	**5**	**6**
Low rise office blocks	1,4	0,9	0,4	0,6	0,6	1,4
Strip shopping malls	1,4	0,9	0,9	0,9	0,6	1,4
Clinics	1,4	0,9	0,9	0,9	0,9	1,4
Schools	1,4	0,9	0,9	0,6	0,6	1,4
House ≤ 132 m^2	1,4	0,9	0,4	0,9	0,6	1,4

Figure 218 showing an excerpt from SANS 204 (SANS 204-2: 7)

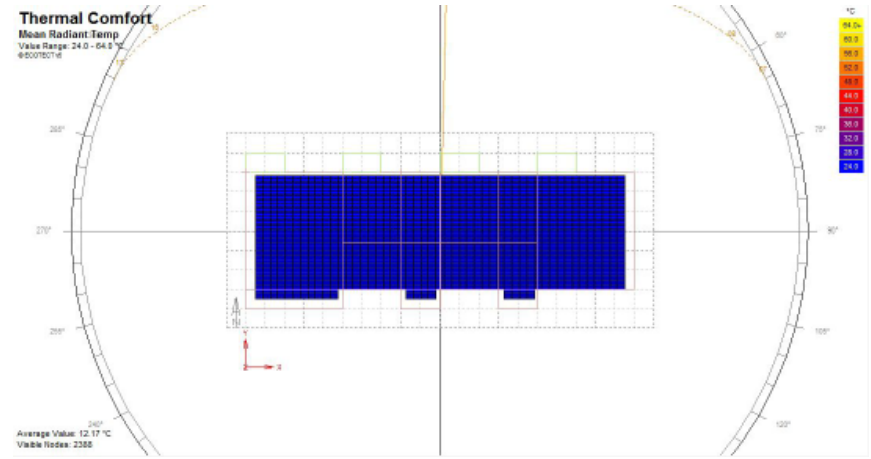


Figure 219 showing an Ecotect Thermal Analysis of the bookstore (Author 2012)

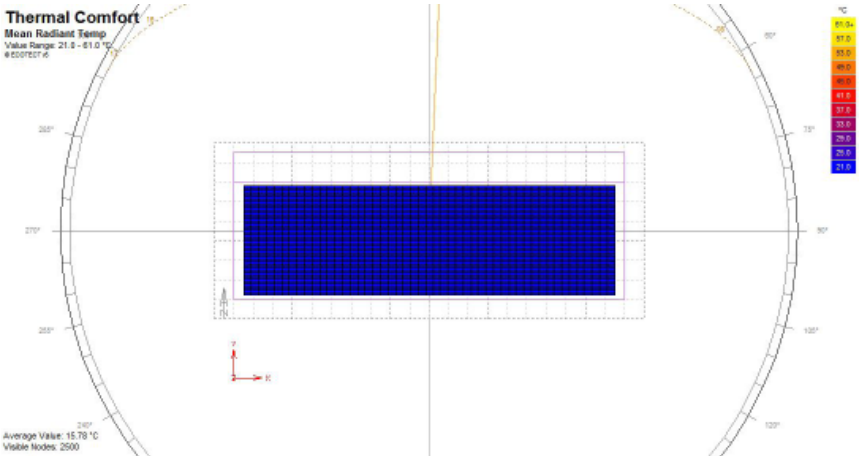


Figure 220 showing an Ecotect Thermal Analysis of the office (Author 2012)

According to SANS 204, Johannesburg falls within Climate zone 1, Cold Interior. The Minimum total R-value for external walls with a density greater than 300kg/m2 (such as cavity brick walls) is 1,4 for low rise offices. A cavity brick wall has a U-value of 1,47 W/m2 which equals an R-value of 0,68. This means that the cavity brick walls need to have insulation for the offices.

If 30mm Isoboard cavity wall insulation is placed on the internal leaf of the brick cavity, the R-value of the wall is increased to 1,45. Isoboard Insulation consists of extruded polystyrene rigid foam board.

The R-Values of the concrete roofs with roof Gardens with 200mm thick soil and grass have a higher thermal resistance than that of exposed concrete roofs. The flat concrete roofs in the project either are covered with a layer of stonechips or have roof gardens.

To improve the internal temperatures in winter some options are suggested by the author. These include insulating the cavity brick walls, double glazing on southern facades and using flat plate solar collectors on the concrete roof of the offices, which heat water. This water is then run through pipes in the floor slab, called Hydronic heating. This system is called Thermally Activated Building Systems.

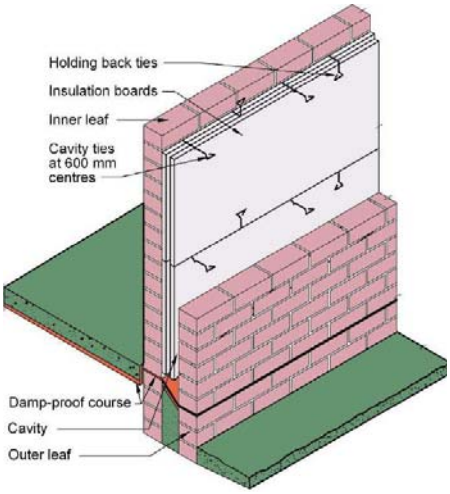


Figure 221 showing Isoboard Cavity Wall Insulation (image from http://www.isoboard.com)

7.9 Technical Drawings

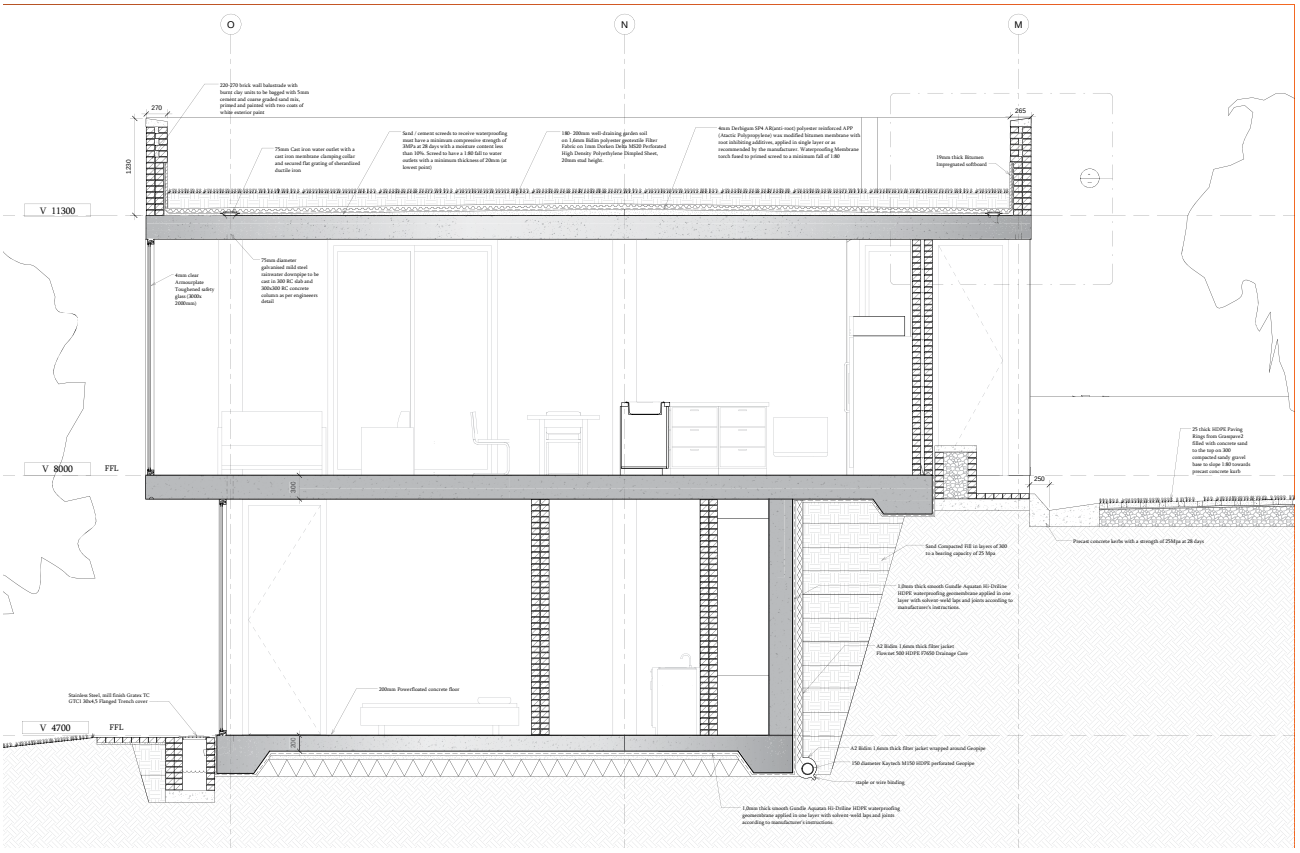
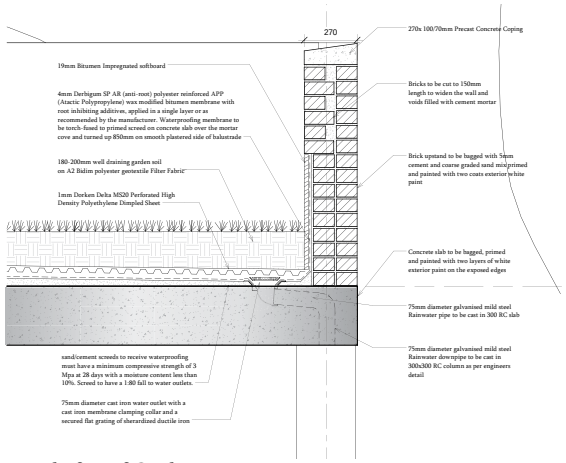
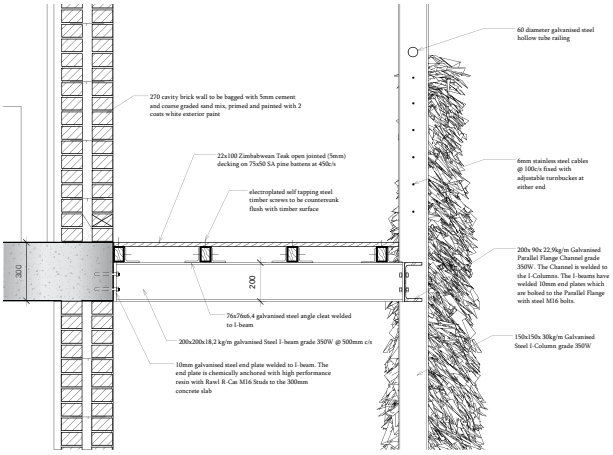


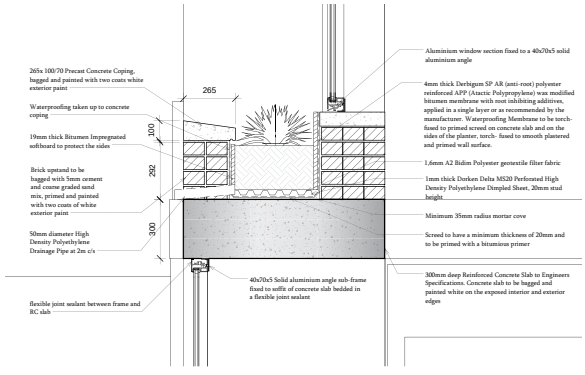
Figure 222 showing a Section through a Residential Unit (Author 2012)



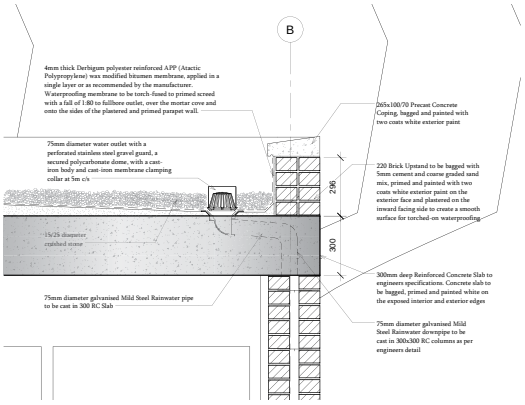
Detail of Roof Garden
scale 1:10



Detail of Office Facade
scale 1:10



Detail of Bookshop planter
scale 1:10



Detail of Parapet Wall
scale 1:10

Figure 223 showing technical details (Author 2012)

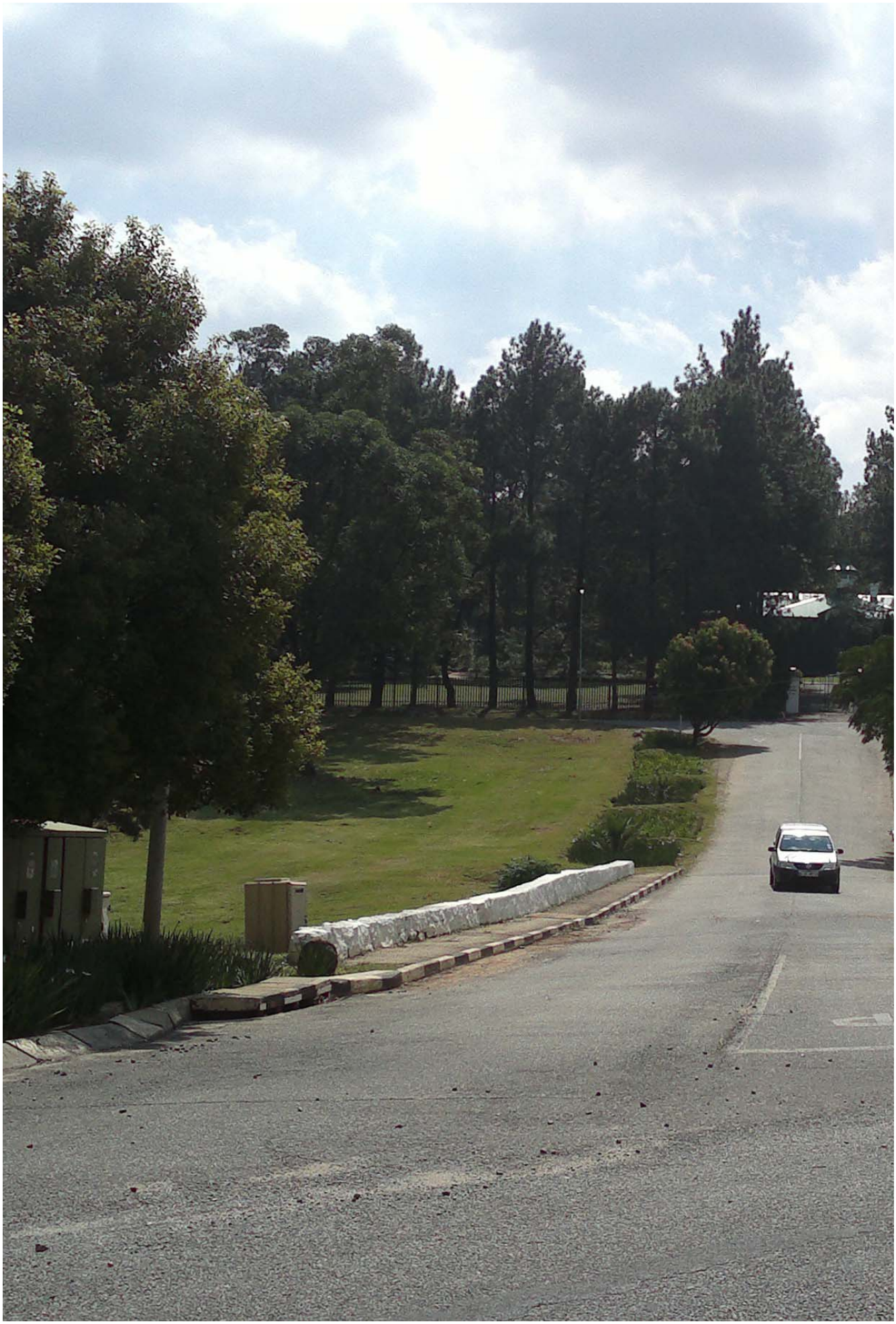


Figure 224 (Author 2012)

08 Conclusion

Figure 225 (Author 2012)

Figure 226 showing a rendering of the building in the landscape (Author 2012)

8.1 Conclusion

The study investigated a design intervention to the village of Modderfontein, an area containing historically significant buildings that were occupied by those who worked and managed the first Dynamite Explosives Factory in South Africa.

Figure 227 showing the old Casino in Modderfontein (Author 2012)

It is seen in Spatial Development Frameworks for Modderfontein that there is a proposed Gautrain station and general future densification of the area. The author proposed densifying the village with a series of public, office and residential buildings in clusters to the south of the First Factory Manager's House. The author focused on one group of buildings, a 'Book Village'.

An extensive study of the history of the Modderfontein factory, village and landscape was conducted.

Figure 228 showing the entrance to the Franz Hoenig Haus (Author 2012)

There were various guidelines set in the Heritage Impact Assessment (Bosman 2010) and from the Code of Aesthetics prepared by the landowners (Heartland Properties) that were followed for an appropriate design solution.

The aim of the project was to densify the village but also to retain as many green areas and existing trees as possible. The proposed project has many green areas and courtyards, as well as roof gardens. The design aim was to find a contemporary and contrasting solution to the existing older buildings for historical clarity. The proposed project is minimalistic, understated and strives to be contextually relevant.

Figure 229 showing the Main Street and the site where the Book Village is located (Author 2012)

Figure 230 showing the Main Street and the site where the Book Village is located (Author 2012)

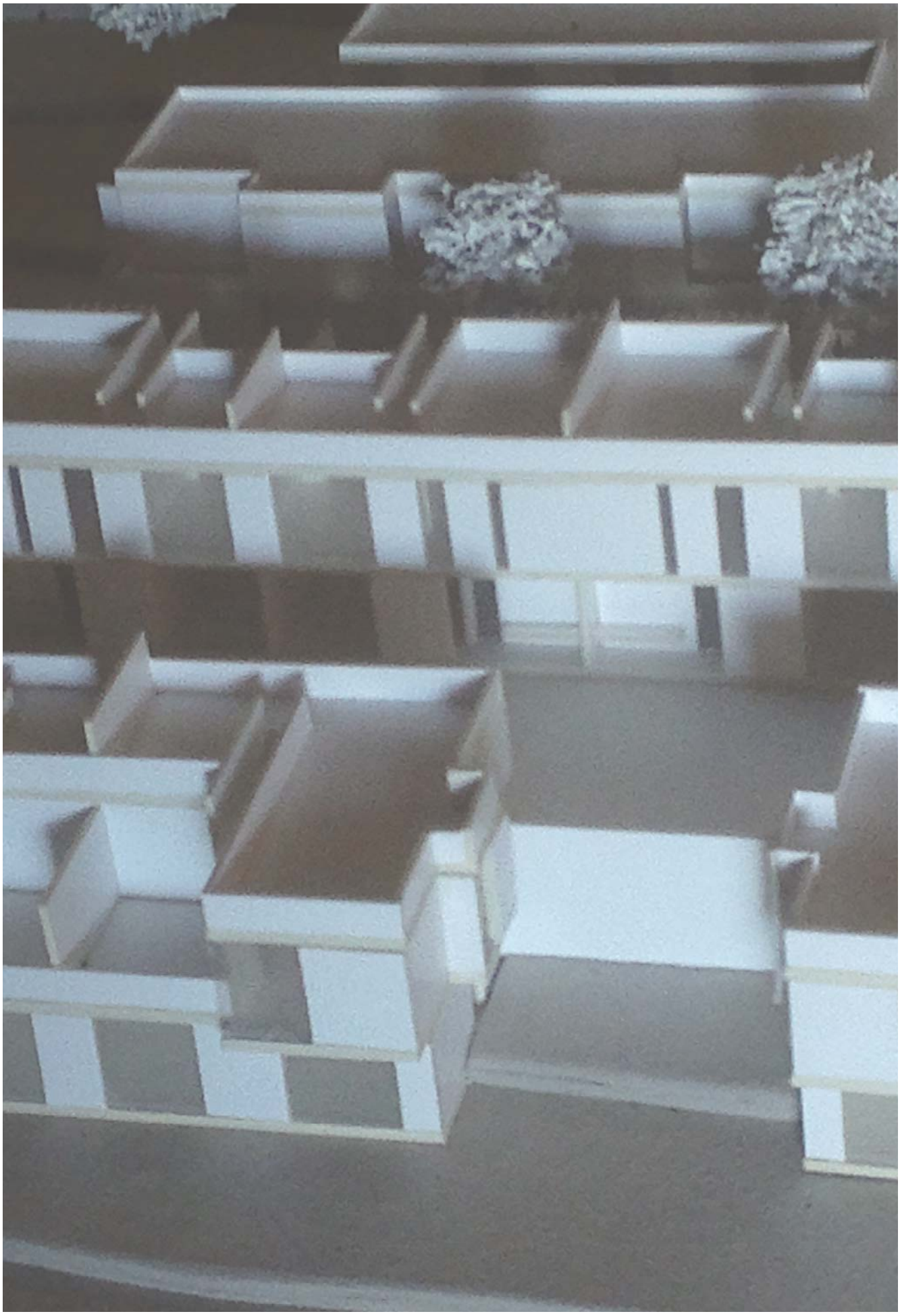
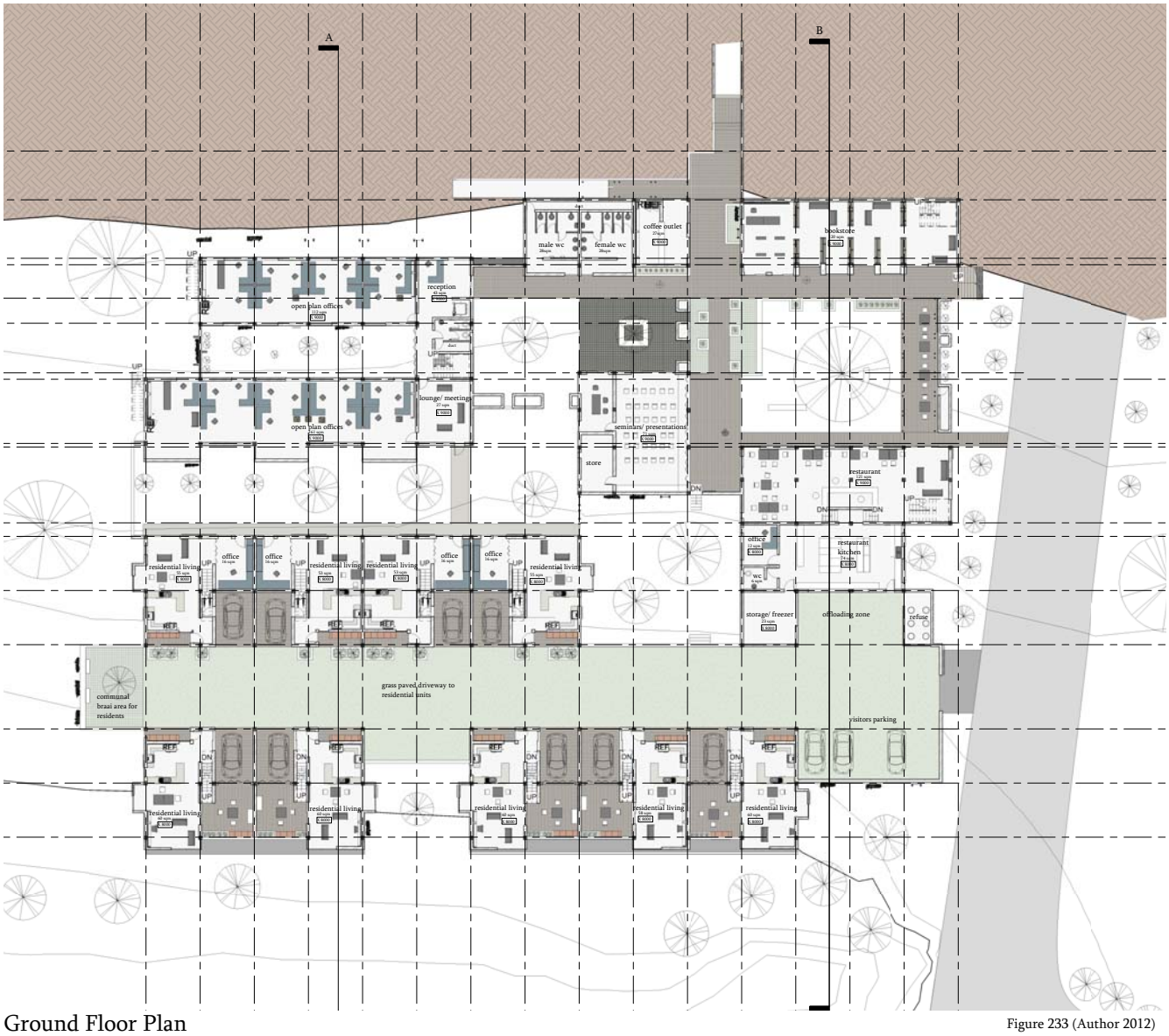


Figure 231 (Author 2012)

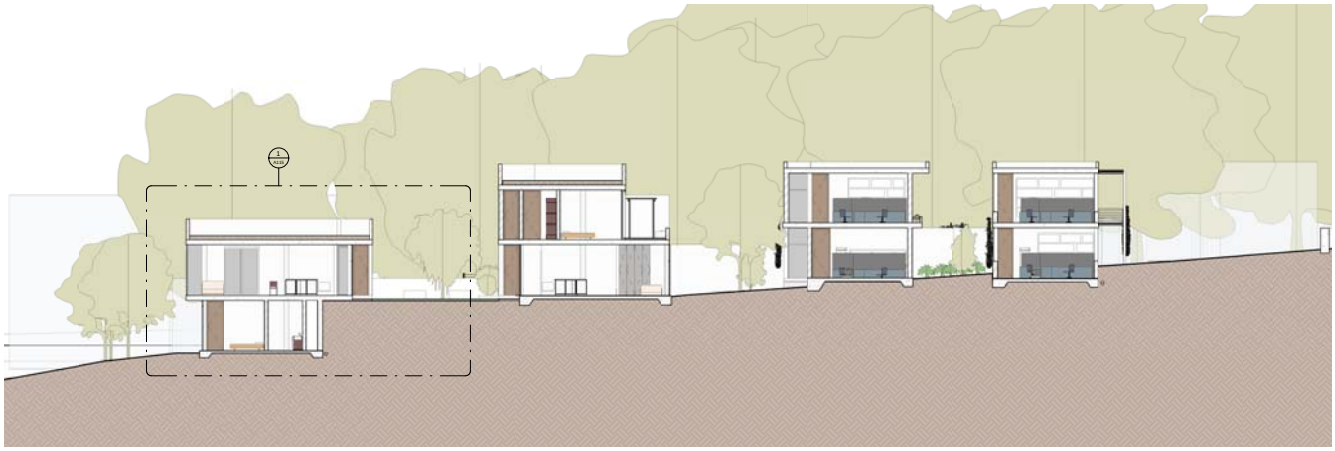
09 Drawings & Photographs

Figure 232 (Author 2012)



Ground Floor Plan

Figure 233 (Author 2012)



Section AA

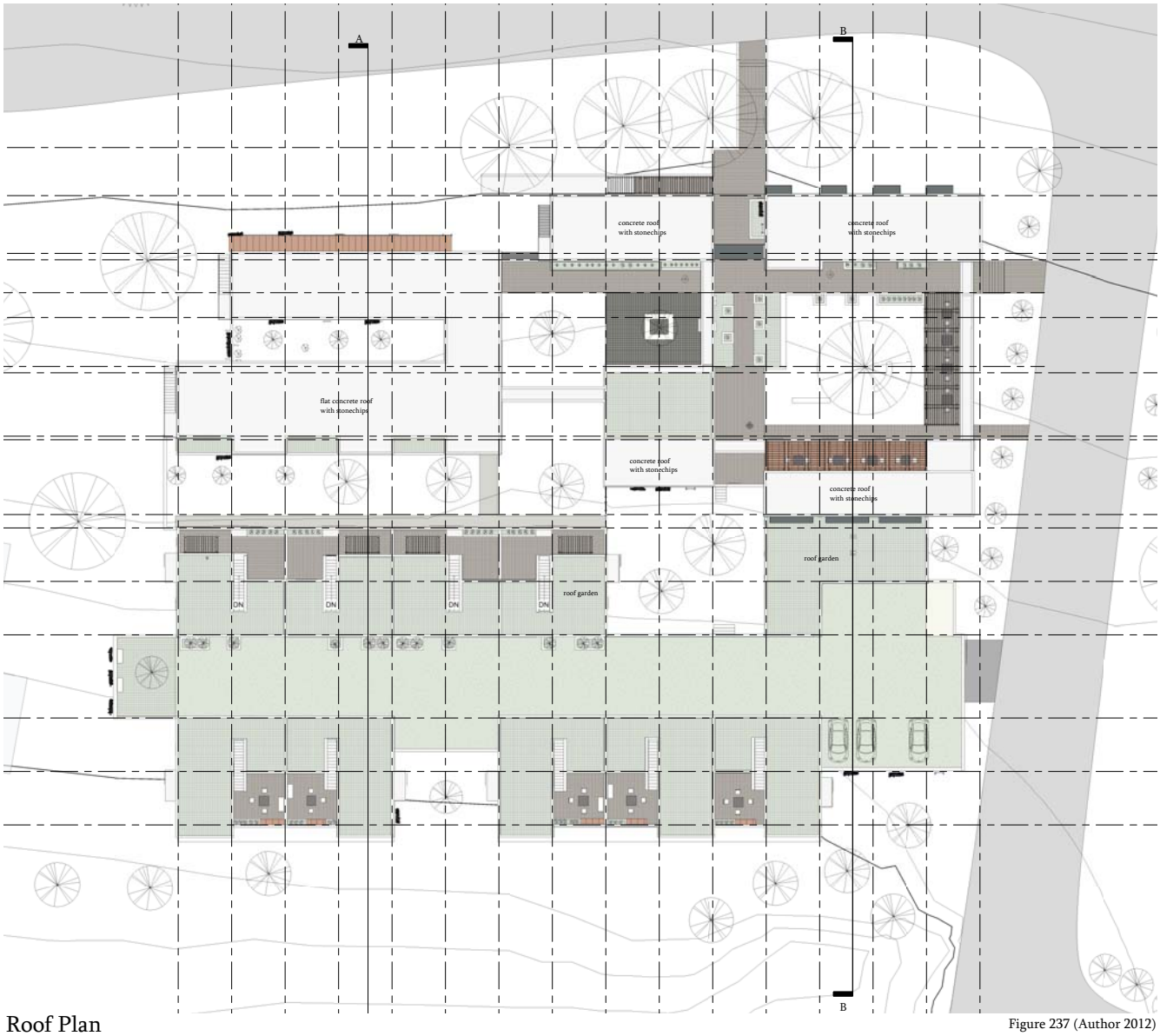
Figure 234 (Author 2012)

Upper Levels Floor Plan

Figure 235 (Author 2012)

Section BB

Figure 236 (Author 2012)



Roof Plan

Figure 237 (Author 2012)

Residential Units Lower Level

Figure 238 (Author 2012)

Figure 239 (Author 2012)

Figure 240 (Author 2012)

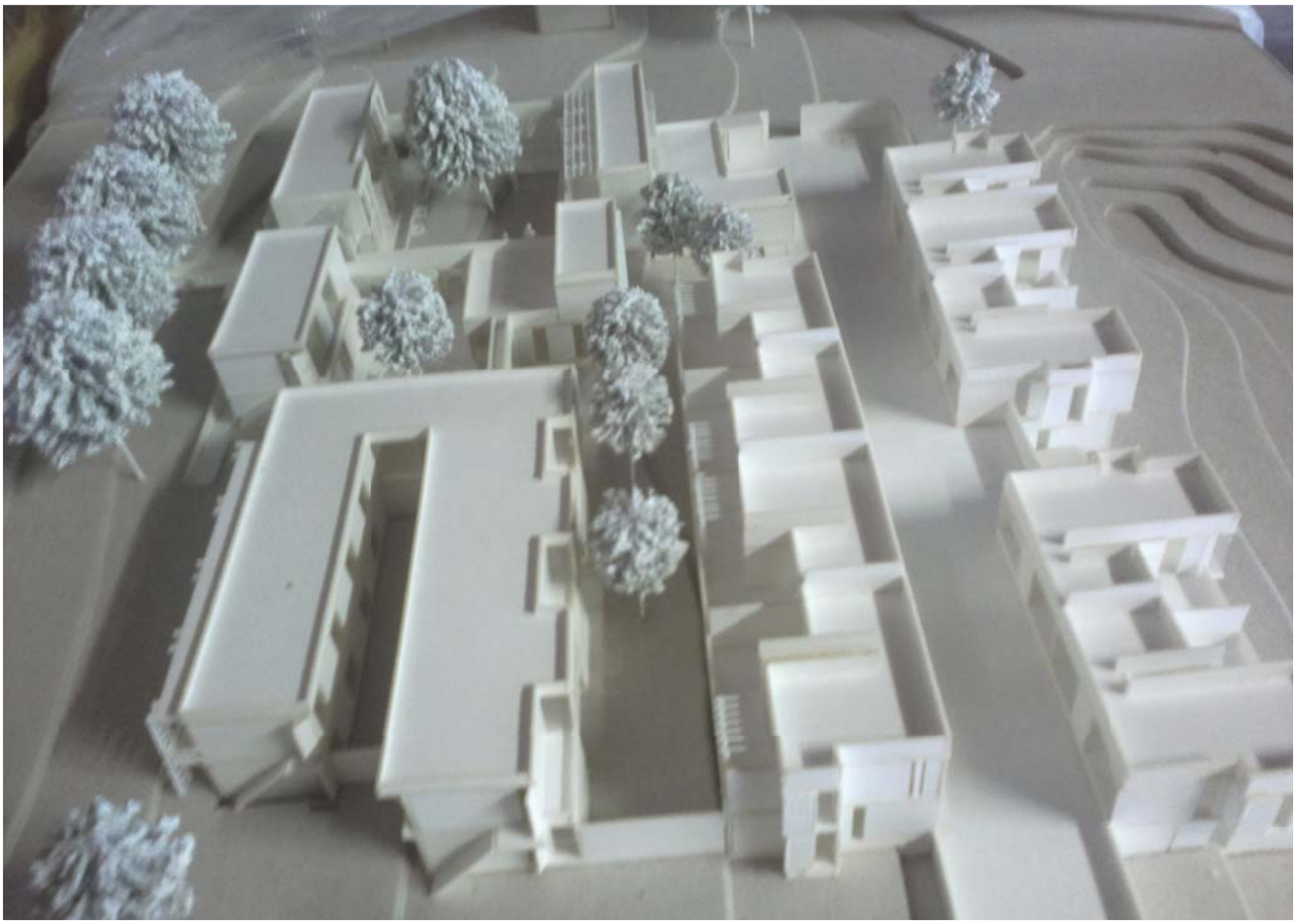


Figure 241 (Author 2012)

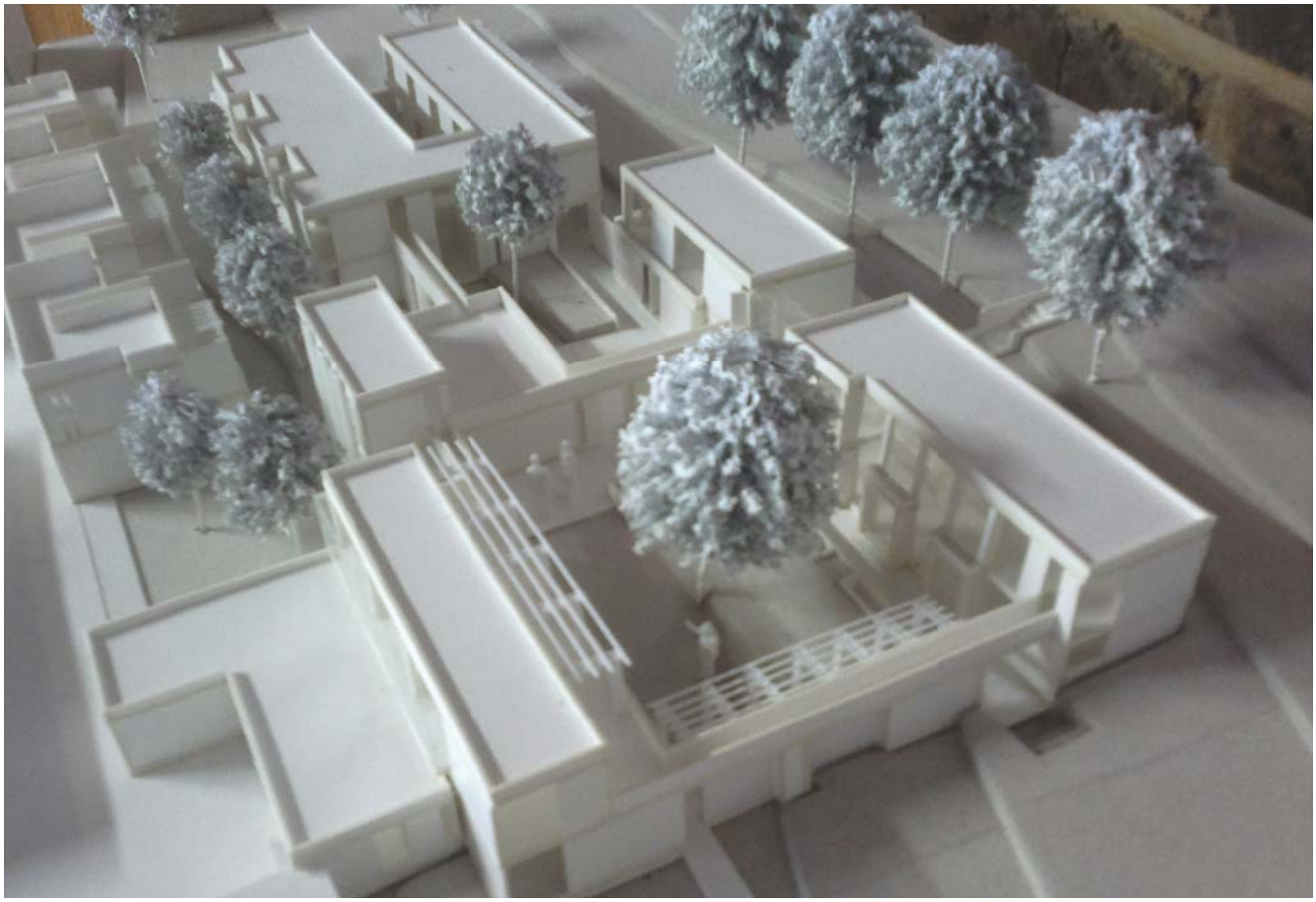


Figure 242 (Author 2012)

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