

Submitted by : Piet du Preez
Student number : 25084692
Study Supervisor : Prof. Roger Fisher

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**MOVE FORWARD,
INTO THE CITY:
MY CELEBRATION**

“Ours cannot be an architecture ashamed of itself, an architecture for the poor, an architecture without concern for the expression of cultural and aesthetic values, without profound poetical intentions”

(Forjaz 2004)





ABSTRACT

The aim of the dissertation is to create a meeting place between the rural immigrant and the city. It is a system that recognizes the various layers in which the horizontal human meets the vertical city. The meeting place must act as a transition facility where one enters the complex mechanics of city life. It is a celebration of what city life is and can be.

The function of the meeting place is to educate and orientate the user in the language and mechanics of city life. It is an archetype of the new life ahead. The catalyst of the meeting place takes the form of a market situated in between Bloed Street Taxi Station and Belle Ombre Train and Taxi Station in the north of Pretoria Central Business District.



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1. INTRODUCTION

Key words: **Interactive landscape**
Multi-layered
Meeting place
Publicness

The realm of entering the city of Pretoria is multi-layered and complex to the rural immigrant. Hard surfaces and concrete towers dominate the urban matrix. The grid dominates the built form of the city. The grid is functional and logical, conditioned to maximize movement and usage. It allows man to force a capital culture onto nature.

However, humans are more diverse and complicated than the grid. Communication, culture and interaction are non-linear activities. The built fabric in the Pretoria Central Business District (CBD) is very dense, and leaves little space for public interaction. Public spaces have been renegade to side-walks, urban parks and destination facilities such as libraries and art galleries. Side-walks are congested and do not allow for paused activities such as eating and drinking. Urban parks are scattered within the building fabric. Destination facilities are public to a quantifiable client.

Architecture must therefore become a public interface. Okwui Enwezor (2006; 9) states that public space "is not so much the institution or building designated as such, rather it is the silent obvious amenities ... public space is not a thing but a value-added quality".

Architecture must go beyond the obvious of creating public spaces and rather see the city as a public space. Buildings and built structure have a relation to human interaction. The human mind perceives the built environment and reacts with emotion. Architecture is therefore an emotional experience. The city rigid must accommodate and invite human emotions. This anomaly creates an opportunity for a meeting place between the rigid city and the flexible human mind.

This meeting place is the focus of this dissertation. The meeting place forms part of the social and interactive landscape. It extends beyond the market and street into the building itself. Horizontal movement and vertical hierarchy must be integrated within structure. It is not only the spaces in between buildings that are home to the character and activities of the city. The buildings themselves must create 'publicness', a sense of belonging and interacting.

The meeting place celebrates the urban context. It is a transition between the rural environment and the urban context.



Fig 1.1 : Hard urban surface

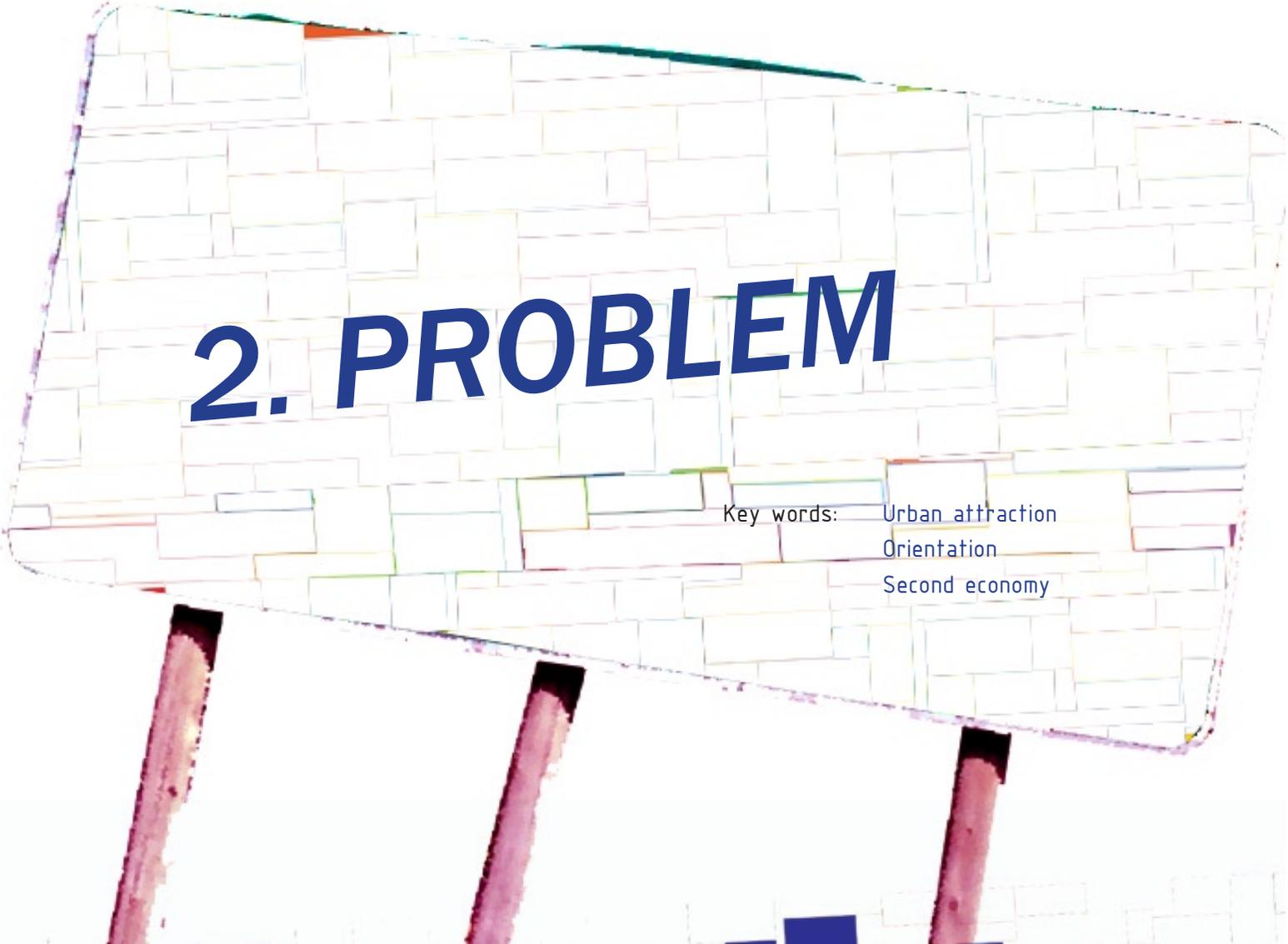


Fig 1.2 : Dispersed urban parks



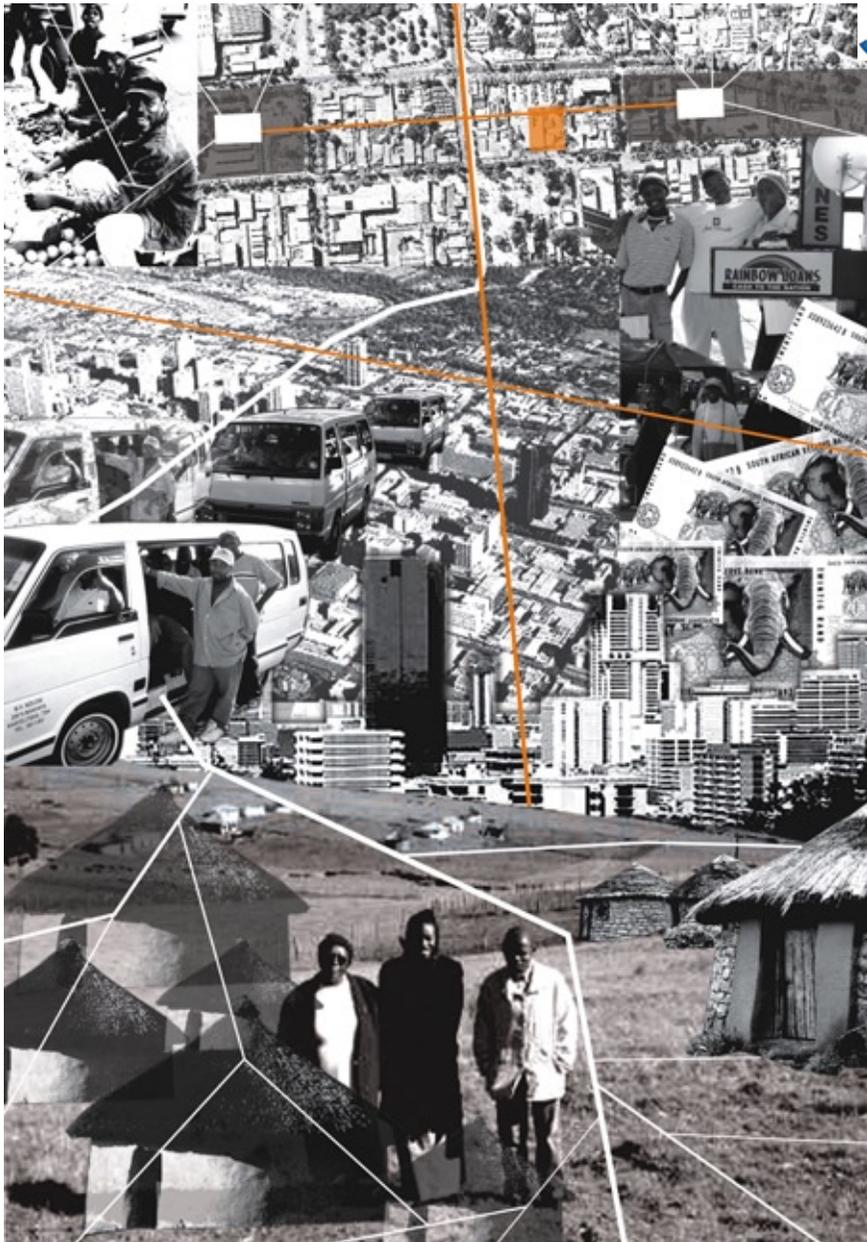
Fig 1.3 : Side-walk activities





2. PROBLEM

Key words: Urban attraction
Orientation
Second economy



The African landscape is transforming. People are moving from the rural environment into the urban environment. South Africa is no exception as the annual growth in urban population between 2000 and 2005 has been 1.6%. The 2006 urban population in South Africa was 59.3%, the projected urban population for 2030 is 71.3% (United Nations, 2006).

Fig 2.1: Journey from rural to urban



Population dynamics

The 2001 South African Census estimates the population of Tshwane at 1.986.019 people. This represents 4.43% of the total population (44.819.778 people) of South Africa in 2001. According to Statistics SA the metropolitan municipality of Tshwane experienced a net in-migration of 7.15% of the total population in 2006. Gauteng province has the highest urbanization level in South Africa at 96% (Kok and Collison 2006: 22).

Table 2.1 illustrates the urban attraction of municipal areas in South Africa in 2001 (Statistics SA). Graph 2.1 illustrates the number of people moving into the metropolitan municipality of Tshwane and the Pretoria CBD from 1999 to 2001. Fig 2.3 is a graphic representation of the urban attraction of the Pretoria CBD relative to the surrounding municipalities according to the Census 2001 data.

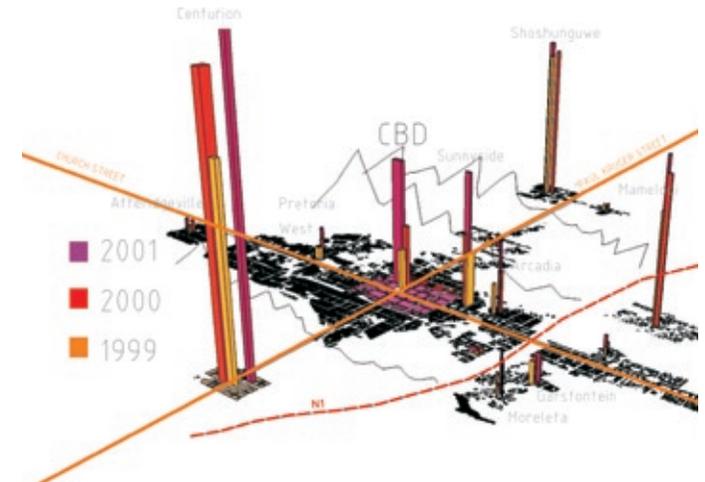


Fig 2.3: Urban attraction: Tshwane

Table 2.1: Urban attraction in 2001

Province	Municipality Name	Sub-Place	2001
Western Cape	City of Cape Town		144570
Eastern Cape	Port Elizabeth	Cape Town CBD	199
		PE Central	1798
Northern Cape	Sol Plaatje	Kimberley Central	161
			27099
Free State	Mangaung	Bloemfontein Central	1479
Kwazulu-Natal	Durban		108676
		Durban CBD	3120
North West	Rustenburg	Rustenburg Central	1056
			183130
Gauteng	City Of Johannesburg	Johannesburg CBD	1225
		City of Tshwane	108896
		Pretoria CBD	5663
Mpumalanga	Mbombela	Nelspruit Central	617
			20623
Northern	Polokwane		1253

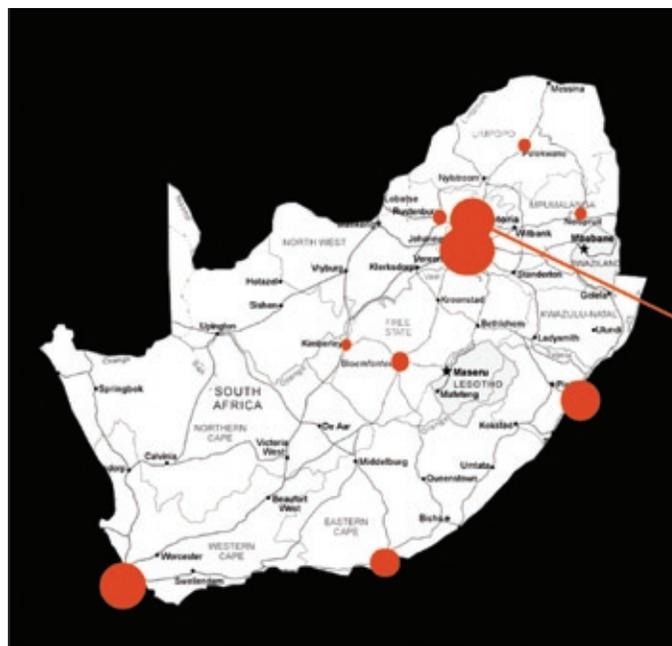
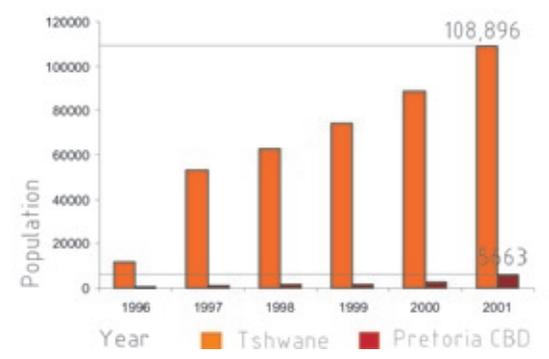


Fig 2.2: Urban attraction: South Africa



Graph 2.1: Number of people moving into district

PROBLEM

Urbanization process

A difference exists between the rural environment and the urban landscape in South Africa. In general, the rural context is situated in a natural environment. It is comparatively small and self-sustaining, tradition and culture are essential components to identity and social hierarchy within the community is very important.

In comparison, the urban landscape in South Africa is large and focused mainly on monetary exchange. The urban landscape is predominantly hard, and made of unnatural materials such as concrete, steel and asphalt. Cities are structured on a grid system with little reference to the natural environment. Tradition and culture are often exchanged for western conformity and fashion. Social hierarchy is less prevalent because of the multicultural context.

The urban landscape is illegible when one's reference point is the rural environment. It is not limited to geographical navigation. Orientation includes information on housing, health care, work, education and business skills. In order to facilitate a meaningful transition, this information needs to be grouped, structured and readily accessible.



Informality

The urbanization process in South Africa is often associated with the informal sector. The informal sector is usually associated with the illegal, extra-legal, and unregistered (Badenhorst 1988).

Participants in the informal sector are exploited because they fall outside the labour legislation and cannot access the legal system. Fear of eviction, limited access to credit, health and education undermines the quality of life. In addition, municipalities are slow to respond to the informal sector. The informal sector is often referred to as the second economy and according to Budlender, Buwembo and Shabalala (2001) this second economy contributes between seven and twelve per cent of the national Gross Domestic Product (GDP). The informal economy furthermore creates approximately 22.5 million employment opportunities in South Africa (Bivens and Gammage 2005: 9)

The informality of the second economy has serious implications for the city. Informal traders usually do not pay taxes and thus do not contribute to the maintenance of the infrastructure.



3. CLIENT

Key words: Informal sector
Mobile entrepreneur

The Metro Trading Company (MTC) is a municipally-owned entity established in 1999 to oversee the development of informal traders and micro retailers in Johannesburg. Seeing that Tshwane is the capital of South Africa, it is imperative the MTC operate not only in Johannesburg but also in Tshwane.

The Metro Trading Company understands that the urbanization process in South Africa is associated with the informal sector (Badenhorst 1988). The market therefore acts as a trading facility and a meeting point between the rural immigrant and the urban context. The MTC has set out a vision, mission and key objectives (Metro Trading 2006):

VISION

The Metro Trading Company's vision is to be a quality provider of market and transport interchanges.

MISSION

It aims to be the leading provider and manager of quality infrastructure and business support services to market traders and taxi operators.

KEY OBJECTIVES

In the quest to fulfil its vision, the MTC aims to bring about organized and well-managed trading. In meeting its responsibilities towards the management of informal trading, it aims to scale up efforts to make informal traders part of the formal economy.



Design Brief

The facility must meet the requirements of the rural immigrants, the informal traders and the Metro Trading Company. It is a public work place where rural immigrants can be aided into becoming mobile market entrepreneurs in the urban context. The catalyst of the facility is the market.

The market is a showpiece of how to negotiate the urban context. The market transcends the formal fixed market typology and consists of mobile market units. These units are designed in the workshops and constructed in the factory by the traders.

Research done by the MTC has indicated that traders prefer street stalls over markets (Thale 2002). The mobile market units are therefore the opportune method to create independent mobile entrepreneurs.

The facility is a system that transform the rural immigrant into a efficient and mobile entrepreneur.

The requirements of the facility are:

- A focal market (15,000m²)
- Extension of the market linking Bloed Street Taxi Station and Belle Ombre Train and Taxi Station with 5000mm wide pedestrian walkway
- Ground floor shops (200 m²)
- Public ablutions and shower facilities (150 m²)
- Information and recruitment centre (400 m²)
- Flexible workshops (150 m²)
- Flexible training facilities (150 m²)
- Factory (400 m²)
- Offices (400 m²)
- Parking (60 bays)



Fig 3.1: Existing mobile market unit on Bloed Street

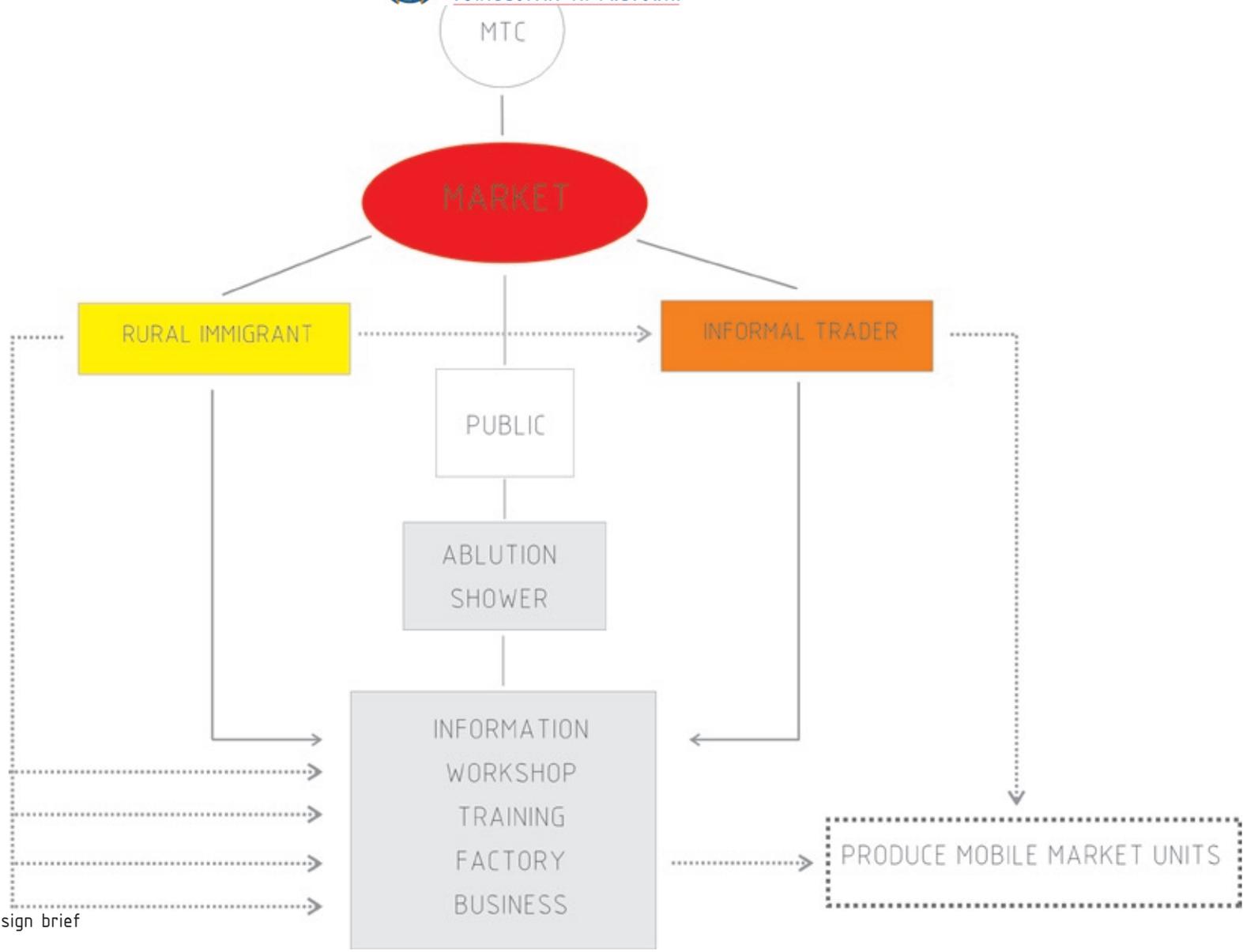


Fig 3.2: Diagram illustrating the design brief

4. PRECINCT

Key words: Informal
Transition
Potential



Fig 4.1: Precinct location



The allocated precinct is the northern periphery of the Pretoria CBD. It is bound by D.F. Malan Drive in the west, Proes Street in the south, Nelson Mandela Boulevard in the east and the Zoological Gardens in the North.

The atmosphere throughout the precinct is very active and dynamic. It is diverse, generative and presents an abundance of potential. The precinct as a whole is characterized by informal trading, micro retailers, small retailers and ad hoc entrepreneurs.

Streets are lined with stalls trading anything from food, clothes and electronics. Music plays from various shops and trader stalls and the air is filled with the smell of food and spices.

This informal flexibility creates an opportune manner for integrating the rural immigrant into the urban fabric of the city. The entire precinct acts as a transition space between the rural environment and the urban context.

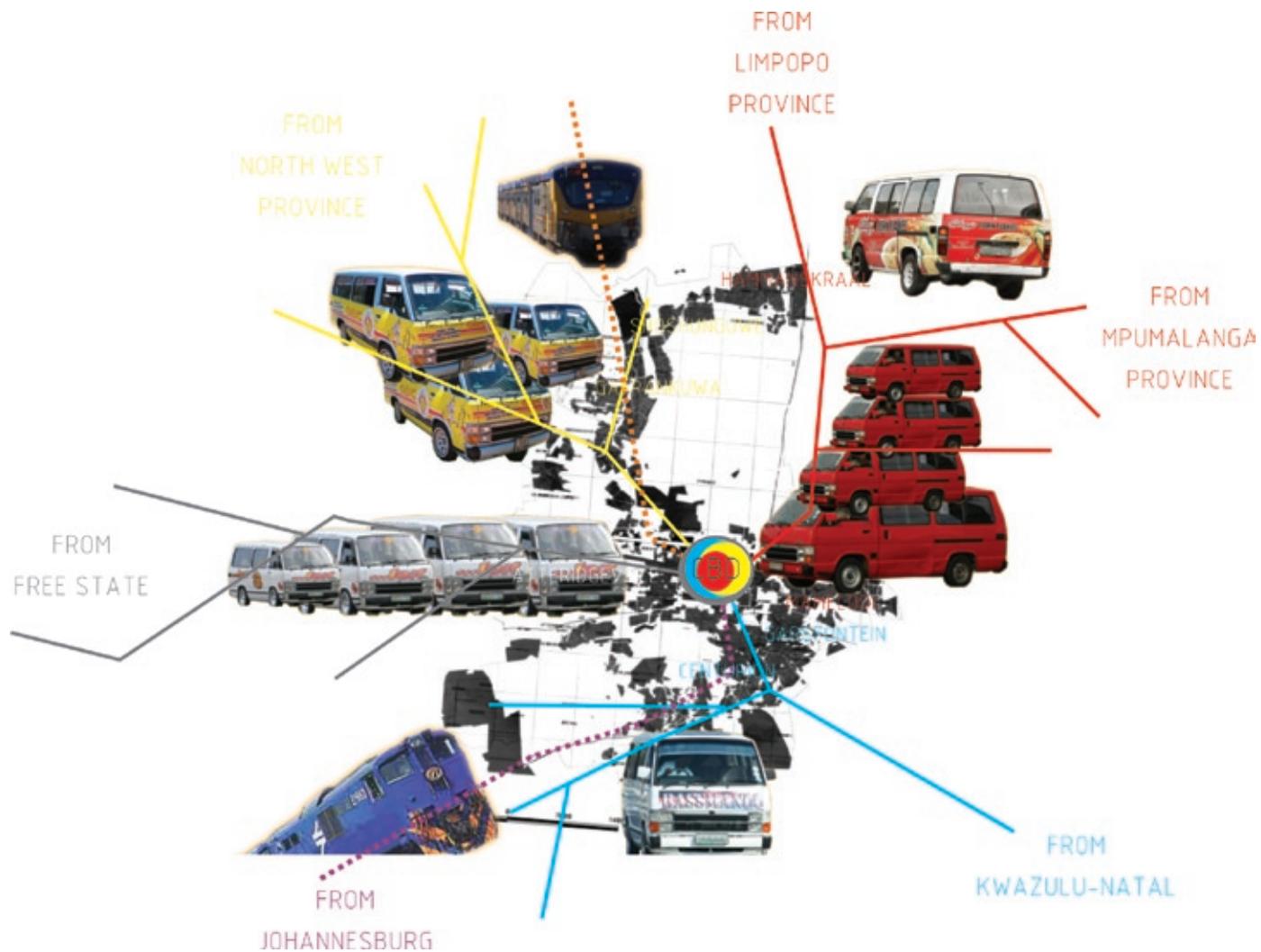


Fig 4.2: Precinct presentation



5. SITE ANALYSIS

Key words: Meeting point
Access
Movement
Activities



The predominant modes of transport from the rural environment to the Pretoria CBD are the taxi and the train.

The criteria for site selection within the precinct are that the site:

- should be located on the periphery of the Pretoria CBD
- must be in close proximity to transport interchanges
- must be on an important city axis to enhance orientation

Fig 5.1: Modes of transport for entering Pretoria CBD



Site location

It is important that the site is located on the northern periphery of the CBD near the Bloed Street and Belle Ombre transport interchanges. The northern periphery is the first meeting point between the city and the rural immigrant.

The proposed site is between Boom Street (north), Bloed Street (south), Paul Kruger Street (west) and Andries Street (east). It is between the Bloed Street Taxi Station currently under construction to the East, and the Belle Ombre Train and Taxi Station to the West.

Boom Street (north) is the northern periphery of the Pretoria CBD. It is a one-way street running from Marabastad in the west to Prinsloo Street in the east. Bloed Street (south) is a one-way street running from Prinsloo Street in the east to Marabastad in the west. Paul Kruger Street is the dominant northern entry and exit artery for the CBD. It has lanes in both directions and runs from the northern entry/exit intersection with Boom Street through Church Square to the Pretoria Train Station at the southern periphery of the CBD.

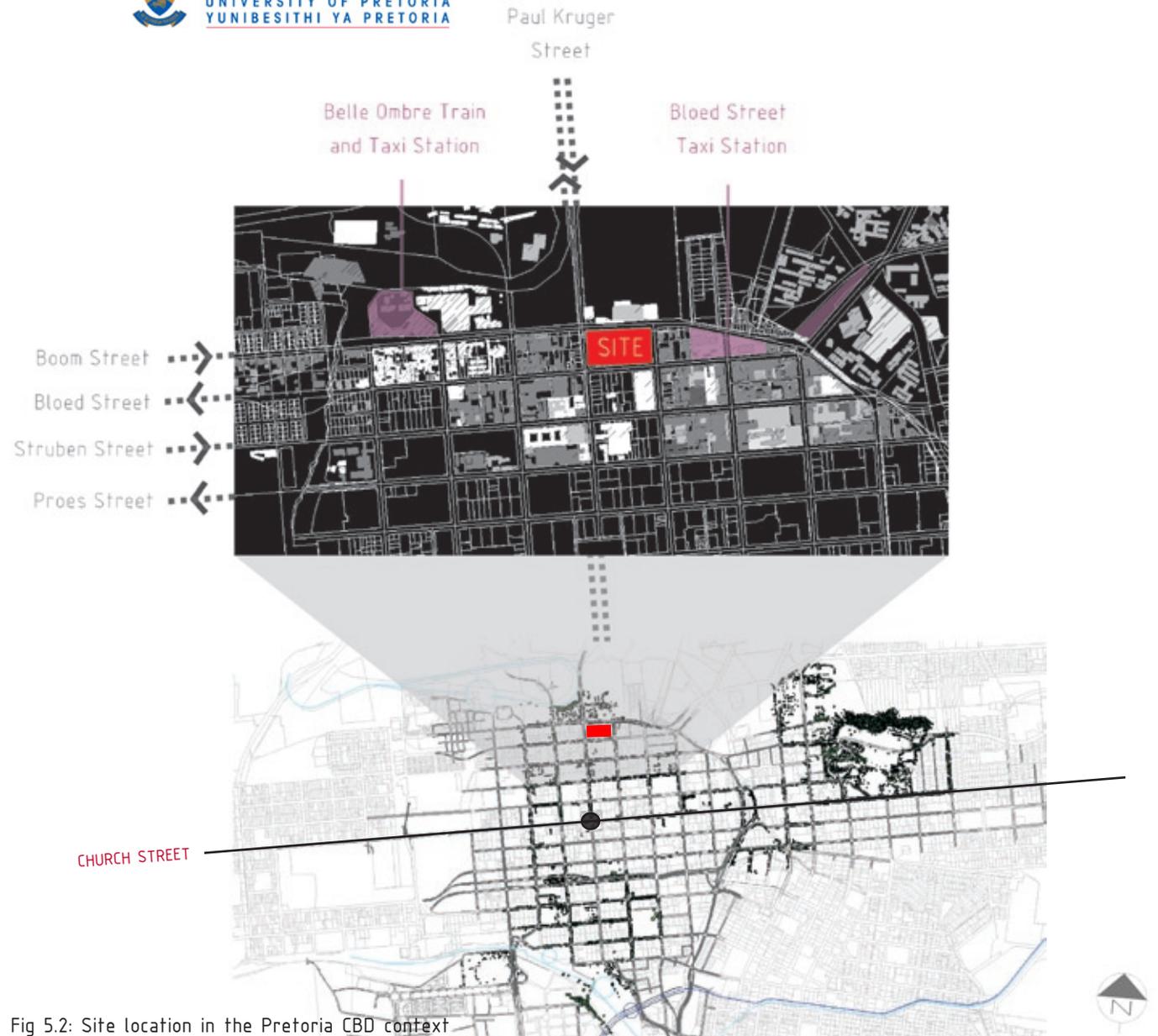


Fig 5.2: Site location in the Pretoria CBD context

Site Analysis

Site Access

The Pretoria CBD can be accessed by vehicle and by train. Vehicular access is mainly through the N4 and the N14. The N4 connects Tshwane with Nelspruit and, beyond that the Maputo harbour. Secondary access is through D.F. Malan, Paul Kruger, Voortrekker and Nelson Mandela Boulevard. Trains stop at Pretoria Station in the south and Belle Ombre Station in the North.



Fig 5.3: Transport access in Tshwane

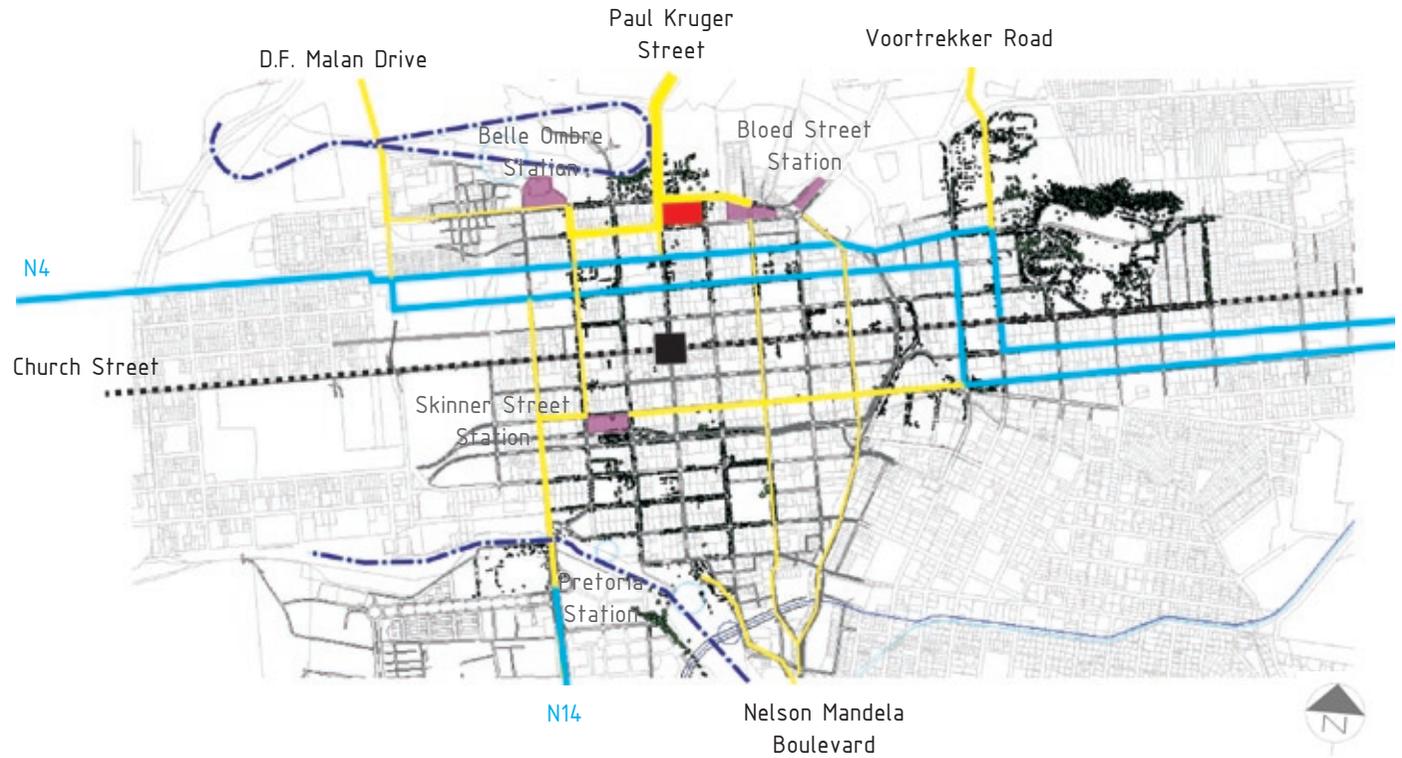


Fig 5.4: Transport access in Pretoria CBD

- Legend:
- █ Freeway
 - █ Through-routes
 - █ Railway
 - █ Taxi flow
 - █ Site
 - █ Church Square
 - █ Transport interchange



Vehicle movement

Paul Kruger Street is the northern entry/exit node to the Pretoria CBD. However, most vehicles turn off in Boom, Bloed, Struben or Proes Streets. This is because Paul Kruger Street is intercepted by Church Square presenting a vehicle slow-down zone.

The main vehicular movement is in Boom and Bloed Streets. Vehicular movement consists primarily of private vehicles and minibus taxis. There is a large discrepancy between vehicular movement in the peak and non-peak periods. Peak periods are from 6h00 to 8h30am and 16h00 to 17h30pm. Vehicular movement at night and on weekends are low.

Table 5.1 summarizes a weekday 5-minute vehicle count in Boom and Bloed Streets as measured in February 2007. Peak measurements were taken at 7h00am and off-peak measurements at 10h30am.

Table 5.1: Traffic volume per 5-minute interval

Street		Taxi	Bus	Private
Boom	Peak	95	8	103
	Off-peak	46	2	38
Bloed	Peak	76	4	72
	Off-peak	41	1	42

Site Analysis

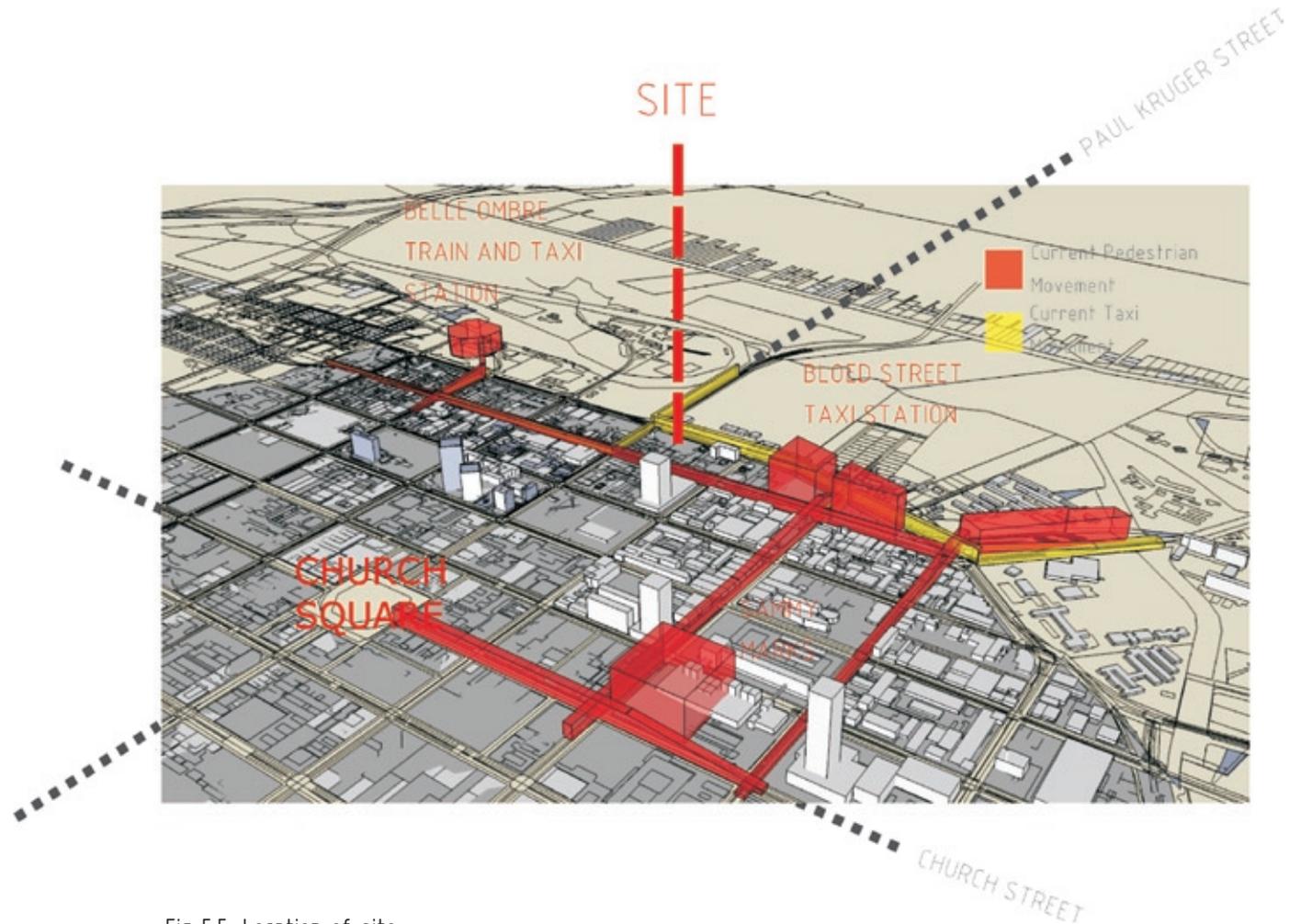


Fig 5.5: Location of site

Pedestrian movement

The fortification of erven is the primary reason for the perimeter pedestrian movement in the precinct and the selected site. Pedestrian movement is predominantly on the side-walks. The pace of the pedestrian movement is fast, as people move from one place to the next. There is very little infrastructure where it is possible to pause and sit.

In the week, there is a rush of pedestrian movement in the mornings and late afternoons as commuters hurry to and from the taxi stations. It reaches its peak from 11h30am to 14h00pm. Streets are quiet at night due to the limited activities in the precinct. Saturday mornings are busy but the street are desolate on Sundays.

Bloed Street is the primary east-west artery that connects Bloed Street Taxi Station and Belle Ombre Train and Taxi Station. Van der Walt Street is the primary north-south artery that connects Bloed Street Taxi Station and Sammy Marks Square. Pedestrian movement on Andries Street is restricted due to the renovation of the Department of Home Affairs and the construction of the National Research Library. The pedestrian movement on Paul Kruger Street is secondary to that of Bloed and van der Walt Streets due to the limited activities on Paul Kruger Street north of Struben Street.

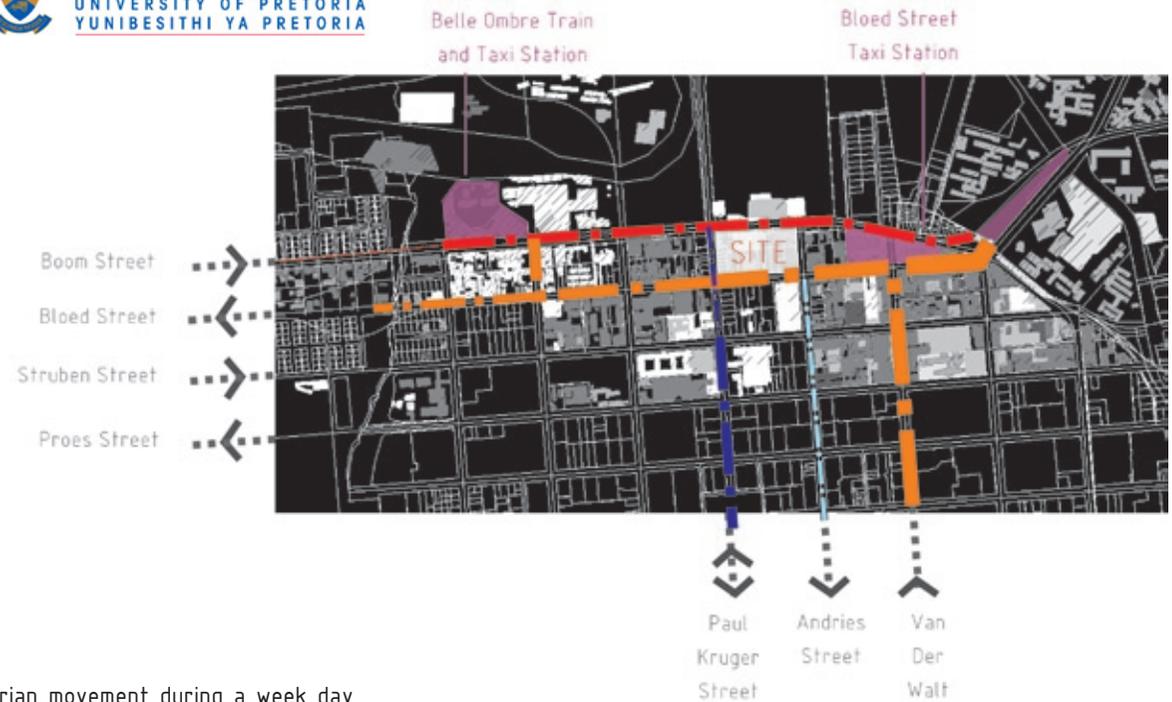
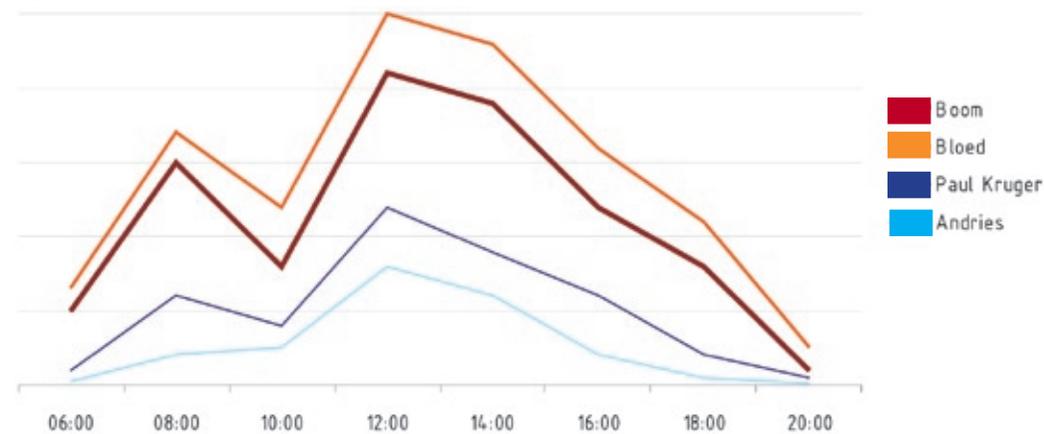


Fig 5.6: Pedestrian movement during a week day



Graph 5.2: Pedestrian movement during a week day





Fig 5.7: Photograph collage of streetscape

Site Analysis



Fig 5.8: Photograph collage of streetscape



Activities

The pedestrian activity on the side-walks generate a multitude of new opportunities. Jan Gehl, an urban designer from Denmark remarks that it is generally true that new activities are generated in the vicinity of existing activities (Gehl 1987: 25-27). This is particularly evident in Bloed and Van der Walt Streets as these streets are congested with informal traders and pedestrians.

Informal traders sell various goods, ranging from hair products, electronics to food and drinks. Informal trader stalls are mainly composed of steel tables and canvas tent structures which are stored in the surrounding shops (Bloed Street 2007: Interview). Informal traders are situated either adjacent to the shop windows or to the street. The latter option creates an improved symbiotic relationship between the traders and the formal shops.

Shops range from small enterprises selling furniture, electronics and food to large corporate shops such as Timbercity. There are disagreements between informal traders and shopkeepers as stalls obstruct the on-street advertisements of the shops. In addition, the informal traders pollute the walkway and obstruct pedestrian movement.

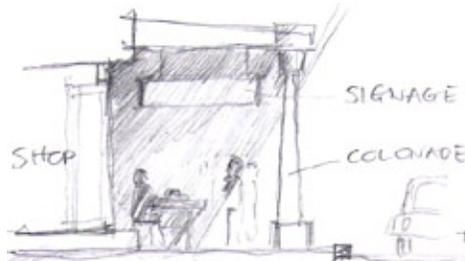
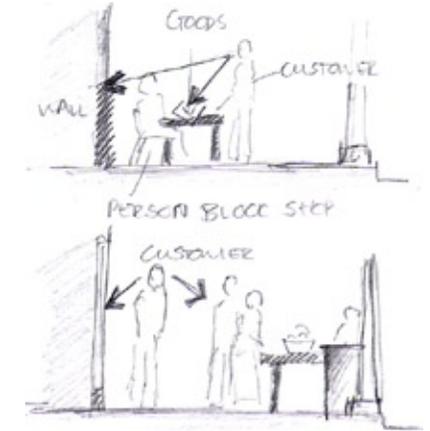
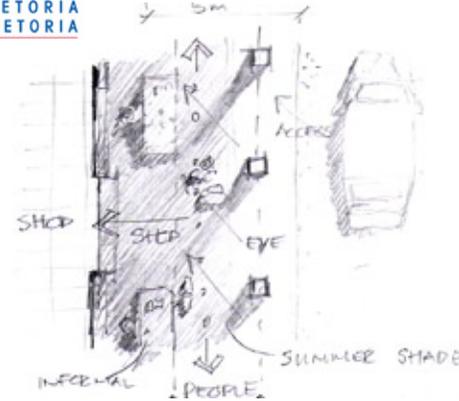
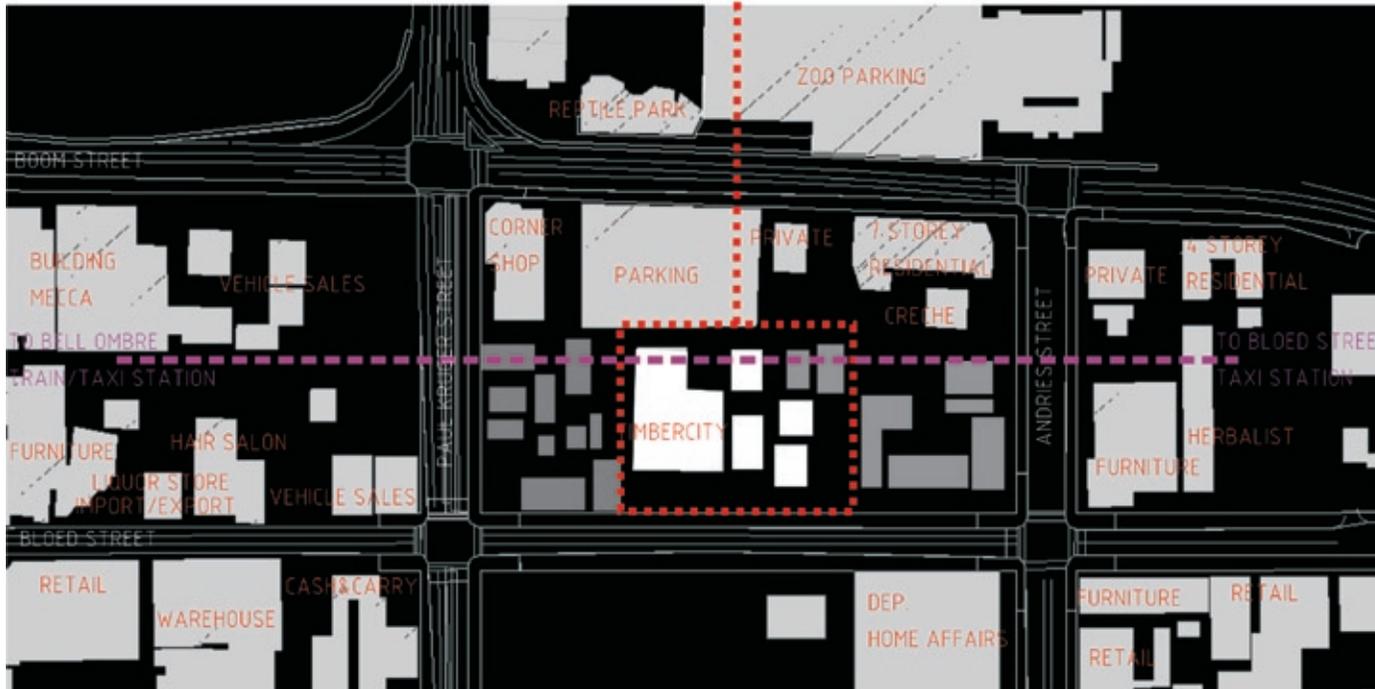


Fig 5.9: Photograph collage of activities in 1km radius

Site Analysis



SITE



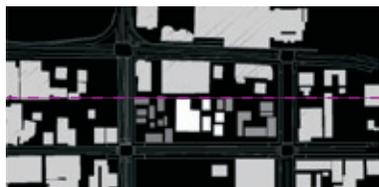
The entire city block bounded by Paul Kruger, Boom, Andries and Bloed Streets is in the process of being demolished. In February 2007 selected buildings were cleared and demolition commenced.

By September 2007 these buildings were demolished. Several of the remaining buildings are still occupied by commercial and private tenants. In addition, there are several buildings of heritage value (to be discussed later).

The demolished section of the city block is occupied by the temporary relocation of the Bloed Street Taxi Station (BSTS). This will continue until the completion of the Bloed Street Taxi Station currently under construction adjacent to Van Der Walt Street.

Fig 5.10: Formal activities

Demolition commences on site



Operational
BSTS

Taxi station relocates to site



Construction
BSTS

Open site for future development



Operational
BSTS

Fig 5.11: Site February 2007

Fig 5.12: Site September 2007

Fig 5.13: Future





Architecture

As for the entire precinct, the main building principle is economies of scale. The economic use of brick, concrete and steel is evident throughout. Most of the structures are derelict but in use. There are a few renovated buildings but with little architectural value.



Fig 5.14: Photographs of buildings within 500m radius of site

Advertising boards and screens dominate the built structures. Buildings without advertising screens are brightly painted to advertise the businesses or services within them. Several businesses spill out onto the side-walk during the day.



Fig 5.15: Advertising screens dominate built structure

Safety is a primary concern as most buildings have strenuous safety precautions, such as barbed wire, steel bars and electrical fencing. Access to buildings are restricted through fenced entrances or security gates. Most of the erven have precast concrete or steel palisade fences.



Fig 5.16: Safety precautions

Site Analysis





Heritage

Buildings with heritage value are neglected. Some are still in use as offices or day-care centres. The heritage structures are mostly single storey units constructed of masonry, mortar, concrete, timber and steel. The heritage buildings give a historical dimension to the urban fabric of the northern periphery.



Fig 5.17: Aerial photograph of heritage buildings

Figure list:

- 1 Single storey late Edwardian
- 2 Single storey late Victorian
- 3 Corner cafe from Bazaar era
- 4 Single storey Victorian/Edwardian era
- 5 Single storey Victorian/Edwardian era
- 6 Two storey with sandstone engraving
- 7 Single storey Edwardian era
- 8 Single storey Edwardian era



1



2



3



4



5



6



7



8

Fig 5.18: Elevation photographs of heritage buildings



Scale

The city scales down to the northern periphery of the Pretoria CBD. The general building height in the precinct is between one and three storeys. Photographs taken from the roof of Park College, on the corner of Struben and Paul Kruger Street illustrates that trees conceal the general built structures.

However, the Department of Home Affairs, on the corner of Bloed and Andries Street is a 37-storey glass tower. Due to the vast difference in scale between this building and the rest of the precinct, it acts as an orientation beacon and it is immediately identifiable.

The general building height on the allocated site is one storey. The only structure framing the site is the seven-storey residential apartment complex on the corner of Boom and Andries Streets. The apartment complex dominates the scale of the site.

Side-walks are generous at an average width of 5000mm. The fact that the built structure is predominantly lower than 2 storeys adds value to the spatial experience of the street. Side-walks are cast in shadow by the London Plane trees in Boom Street and the Jacaranda trees in Paul Kruger, Andries and Bloed Streets.

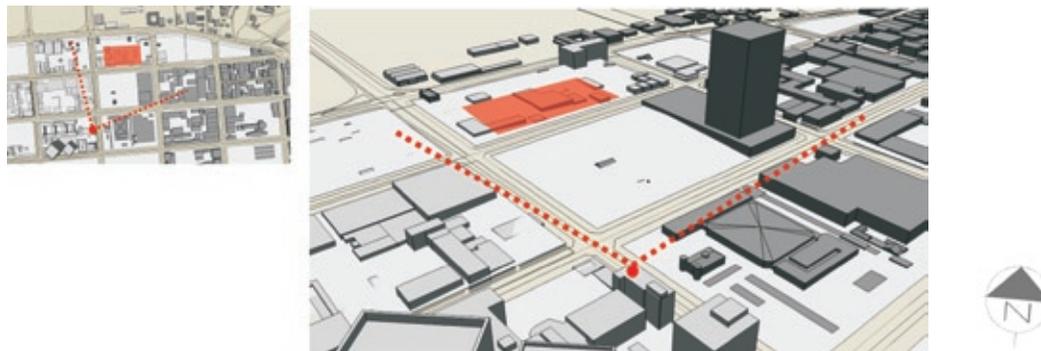
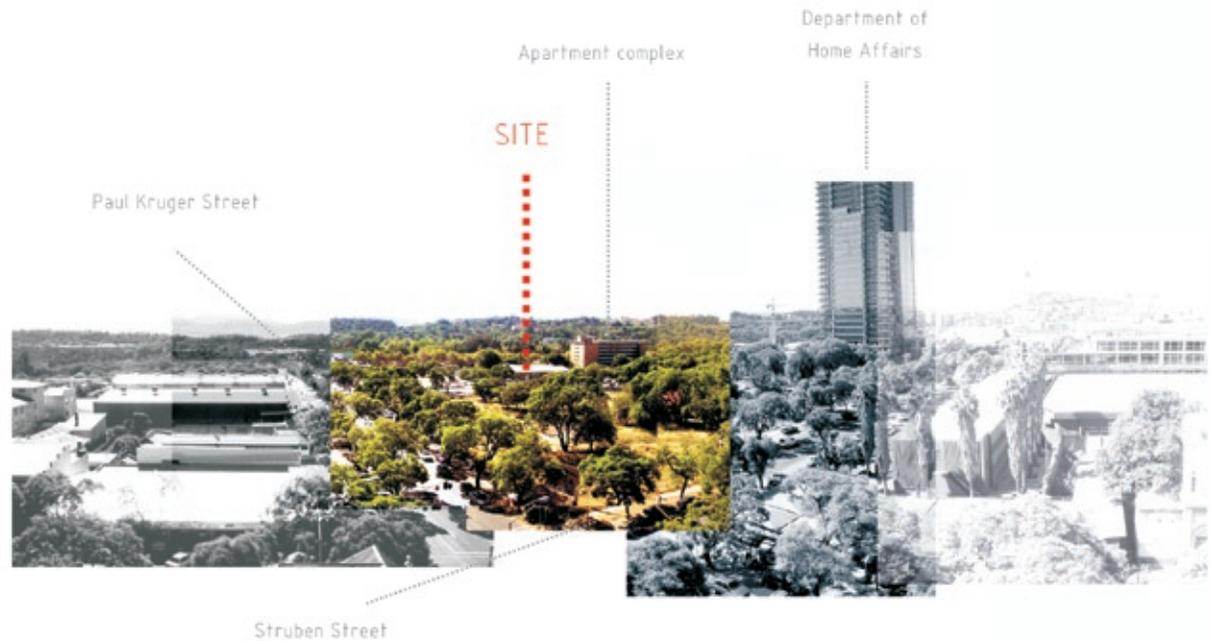


Fig 5.19: Photograph of site from Park College roof

Site Analysis



Table 5.2: S on Pretoria

Month	Temperature (° C)				Precipitation		
	Highest Recorded	Average Daily Maximum	Average Daily Minimum	Lowest Recorded	Average Monthly (mm)	Average Number of days with >= 1mm	Highest 24 Hour Rainfall (mm)
January	36	29	18	8	136	14	160
February	36	28	17	11	75	11	95
March	35	27	16	6	82	10	84
April	33	24	12	3	51	7	72
May	29	22	8	-1	13	3	40
June	25	19	5	-6	7	1	32
July	26	20	5	-4	3	1	18
August	31	22	8	-1	6	2	15
September	34	26	12	2	22	3	43
October	36	27	14	4	71	9	108
November	36	27	16	7	98	12	67
December	35	28	17	7	110	15	50
Year	36	25	12	-6	674	87	160

Climate

The Pretoria CBD has warm summer temperatures and relatively cold winter temperatures. Pretoria falls in the summer rainfall region, and is prone to late-afternoon thunderstorms and hail. Winds are calm in the CBD. The predominant wind direction is north-east in the morning and north-west in the afternoon.

The summer sun angle is 88° in altitude and the winter sun angle is 44° in altitude. (Schulze, 1986) Table 5.3 shows the sun angles at various times of the year, given that Pretoria is at a latitude of 26°.

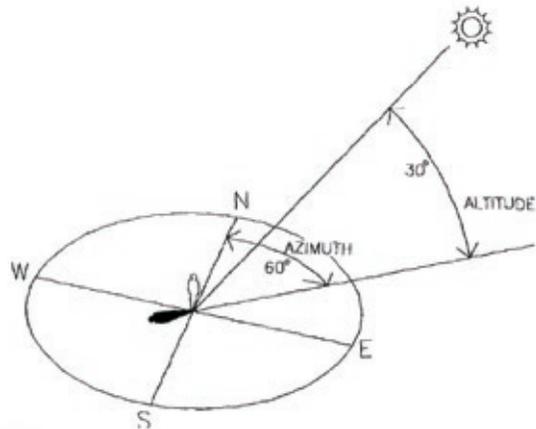


Fig 5.20: Diagram of sun angle

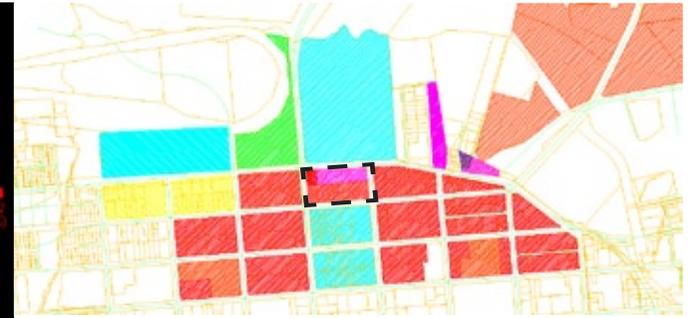
Table 5.3: Sun angles for Pretoria CBD

Solar Times	06h00	08h00	10h00	12h00	14h00	16h00	18h00
Clock Times	06h18	08h18	10h18	12h18	14h18	16h18	18h18
Azimuth - 21 Desember	112 east	101 east	91 east	0	91 west	101 west	112 west
Altitude - 21 Desember	10	35	63	88	63	35	10
Azimuth - 21 March/September	90 east	76 east	53 east	0	53 west	76 west	90 west
Altitude - 21 March/September	0	26	51	65	51	26	0
Azimuth - 21 June	N/A	55 east	34 east	0	34 west	55 west	N/A
Altitude - 21 June	N/A	14	32	40	32	14	N/A



Legal

The city block is zoned for residential in the north and for general business in the centre and south of the block. The site is zoned as General Business. Legal coverage is 60% (zone 4), maximum height is 19m (zone 5), floor space ratio is 2.5 (zone 4) and the minimum sidewalk is 3.5m from the building line.



- Legend
- Residential
 - Commercial
 - Government
 - Industrial



Fig 5.21: General zoning in the precinct

Physical

The average height of the site is 1306m above sea level. The site slope down to the north at an average angle of 1.75°. The south perimeter, Bloed Street, is elevated approximately 3800mm above the northern perimeter, Boom Street.

Boom Street is lined with London Plane trees and Paul, Kruger, Andries and Bloed Streets are lined with Jacaranda trees.

The site is predominantly covered with asphalt, concrete and paving. Very little natural vegetation exists on the site.

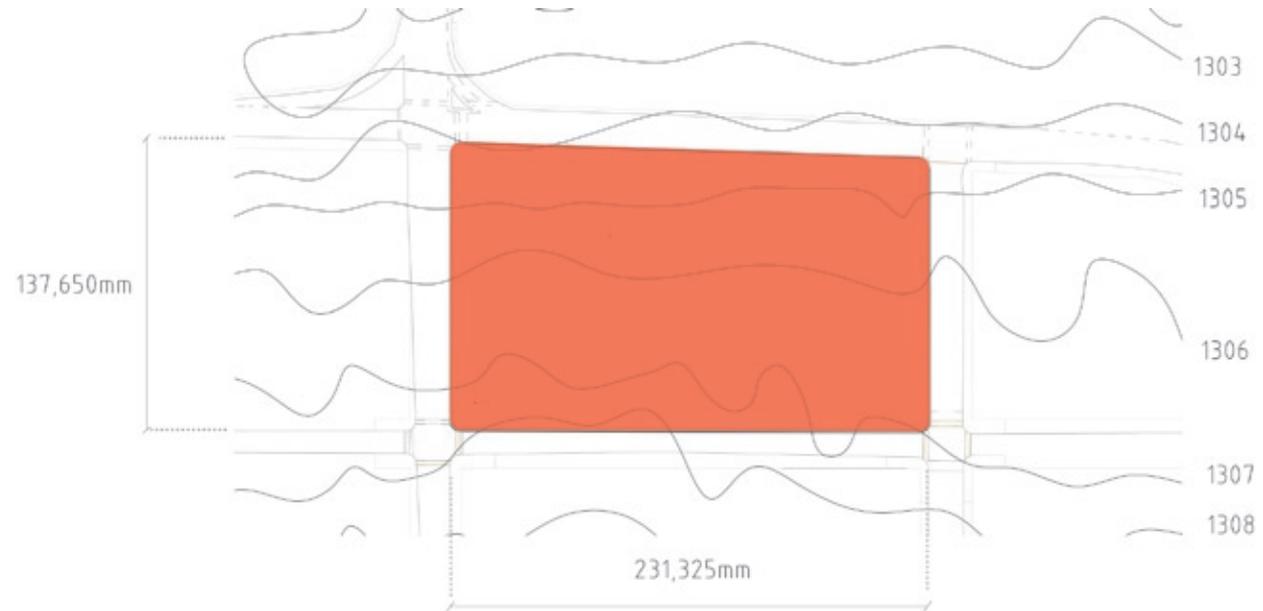


Fig 5.22: Physical properties of site

Site Analysis



SWOT analysis

Strengths:

- Visible site on entry into the Pretoria CBD from north in Paul Kruger Street
- Link with city centre down Paul Kruger Street
- Adjacent to Bloed Street Taxi Station to the east
- Proximate to Belle Ombre Train and Taxi Station to the west
- Adjacent to Department of Home Affairs
- Adjacent to Zoological Gardens
- On-site 7-storey residential apartment complex
- Existing London Plane and Jacaranda trees on site perimeter
- Brown built site

Weaknesses:

- Few night activities
- Limited residential units
- Limited buying power in precinct
- Derelict infrastructure in terms of roads and services

Opportunities:

- Creating internal pedestrian link between Bloed Street and Belle Ombre transport interchanges
- Vacant land for market area
- Vacant land for urban park area
- Increasing street activity
- Integrating with Zoological Gardens
- Establishing 24hr-activities

Threats:

- Safety and security in large open space
- Management of pollution



Fig 5.23: Opportunity for pedestrian link between transport interchanges



6. DESIGN APPROACH

Key words: Memories
Interaction
Relationship
Transition

It is a system that offers various modes of transition between the rural environment and the urban context dependant on time and the level of interaction.

Design Discourse

Catherine Coquery-Vidrovitch (1995: 50) defines urbanization as “first of all, a process that has to do with space ... However, it is also a social process that generates contradictions ... It is not only a pole of attraction, but also a pole for spreading ideas, it is therefore, a place for blending memories.”

In his book *Thirdspace-Journeys to Los Angeles and Other Real-and-Imagined Places* Edward Soja (1999) draws on the work of Lefebvre to establish a place for blending memories. The argument is that architecture should move beyond the first space (perceived space) and the second space (representation of space) into the realm of the third space (the lived space). This argument supports the idea that architecture creates memories, a place where contact is established and where interaction takes place.

The dominant forces driving the design are therefore the requirements of the user. Operational logic dominates over compositional design in order to anticipate and negotiate the user. Architecture must not consume the potential of the site, but rather stage the ground for promise and uncertainty (Corner 2006: 31).

The publicness of the meeting point between the rural immigrant and the urban context is reliant on the potential to generate contact, interaction and memories. The design is therefore more than structure, but is an effect on the human mind. It is an emotional interaction between structure, programme, user and environment. Time is favoured over space, effect over meaning and performance over appearance (Czerniak 2006: 121).

The facility is focussed on the different layers in which the rural immigrant and the urban context meet. Some of the meetings are quick and effortless. They demands basic interaction and services. However, certain interactions can grow and develop into a relationship between the user and the facility.

This is the expression of the facility, the generation of a symbiotic relationship as a function of the demand generated by the interaction. The interaction levels differentiate as the facility differentiates, thus giving potential to new and improved ways of understanding the language and mechanics of the urban environment. It is a system that offers various modes of transition between the rural environment and the urban context dependant on time and the level of interaction.



Design Principles

Interaction is layered

A vertical vector hierarchy is established driven by the negotiation of the user with the structure as a function of time. The idea is to incorporate the horizontal movement of humans with the vertical hierarchy of the city.



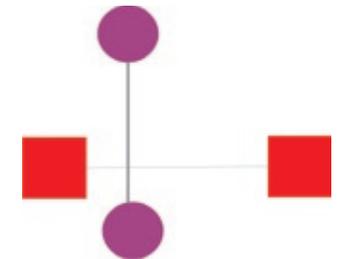
Extending beyond erf boundaries

It is essential to investigate beyond the erf boundaries. This facility is en-route between two major transport interchanges (Bloed Street and Bell Ombre Taxi Stations) and it acts as a connecting device between them.



Orientation through activity

The most effective means of orientation is activity. Exposing, or even celebrating activities that are conventionally hidden from the viewer.



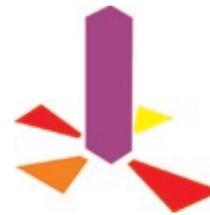
Extending the street

The building must be an extension of the street. The horizontal movement of humans should be vertically aligned with the hierarchy of the building. Floors should become extrapolations of the street.



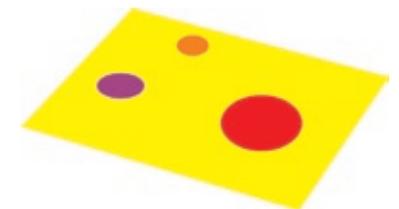
Creating a centre point

A visual and metaphysical centre point is needed to anchor the activities. This would be a focus point from which other activities radiate. This centre point would be a beacon that acts as an orientation device.



Allocating a third landscape

Third Landscape is a term coined by French landscape designer Gilles Clement, and refers to "spaces receptive to diversity" (2006: 90). It is important to allocate space that people can inhabit and make their own.



DESIGN APPROACH



Programme

The programme follows the predominant design principle that the site is layered as a function of time. The time function is the level of interaction between the rural immigrant and the facility.

The ground level is the quick access forum, facilitating a market. A market is an ideal meeting place between the rural immigrant and the urban context. Trading is one of the oldest ways to move from one place to the next. The primary idea is to sell foreign goods to local clients.

The amenities of the market include basic services needed for traders and rural immigrants arriving in the city. They comprise of public washing facilities, training facilities, workshops and a factory and are located on the upper levels. The top level is the slow access forum, facilitating a business school, library and computer room.

Each level is a culmination of the previous level representing a prolonged interaction between the user and the facility.

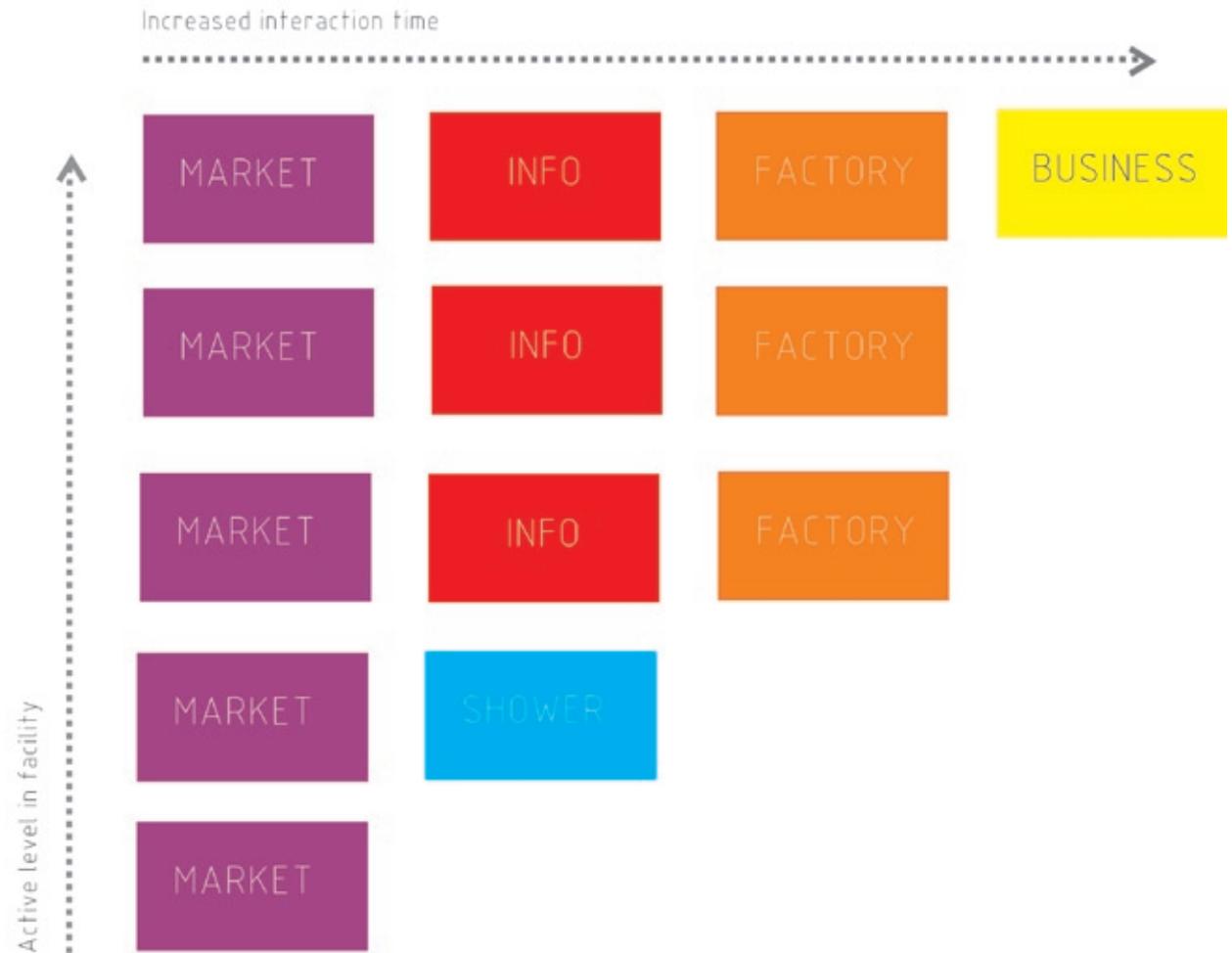


Fig. 6.1: Programme of facility with reference to time



Pretoria CBD Design

The dispersed urban parks in Pretoria CBD are strengthened with the addition of strategically placed urban parks and pedestrian streets.

Two additional urban parks are proposed for the Pretoria CBD. The northern gateway of the CBD at the intersection of Paul Kruger and Boom Streets is converted into a urban park. Paul Kruger House and Church is connected with an urban park on the intersection of Potgieter and Pretorius Streets.

Paul Kruger Street is pedestrianised from Minnaar to Bloed Street. This links Pretorius Square with the proposed northern urban square. The pedestrianisation of Church Street is extended west from Church Square up to Potgieter Street. This links Sammy Marks with Church Square and the proposed western urban park.

Existing urban space:

- 1 Church Square
- 2 Sammy Marks
- 3 Pretorius Square

Proposed urban space:

- 4 West Square
- 5 North Square

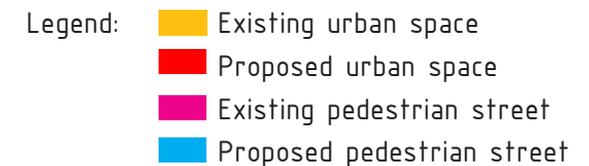
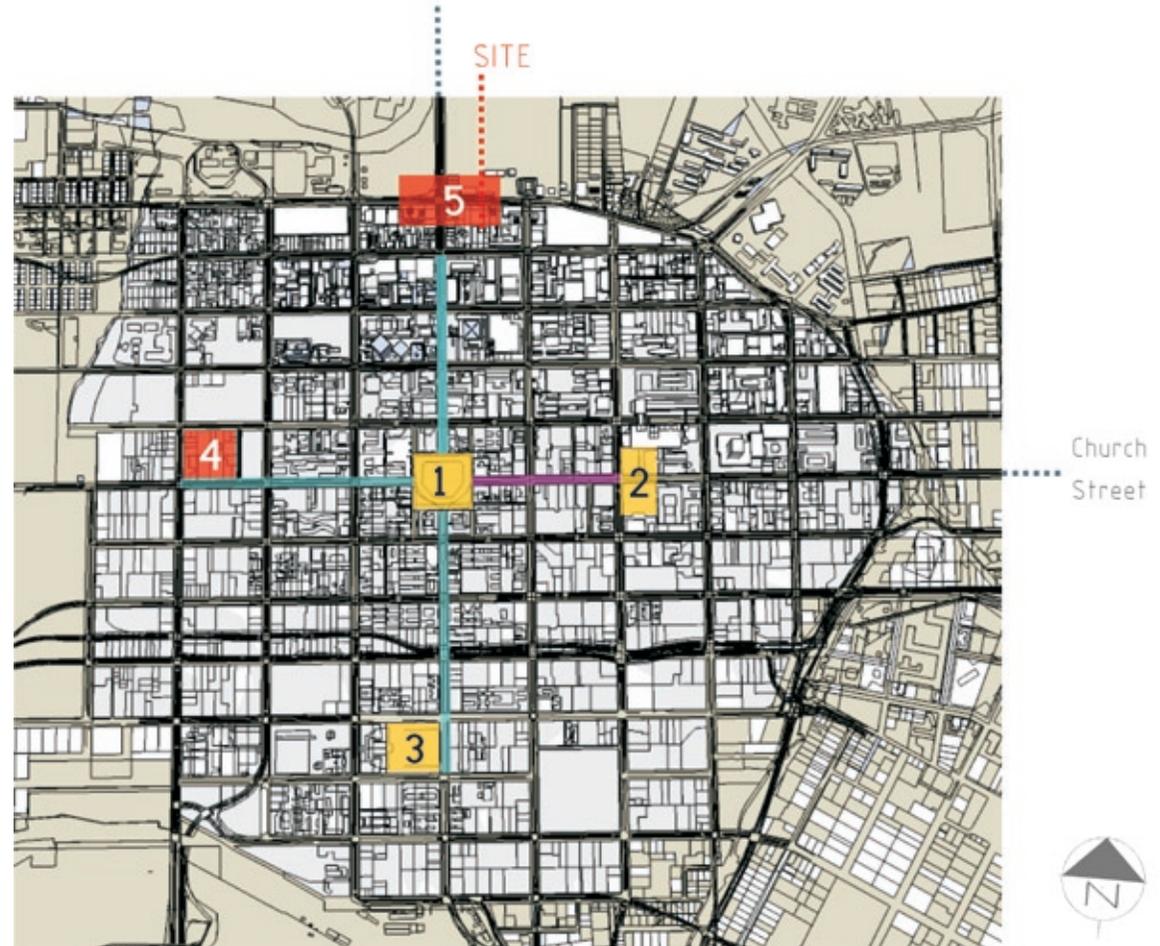


Fig: 6.2: Urban space network in Pretoria CBD

DESIGN APPROACH

Site Design

The site forms part of the northern urban square. Existing tarmac is replaced by concrete and brick pavers in order to include Paul Kruger, Boom and Bloed Streets into the urban square. Paul Kruger Street is pedestrianised up to Bloed Street increasing the pedestrian flow to the northern square.

The permeability of the site is increased with the addition of a north-south and east-west pedestrian walkway. Open corners and mid-street entrances increase the permeability of the site.

Mid-block pedestrian walkways intercept city blocks to form a secondary pedestrian flow to the street walkways. The east-west pedestrian walkway connects the Bloed Street Taxi Station with the proposed Metro Mall and Belle Ombre Train and Taxi Station.

Existing transport interchanges:

- 1 Belle Ombre Train Station
- 2 Belle Ombre Taxi Station
- 4 Bloed Street Taxi Station

Proposed transport interchange:

- 3 Metro Mall



Fig. 6.3: Proposed site design

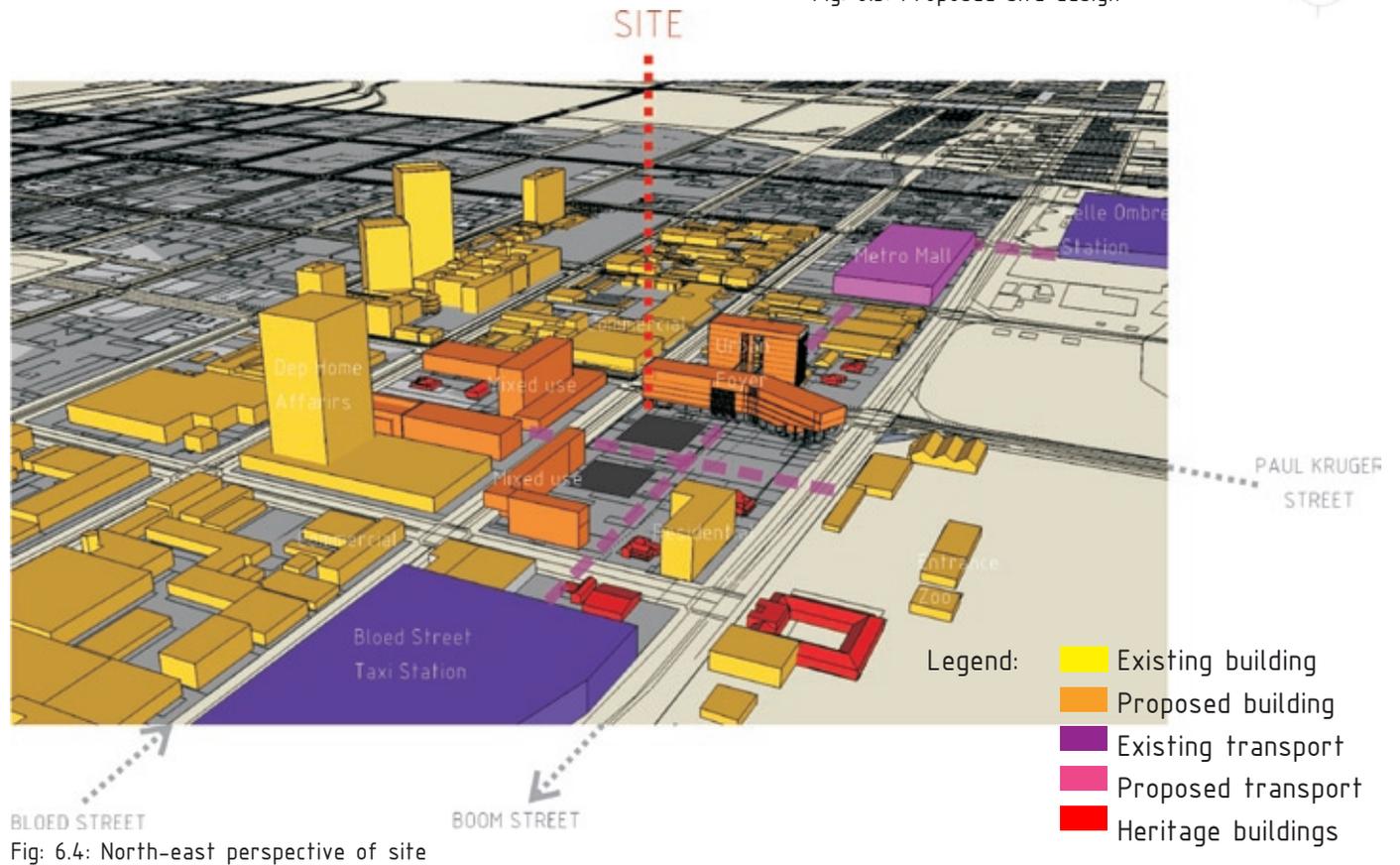


Fig. 6.4: North-east perspective of site



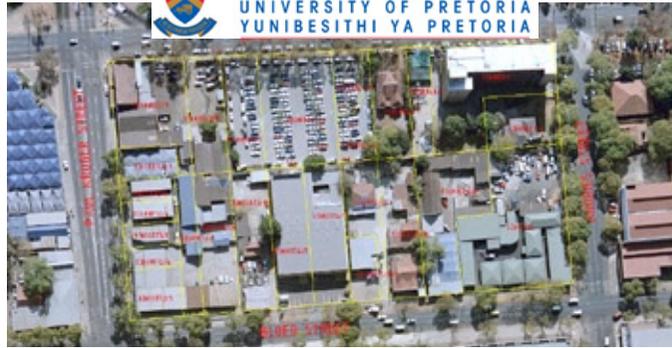


Fig: 6.5: Erf division before consolidation

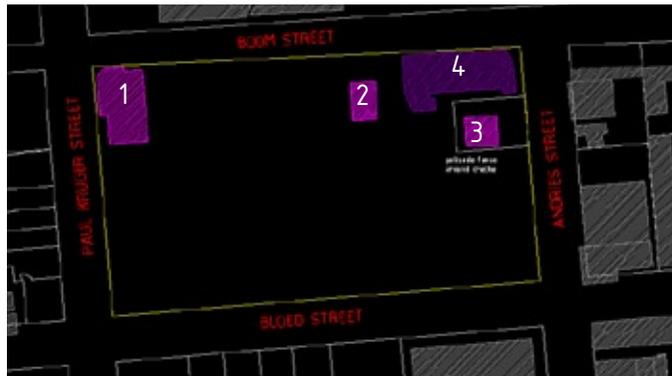


Fig: 6.6: Consolidation of erven on site

- Legend:
- Boundary
 - Heritage
 - Residential

Legal

All the erven on the site bounded by Paul Kruger, Boom, Andries and Bloed Streets are consolidated and sub-divided as sectional title. Several buildings that are earmarked for demolition by the Tshwane council remains due to their value on site.

Structures with heritage value are:

- the corner cafe from the Bazaar era located on the corner of Paul Kruger and Boom Streets.
- the single storey Victorian residential unit on Boom Street.
- the single storey Victorian residential unit on Andries Street.

A structure with social value is:

- the seven storey residential apartment complex on Boom Street.

The ground floor of the seven-storey residential apartment complex is to be converted to commercial units. The precast concrete fence around the creche is to be replaced by steel palisade fencing.

- 1: Corner cafe
Paul Kruger Street



- 2: Victorian residential
Boom Street



- 3: Victorian residential
Andries Street



- 4: Seven storey residential
Boom Street



Fig: 6.4: Structures with heritage and social value on site

DESIGN APPROACH

Building guidelines

Mixed use buildings are encouraged throughout the precinct. Buildings define a strong street edge with a 6000mm build-to-line. Maximum building height is 32m on the street edge and 18m on the pedestrian walkway edge.

The pedestrian walkway links Bloed Street Taxi Station and Belle Ombre Train and Taxi Station. The pedestrian walkway has a minimum 2500mm building line from the centre line. The mobile market units are located along the pedestrian walkway.

Activities on the ground floor are promoted on the street edge and the walkway edge. Fences are kept to a minimum, as site permeability is promoted by multiple access points on the site corners and street mid-points.

Unified design of street furniture and landscape amenities, such as water points, lights, benches, trees and trade stations is promoted.

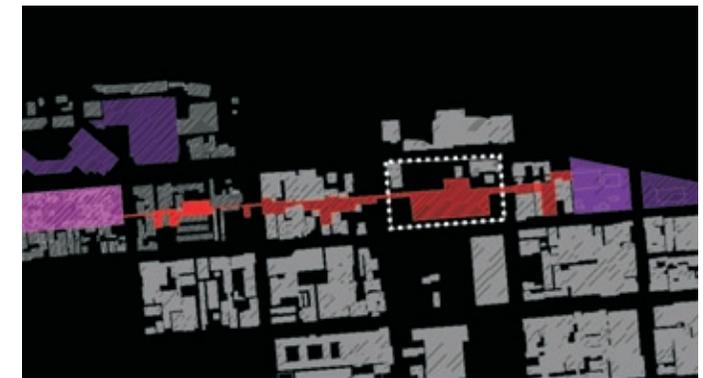
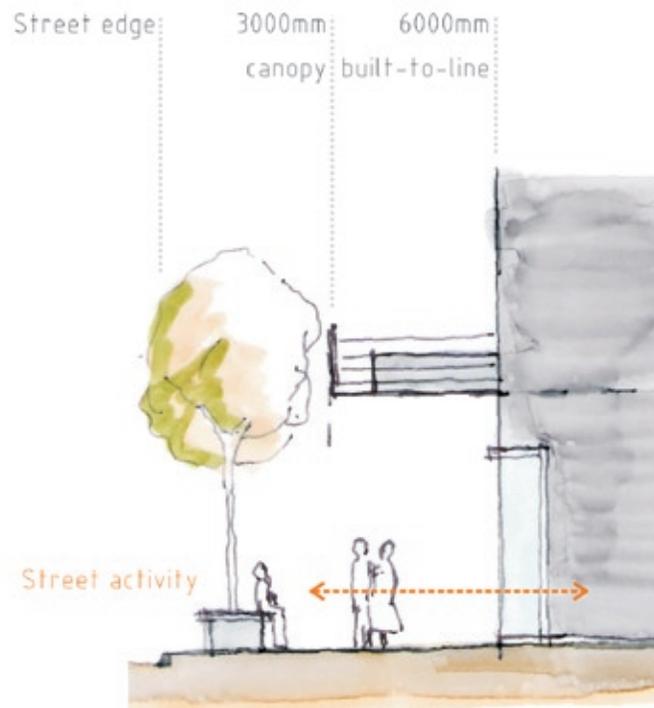


Fig. 6.6: General section and plan of pedestrian walkway

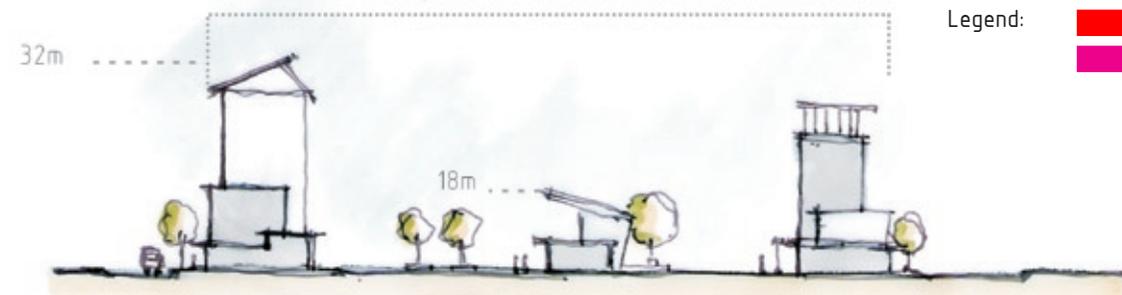


Fig. 6.8: Building guidelines in section



7. DESIGN DEVELOPMENT

Key words: Meeting place
Transition
Regulate
Diverse

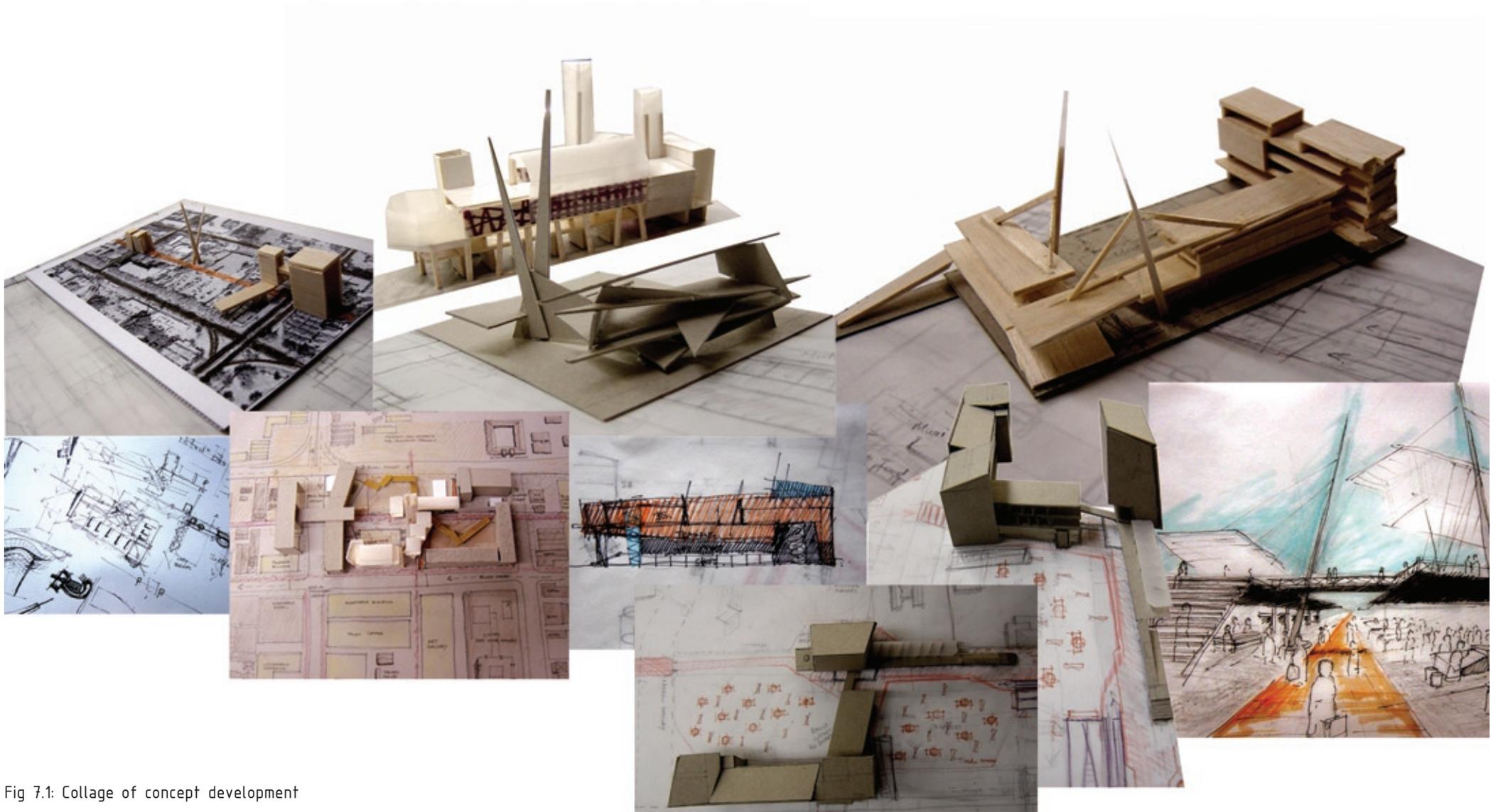


Fig 7.1: Collage of concept development

Concept One

The first concept is not on the site as described above. It is a parasitic intervention directly attached to the Bloed Street Taxi Station. The structure extends from within the taxi station west towards Andries Street. The aim of the intervention is to be an extension of the taxi station.

The design is feminine, welcoming, embracing. Soft curves wrap around the natural landscape to enhance the journey from rural environment into the urban context. Ramps guide the transition from road to building, increasing in height as the structure takes form and function.

The entire facility is raised into the tree canopy in order to free the user from the constraints of urban activities. It is a haven in which to rest and relax, to prepare for the transition into the city.

From this concept several design solutions evolved:

- The facility is dependant on the location of transport interchanges because it is the first place a person sets foot on urban territory
- The facility must have a sense of place, it must be grounded in the urban context

After evaluating the concept and its location, it was clear that the meeting place must be between the two transport interchanges. The reason is that the taxi stations service different areas. Thus Pretoria acts not only as a destination but also as an interchange between provinces.

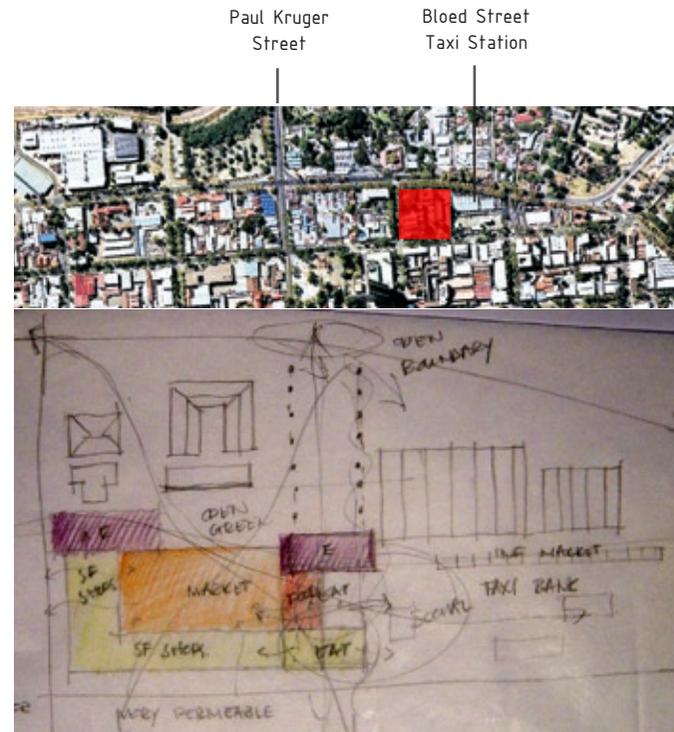


Fig 7.2: Plan of Concept One

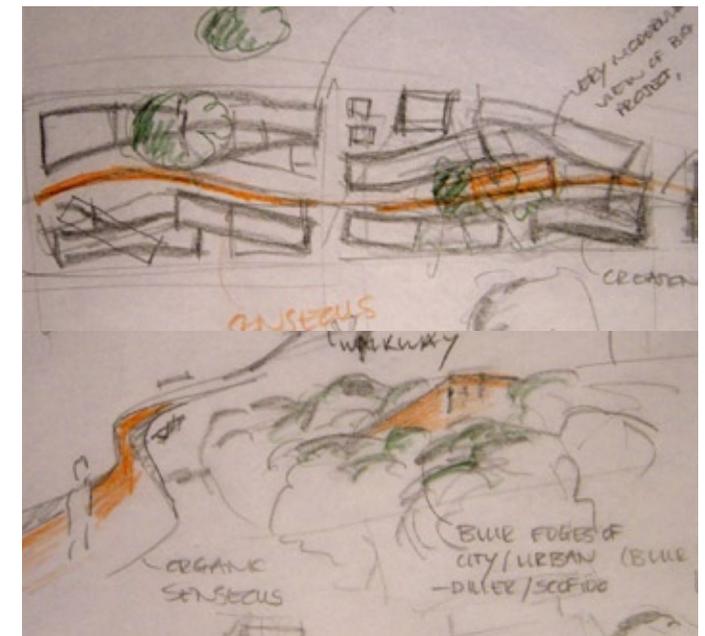


Fig 7.3: Illustrations of Concept One

DESIGN DEVELOPMENT

Transition facilities

There are various transition facilities in Gauteng. The Yeast City Housing Project is located in Visagie Street opposite Burgers Park. It provides social and educational support for people moving from the rural environment into the city. The clients are young adults in search of work, money and a better life. However, the principle behind the facility is that of aiding people who are employed with accommodation and education (Zanele 2007: Interview). This limits the client profile.

There are several transition facilities in Johannesburg due to the Transition Housing Programme initiated by the Inner City Shelter Forum of the Greater Johannesburg Transitional Metropolitan Council (GJTMC). The aim of these facilities is to develop and support personal upliftment programmes, establish linkages with training programmes, employment opportunities, encouraging entrepreneurship and assisting in business opportunities (Poulsen 2000).

The facilities are operated by various organizations such as Mes-Aksie and the Learn and Earn Trust.

The facilities are:

- Immaculate House in Rosebank
- Cornelius House in Marshalltown
- Putadijhaba House in Pageview
- Hi-Life Centre in Roodepoort
- Ekuthuleni in Joubert Park

The facilities have basic services, such as bakeries, laundries, second hand shops and public telephones. Most of the facilities have an open plan design and utilize robust materials in the structure for low maintenance. The fundamental point surrounding the facilities is that they are in constant and extensive use.

The Ekuthuleni project in Joubert Park is located in a building designed by Sir Herbert Baker. It was originally intended to be a Catholic Convent, before being converted into a Turkish Bath (Poulsen 2000).

According to Alan Lipman, a true example of transition in an urban context is the Mai Mai Bazaar in Johannesburg (Lipman 2003: 47). The bazaar is the social and economical centre of Zulu life in the Witwatersrand. It is near a long-range taxi terminus operating as a threshold into the urban context. The bazaar is alive with music, people, muti, beer, and workshops. Materials are robust and consists of baked brickwork, timber and corrugated and sheet iron.



Fig 7.4: A worker in the Mai-Mai Bazaar



Concept Two



The second concept is situated on the allocated site, bounded by Boom, Andries, Bloed and Paul Kruger Streets. The focus of the concept is the pedestrian link between the two transport interchanges. A solid element is situated in the pathway so as to obstruct horizontal movement. The element houses various self-help functions that facilitate the introduction of a rural immigrant into the urban context.

A second, larger solid element is situated against Bloed Street. This element houses regulated functions. The two elements are connected by a ground floor-market.

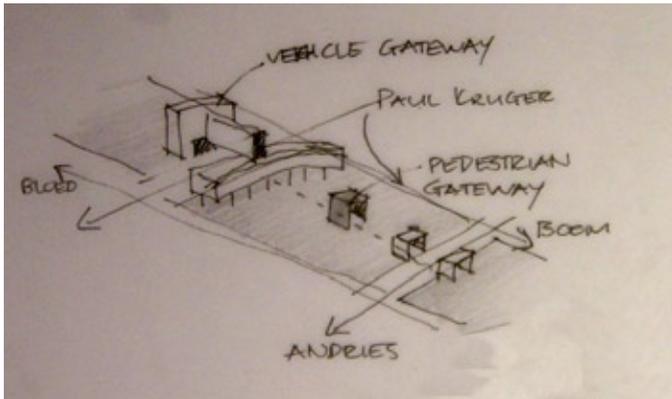


Fig 7.5: Obstruction in the pedestrian link

DESIGN DEVELOPMENT

From this concept several design solutions evolved.

- The project acts as an intervention between the two transport interchanges. It disrupts the regular linear movement pattern.
- The programme of the facility is divided into three components. The first is regulated functions situated in a controlled environment on the street barrier. The second is self-help functions in a managed environment next to the pedestrian link. The third is the self-regulating market that binds the first two components.
- In terms of scale, the street element is larger than the centre element. The street element addresses the city scale while the centre element addresses the human scale. Neither of the elements impose their dominance on the market. The market is framed by the two elements.

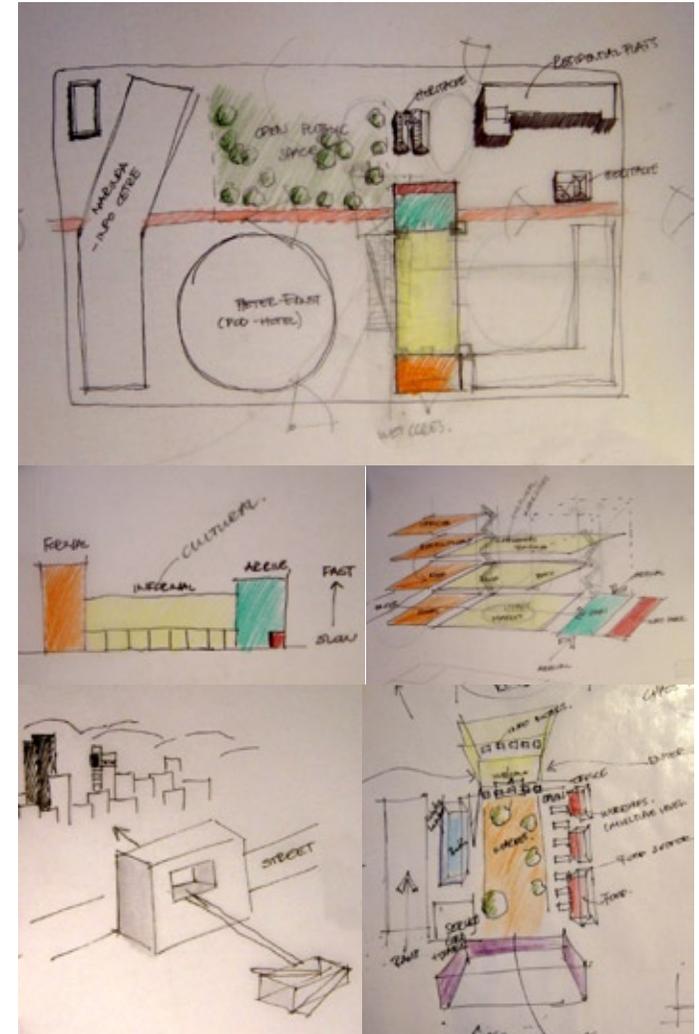


Fig 7.6: Component illustration of concept two

The Market

Markets are alive and bustling with music, smells and traders negotiating over their goods. There are various forms that a market can take. Three distinctly different markets are the Mercado Central in Maputo Mozambique, Warwick Junction in the Durban CBD and the Mansel Road Market on the perimeter of Durban CBD.

Mercado Central

The Mercado Central is in the centre of the Maputo CBD and it is the 'Forum' that relates commerce to governance in Maputo. The market is in close proximity to the harbour, the train station and various other public institutions, such as the library.

The market is enclosed with small perimeter shops that have entry points on the side of the street and the market. The market area is distinctly layered according to the goods sold. Fruit, vegetables and fish products are the main constituents of products for sale.

During heat waves the market closes, due to the stifling atmosphere generated by the corrugated steel roof and the lack of ventilation because traders store goods against the windows and walls.

The Mercado Central is a primary example of how commerce and governance intertwine in the urban fabric. The market is a vibrant, energetic environment where tourists, working class people and traders interact.

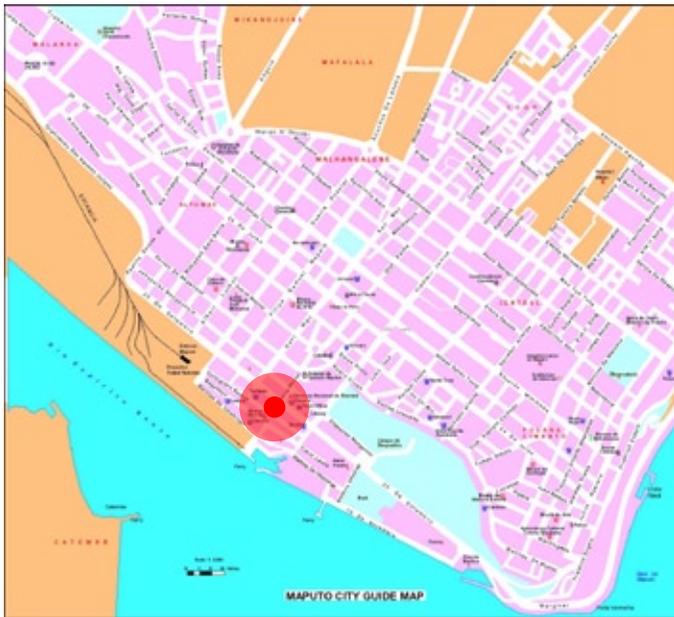


Fig 7.7: Location of Mercado Central in Maputo



Fig 7.8: Entrance to Mercado Central



Fig 7.9: Interior of the market



Fig 7.10: The market in action



Warwick Junction

Apart from being a market area, Warwick Junction is one of Durban's most dynamic transport interchanges and trading hubs. It is located at the Berea Road Rail Station, various taxi terminuses and the Victoria Street Bus Terminus.

The market extends from the streets to squares, from internal covered markets to external street vendors, from formal herb and bovine cooking markets to informal stair and floor markets.

Everything is on sale at the Warwick junction. The atmosphere is electric as some 300,000 commuters pass through the different areas between the train and taxi stations on a daily basis (Dobson 2001: 8).

Herbal traders are located in a unused freeway overpass, and the bovine head cookers are supplied with concrete working tops. Traders have locking facilities and vendor tables.

Warwick Junction is an evolution in market design as it recognises the importance and relevance of informal traders. It incorporates the basic requirements of the traders into the market design.



Fig 7.11: Bridge roof to herb market



Fig 7.13: Bovine market



Fig 7.12: Location of Warwick Junction in Durban



Fig 7.14: Herbal market

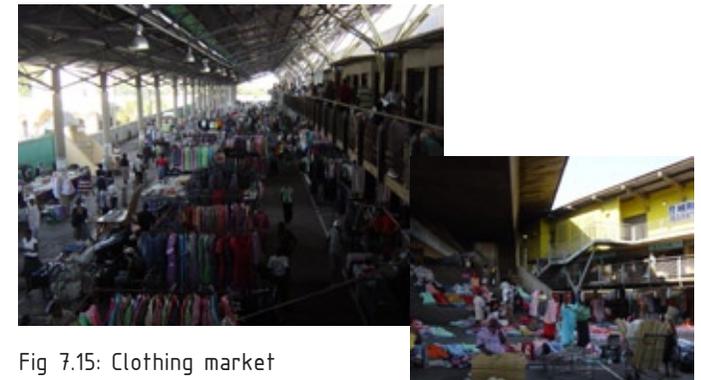


Fig 7.15: Clothing market

DESIGN DEVELOPMENT

Mansel Road Market

The market is situated in Greyville, Durban. The core of the market lies in accommodating travellers on the long haul-busses predominantly from Limpopo and Mpumalanga. The peak time of the market is between 23h00 and 01h00. In some cases traders sleep on the pavement and customers wake them up to purchase their goods.

Trading and accommodation are intertwined in the Mansel Road Market. The trading units are designed so that there is a living compartment at the back, storage in the centre and a trading compartment at the front. However, in practise all the space is used for accommodation while storage has been moved to the roof.

Women selling industrial waste are the most influential traders. There are also 180 bays for car boot sales and 180 bays for pinafore ladies (Harber 1997: 6). Public showers are adjacent to the shop and luggage holding area. Hot water showers are provided at a cost of R3-00 each.

The Mansel Road Market showcases that markets are dynamic and diverse. Traders manipulate function and space in order to satisfy their needs.

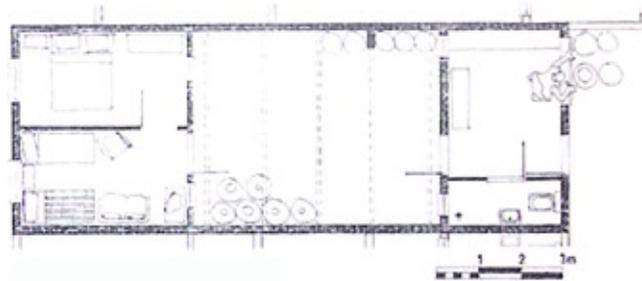


Fig 7.16: Photograph and plan of trading units

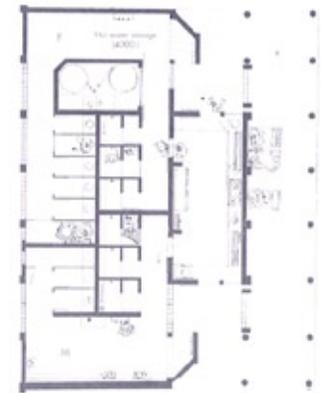
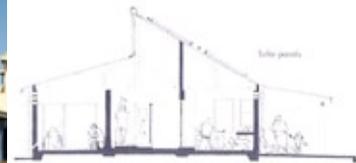


Fig 7.17: Photograph, section and plan of shower facility



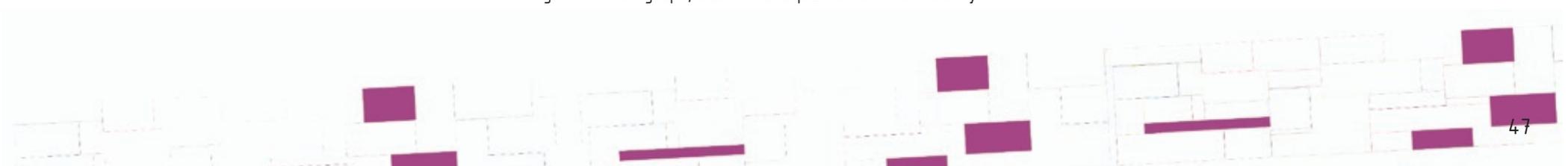
Fig 7.18: View along trade front



Fig 7.19: Storage on the roof



Fig 7.20: Pinafore market



Concept Three



This concept involves consolidating the importance of the market by giving it a definite sense of place. Two large vertical spires are constructed at the intersection point between the market, the pedestrian link and the urban square. The vertical spires are the meeting place, the reference point, the starting point.

The scale of the vertical spires is such that when entering the CBD from Paul Kruger Street they are clearly visible and identifiable. The two spires anchor the various functional planes that compliment the activities in the market. The planes are each expressed in their own right, protruding from a central point in the direction of the city. When the planes encounter the street, an invisible vertical barrier bars the planes in order to create a smooth street line.

The northern edge of the market is framed by open planes gliding past one another, giving shadow and form to the activities. The southern edge is framed by the planes that abut the street barrier.

DESIGN DEVELOPMENT

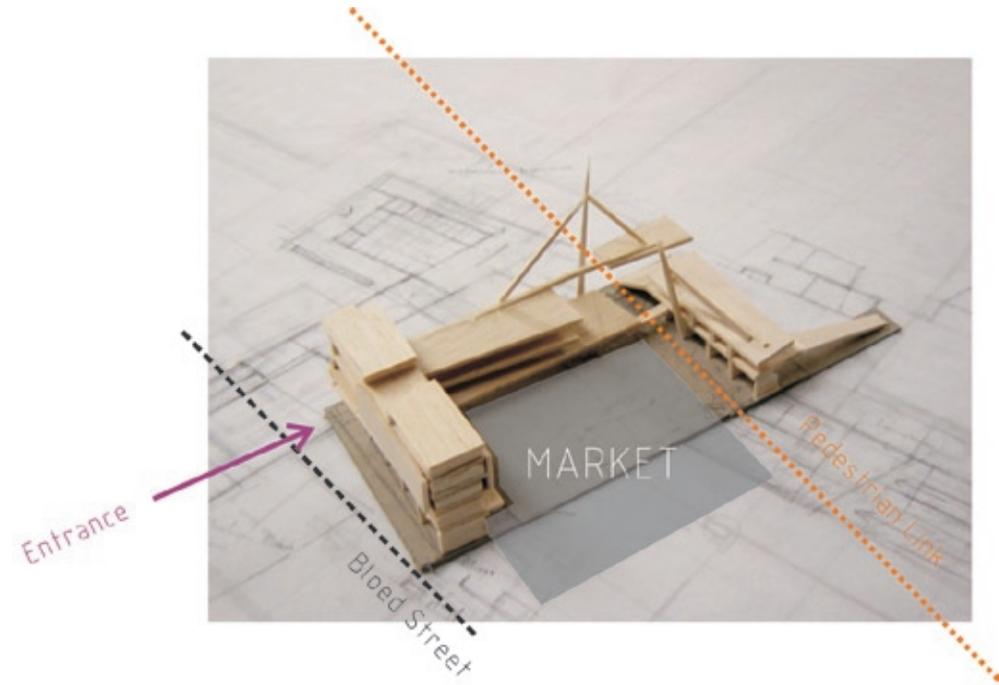


Fig 7.21: Market framed by structures

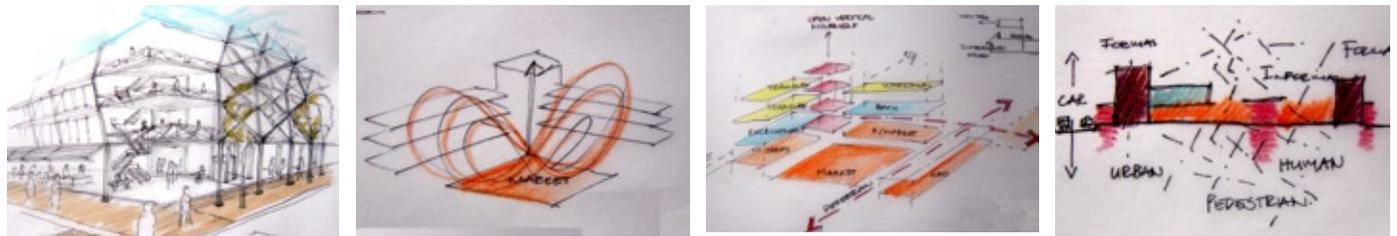


Fig 7.22: Concept Three sketches



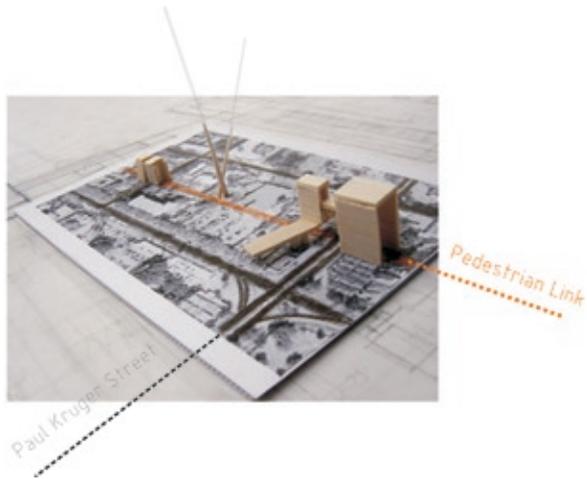


Fig 7.23: Vertical spires from Paul Kruger Street



Fig 7.24: Meeting point at the spires



Federation Square: Melbourne

The structures framing Federation Square are on a human scale. They compliment each other in terms of orientation, scale and construction materials. Shops open up onto the square and several ad hoc activities happen on the square during the day and the night. The site is permeable and accessible, encouraging the use of the square by workers, visitors and commuters (Gaventa 2006: 24).



Fig 7.25: Human scale of Federation Square in urban context

Kunsthall: Rotterdam

The main objective for the Kunsthall design is to invite the public into the building by using transparent materials in strategic locations (Metz 1993: 68) An unusual feature is the glass facade of the auditorium. This allows the auditorium spectators to become performers for the outside public. The use of a transparent facade enhances the communication between the outside and inside.



Fig 7.26: Transparent facade exhibiting auditorium spectators

DESIGN DEVELOPMENT

Sharp Centre for Design: Toronto

The Sharp Centre for Design is an extension of the Ontario College for Art and Design (OCAD). It is a steel 'table top' structure suspended in the sky on twelve multi-coloured steel legs. The legs create a vibrant and dynamic relationship between the structure and its environment.

The rectangular structure is situated above the original OCAD building. This indicates the respect the rectangular structure has for the original building and the ground floor activities.

The project has been praised by the *Toronto Urban Design and Architecture Awards* in May 2005 for its excellent relationship with the public realm (OCAD 2006).



Fig 7.27: Perspective of Sharp Centre for Design



Concept Four



The protruding planes are given form and function. The structural language of the three components is enhanced to increase each component's identity. The street structure is bound by an encapsulating roof that frames all events and programmes within the structure. This gives a definite southern edge to the market area.

The dynamic quality of the structures framing the market is increased by relocating the rigid street component west of the protruding factory frame. The protruding factory frame communicates with the interior pavilion and the market. The façade of the frame is transparent in order to increase the communication between the activities inside the frame and the market. The frame overlooks the interior pavilion.

The interior pavilion is an open structure that communicates with the market and it is an extension of the ground floor. The pavilion acts as a permeable filter between the market and the urban square.



Fig 7.28: Perspective from Boom Street

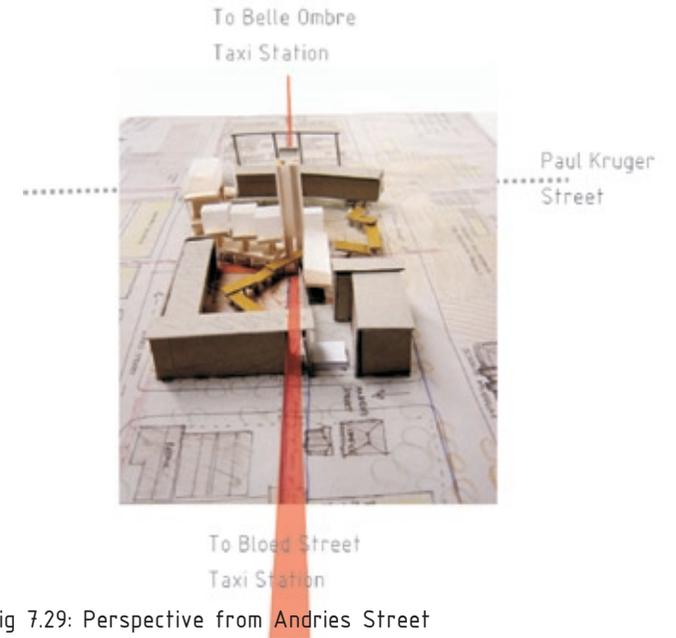


Fig 7.29: Perspective from Andries Street



Fig 7.30: Scale of structures

DESIGN DEVELOPMENT



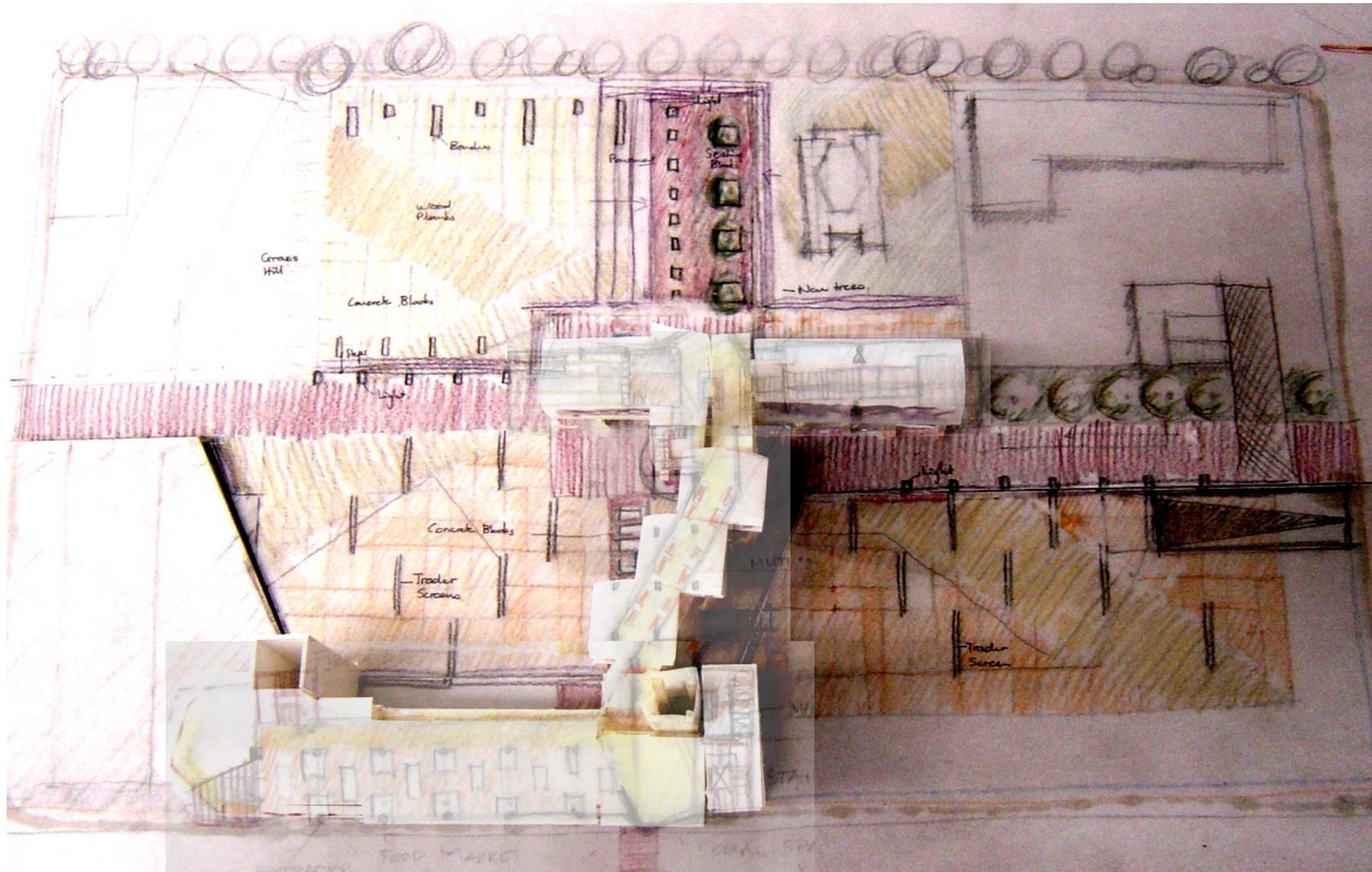


Fig 7.31: Concept Four plan



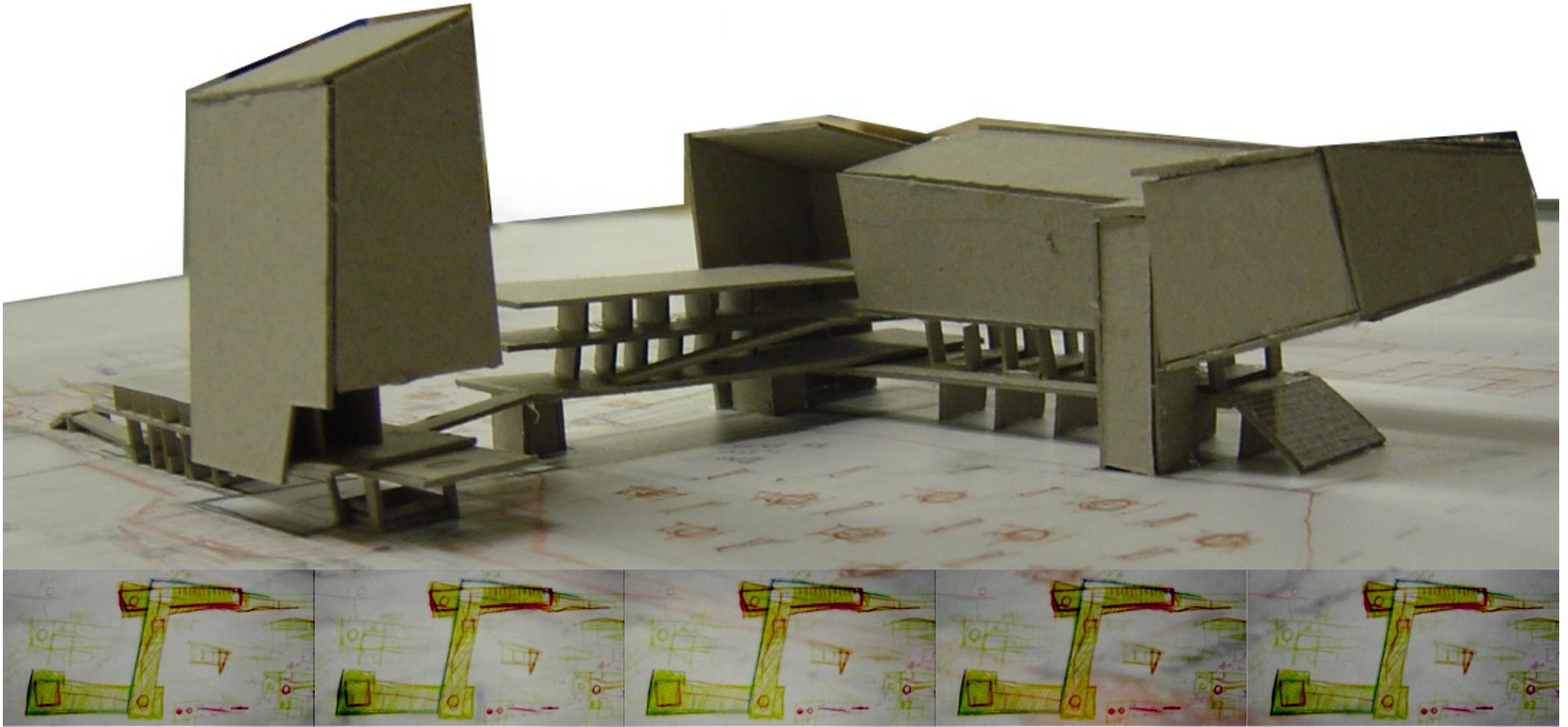


Fig 7.32: North perspective from Boom Street

DESIGN DEVELOPMENT



The dynamic character of the structures is enhanced with dynamic linear profiles projecting on each other. This generates an architectural language in which the structures communicate with each other in order to create a cohesive whole. The aim is to strengthen the structural language of each component. This gives dignity and identity to the structures.

The communication between the structure and the street is enhanced by the addition of prominent vertical movement elements. The structure is seen as an extension of the street and not a solitude component apart from the urban fabric.

The ground and first floor are constructed from reinforced concrete. This anchors the structure to the earth. The upper levels are constructed from steel profiles. The contrast between the robust heavy concrete and light steel enhances the duality of the rural and urban environments.

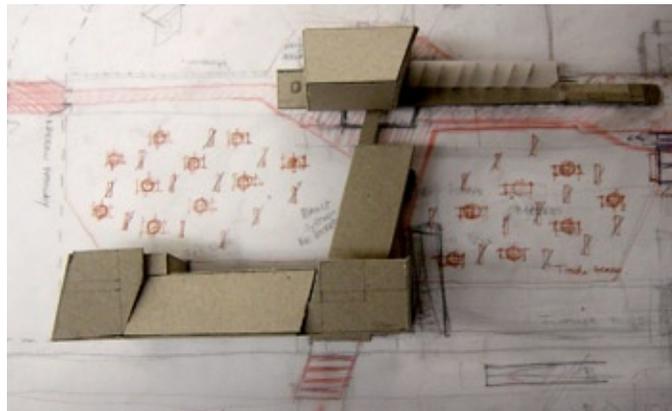
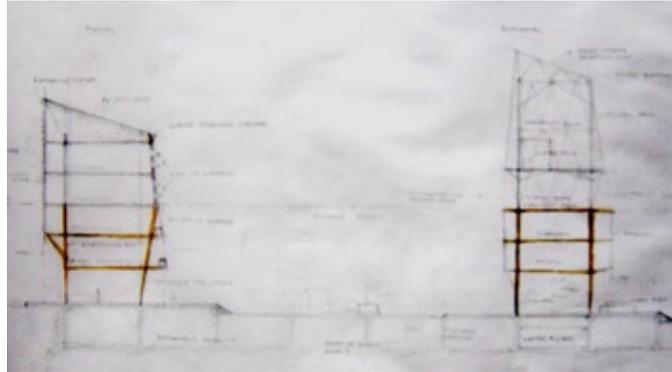


Fig 7.33: Concept sketch and model plan

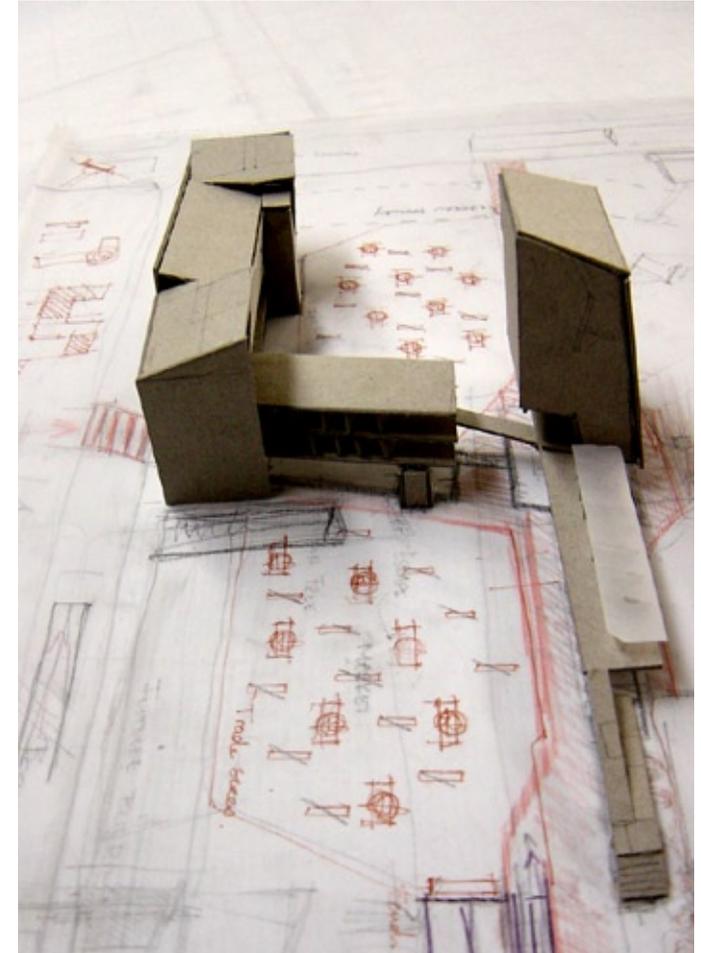


Fig 7.34: East perspective from Andries Street



8. DESIGN IMPLEMENTATION

Key words: Horizontal
Vertical
Communication
Third landscape

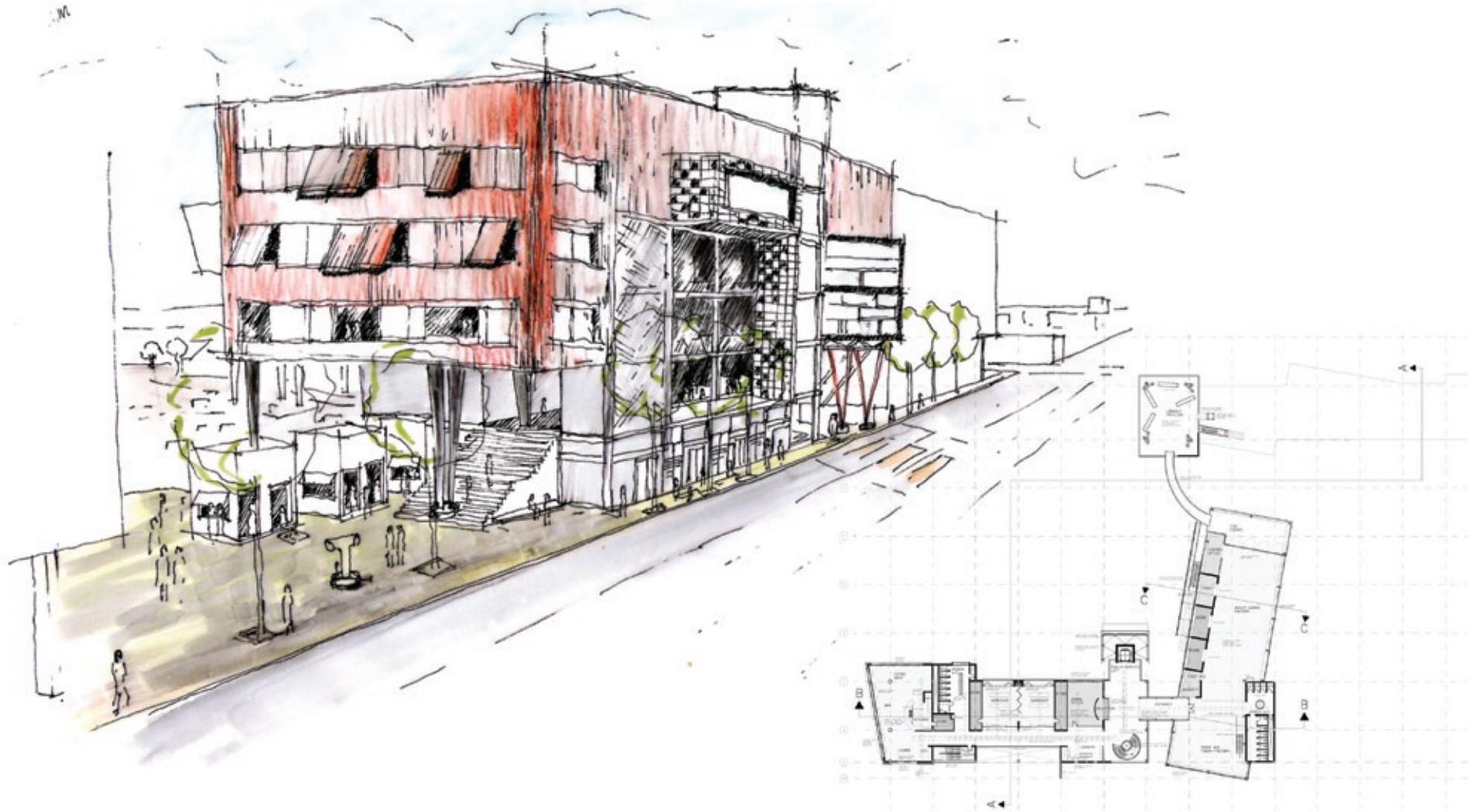


Fig 8.1: South-west perspective and second floor plan collage



Vector design program

The design recognises the different layers of interaction between the human mind and the built environment. The horizontal vector design differentiates between the structured interaction and the diverse interaction. Structured interaction occurs on the street perimeter while diverse interaction occurs within the site.

The vertical vector differentiates between the levels of interaction between the building and the user as a function of time. Each level represents a degree of understanding the complex mechanics and language of the urban environment. Each level is a different approach to understanding and ultimately negotiating the urban context.

In the vertical vector design the ground is seen as solid heavy earth connected to the basic survival of the urban context. The sky is seen as the summit to reach in order to understand and negotiate the urban context. The levels in between is the process between surviving and negotiating the urban context. This is analogous to the view from the structure into the city.



Fig 8.2: Horizontal vector design

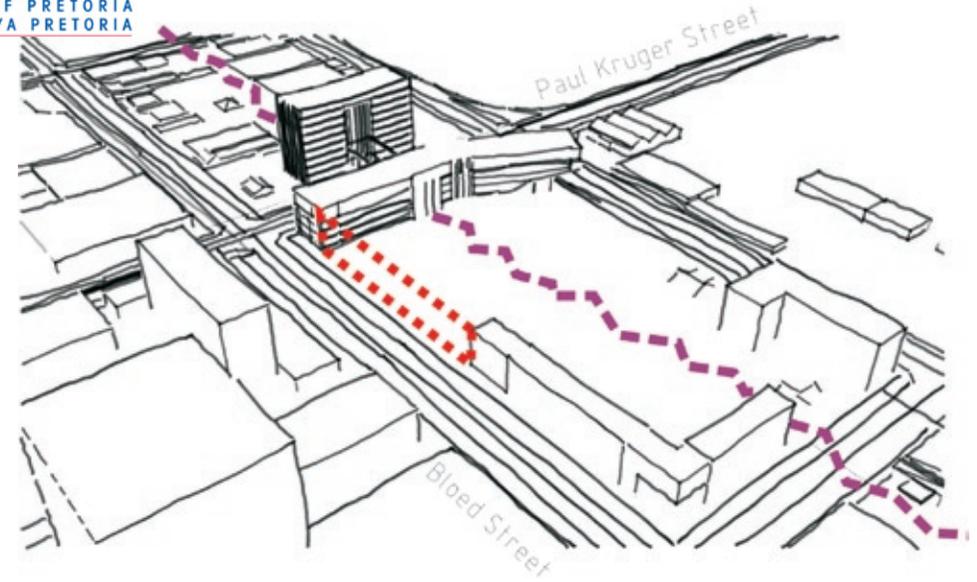
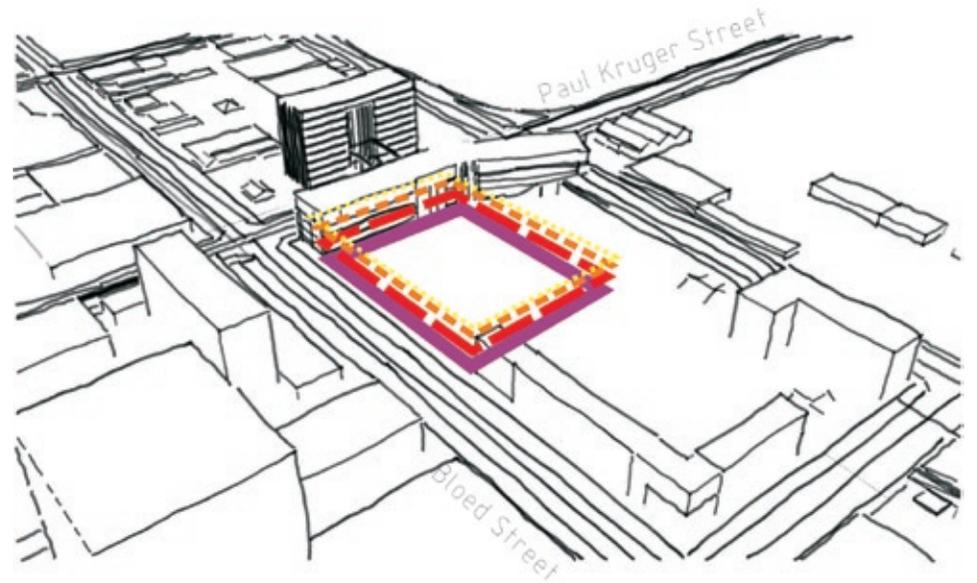


Fig 8.3: Vertical vector design



DESIGN IMPLEMENTATION



In order to accommodate the horizontal and vertical vector system in the design of the facility, it is necessary to allocate (predict) the most favourable locations for each structure.

The optimum location for the structured interaction is adjacent to Bloed Street. Bloed Street forms a metaphysical linear boundary framing the internal activities. The street itself represents everything that is functional, pragmatic, logic, mechanic and structured. The street is the grid, everything conforms to the will of the street.

The pedestrian walkway is free from the constraints of the street. The walkway act as an extension of the market, a social space, a place to rest or a performance space. The open pavilion is located along the pedestrian walkway.

The market represents the 'Third Landscape' where space is open to diversity, interpretation and performance. The dynamic factory frame is located over the market.

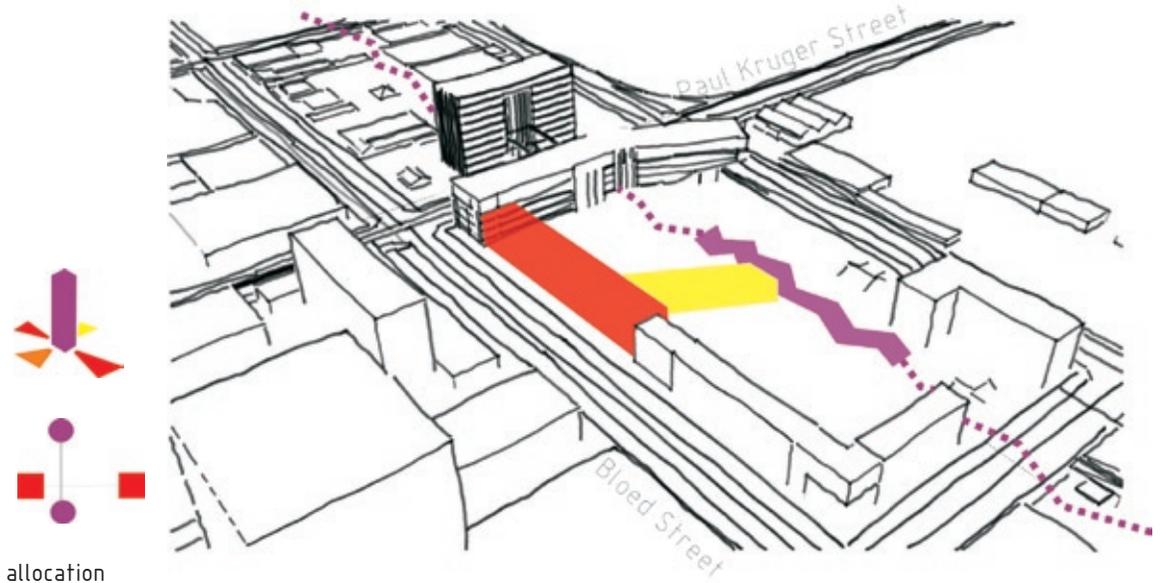


Fig 8.4: Structure allocation

- Legend:
- Rigid box
 - Dynamic frame
 - Open pavilion



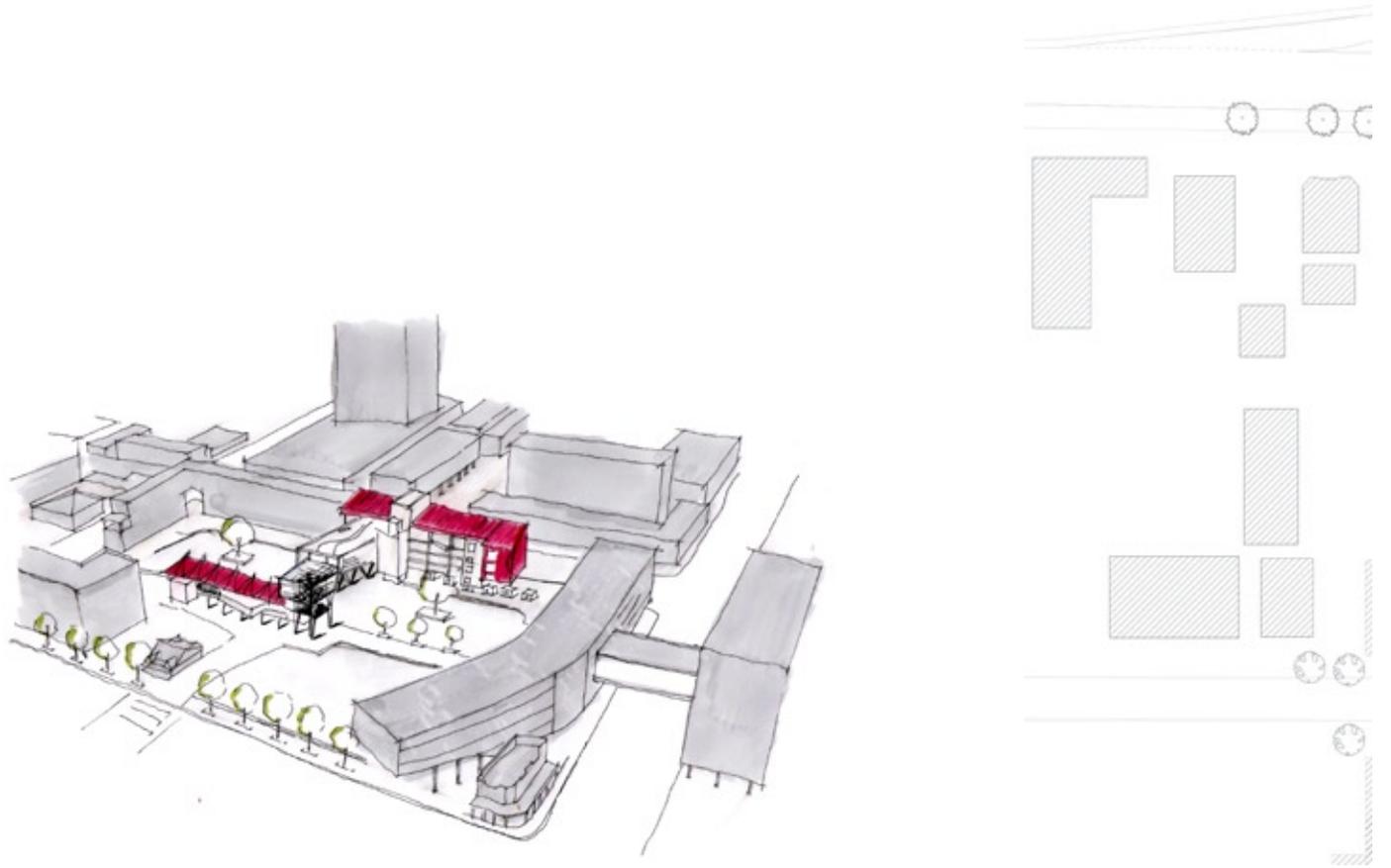
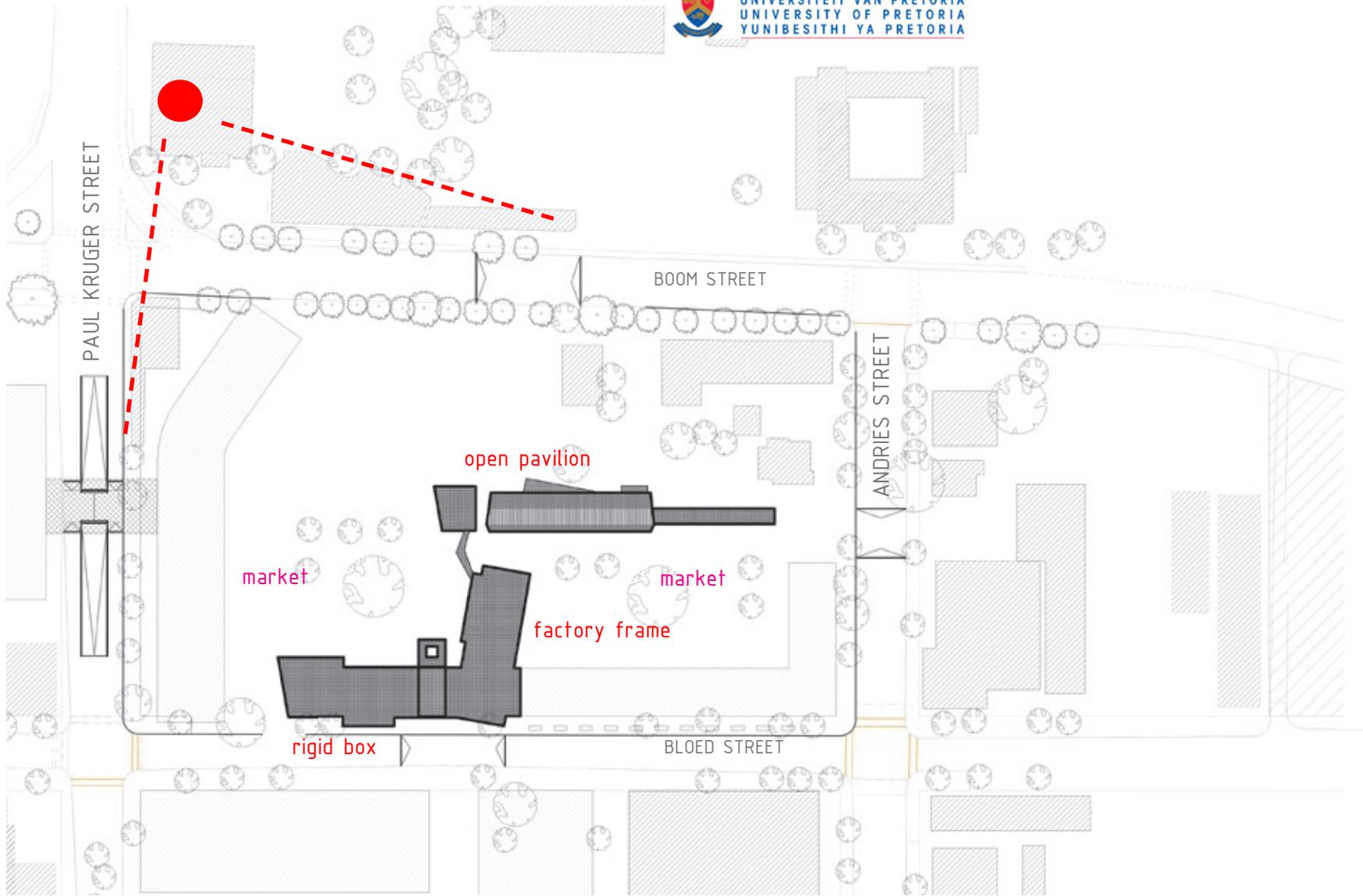


Fig 8.5: North-west perspective and site plan

DESIGN IMPLEMENTATION





The Market



The market is the focal point of the mobile market units. It is located on site at the intersection between the east-west and the north-south pedestrian walkways. The mobile market units operate beside the east-west pedestrian walkway that connects Bloed Street, Belle Ombre and Metro Mall transport interchanges. The north-south walkway connects the city with the Zoological Gardens. The market is a connection point and a destination.

The market is an opportune meeting point between the rural immigrant and the urban context. The market is seen as the 'Third Landscape' (Clement 2006: 90). It is a space open to performance, interaction, communication and diversity. The diversity of the traders and the mobile units form the fabric of the market.

SITE

Existing Belle Ombre Train and Taxi Station

Proposed Metro Mall

Paul Kruger Street

Existing Zoological Gardens

Existing Bloed Street Taxi Station

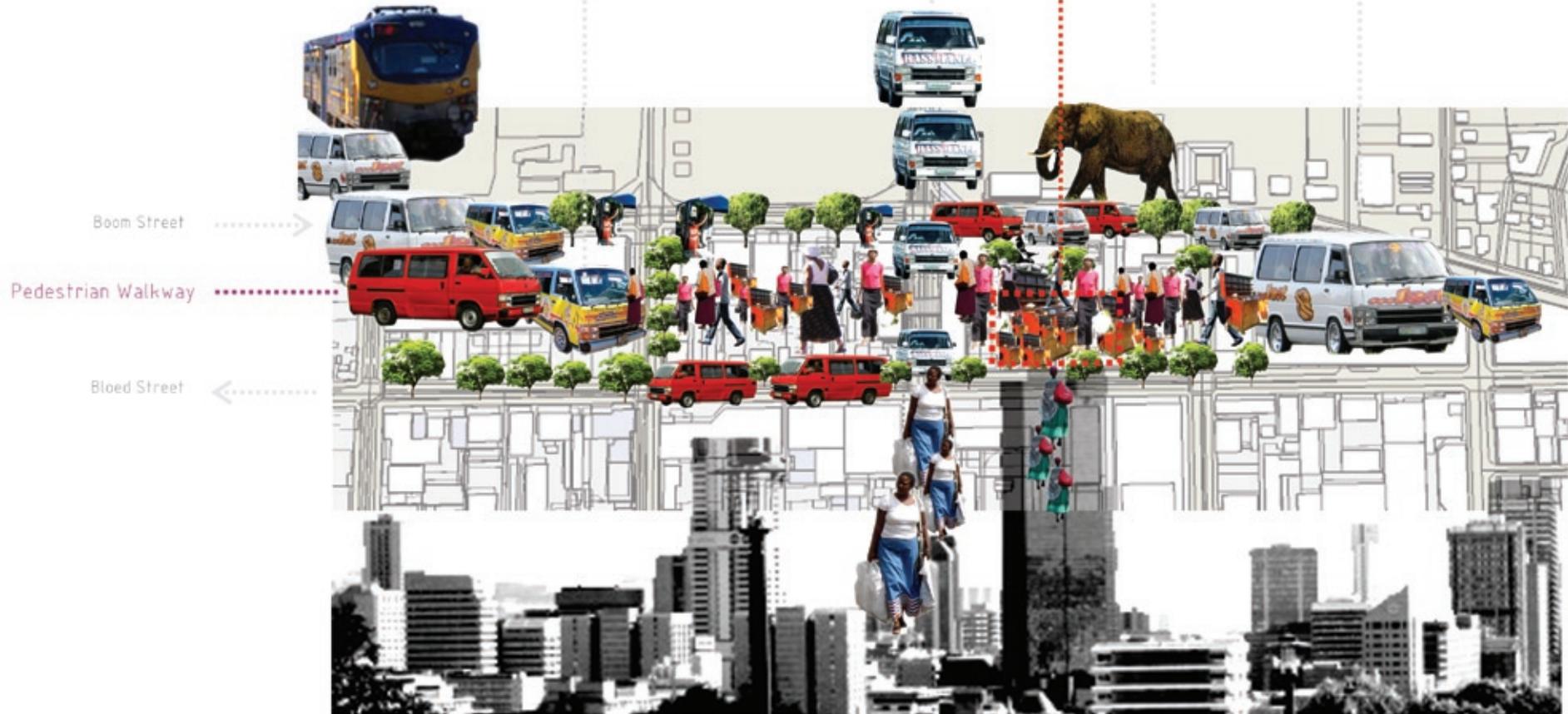


Fig 8.6: Strategic location of market



Basic amenities are provided in the market area in order to create favourable trading clusters. The clusters are located at trading stations, benches and trees.

The predominant material used in the market area is reinforced concrete due to its robust nature. The surface material of the market is 1200x800mm cast in-situ concrete blocks separated with 50x50mm black and white mosaic tiles. The concrete blocks are rotated 10 degrees east of north in order to follow the line of the dynamic factory frame.

Reinforced concrete trading stations with storage compartments allow for quasi-permanent trading locations. Elevated reinforced concrete platforms allow for products to be displayed and functions as performance platforms. Deciduous trees give natural shade in the summer and allow sun in the winter. The market is lit at night in order to facilitate night activities.

The market is framed by the rigid box on the south perimeter and the open pavilion on the north perimeter. The factory frame is a spectator overlooking the market.

DESIGN IMPLEMENTATION



Fig 8.7: Trading cluster in market



Fig 8.8: Plan of focal market on site

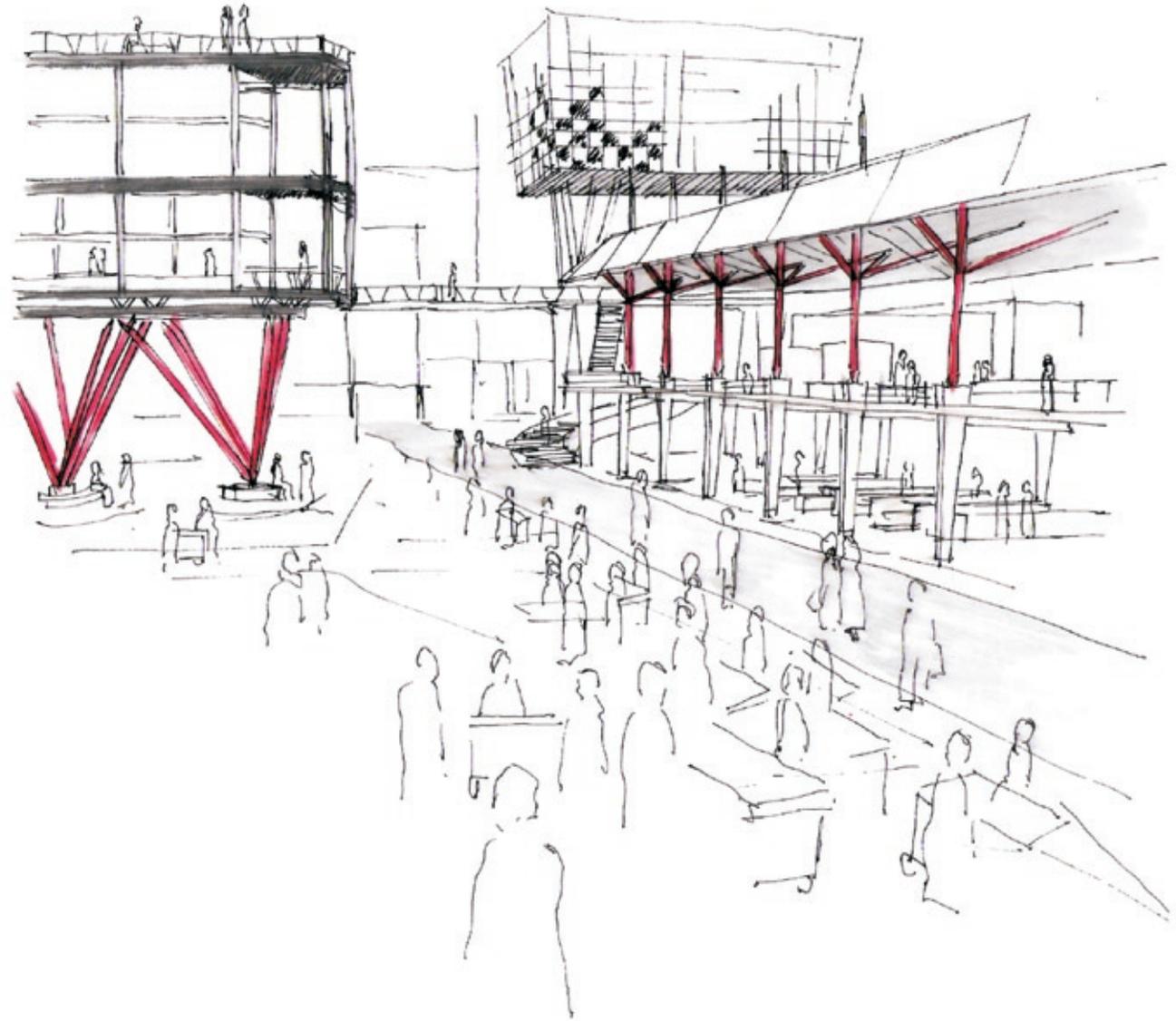


Fig 8.9: East view of market



The Rigid Box



The rigid box structure is the epitome of the vertical vector design principle. The ground floor is part of the everyday urban life. It comprises of retail and public rest rooms. The retail component is divided into shops and traders. The shops accommodate small and medium-sized retailers to encourage entrepreneurs and micro retailers. The traders have stations on the street to encourage street activity.

The shops are designed to form two walkways, an exterior on Bloed Street and an interior within the structure. The structure is punctuated on the market side (north) in order to increase interaction space between retailers and clients. The larger shops are accessible from the street (south) and the market (north) to encourage pedestrian flow between the two spaces.

The ground floor extends toward the market. It is elevated 850mm above the market plane in order to create a platform from where to view the activities happening in the market.

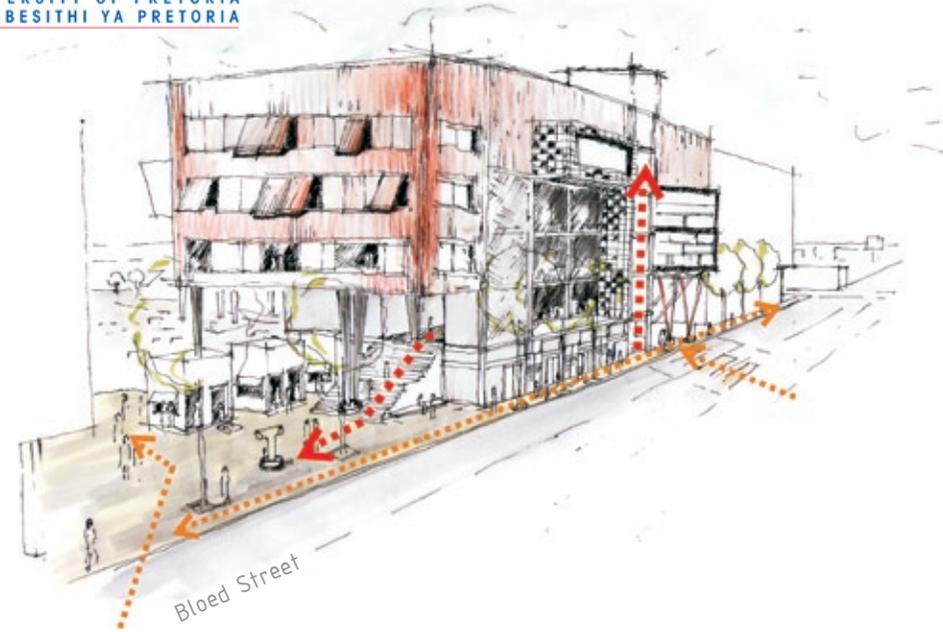
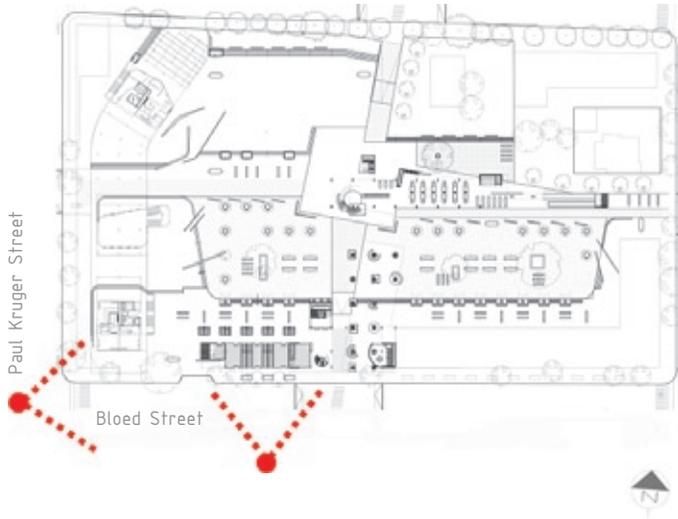


- Legend:
- Shop A - Large
 - Shop B - Medium
 - Shop C - Small
 - Trade stall
 - Movement

Fig 8.10: Ground floor accommodation

DESIGN IMPLEMENTATION





There are two entrances to the structure. The west entrance is a series of large steps, 6000mm wide, visible from Paul Kruger Street. The large staircase is a clear indication that the building is an extension of the street and not an object next to the street. The main entrance is in line with the north-south pedestrian walkway and comprises of a 3000mm radius spiral staircase and an elevator.

The spiral staircase causes a disruption in the horizontal and vertical design indicating that it is a place of importance. It is the element that connects the horizontal vector with the vertical vector.

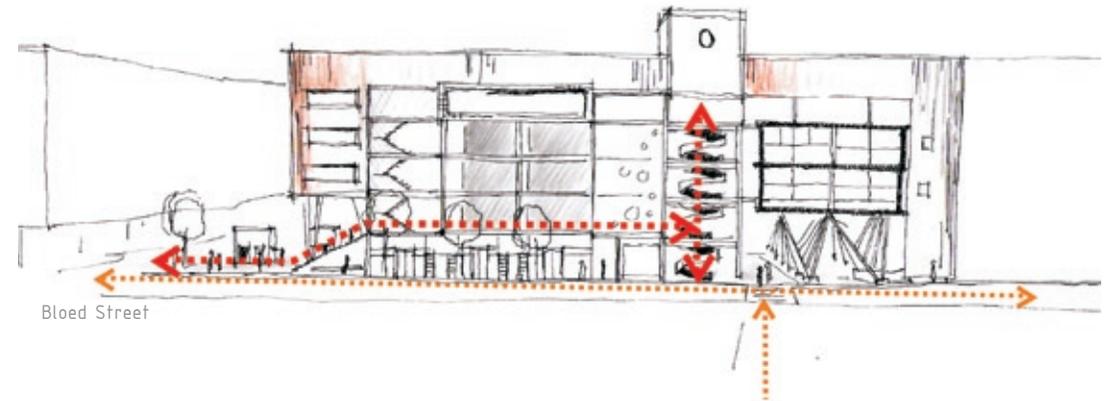


Fig 8.11: Entrance to rigid box structure



The first floor is an information centre in order to facilitate basic orientation in the urban context. The first floor is accessed from either the west or the east. The two entry points allow the first floor to become a semi-private extension of the street below.

The layout of the structure is planned so that circulation is on the southern perimeter and functional activities on the northern perimeter. The rest rooms are on the northern perimeter in order to have a view of the market. Basins are designed to be social spaces where people meet.

Self-help information is attached to screens that can be examined at leisure. In addition, an open plan information office assists with various inquiries. It is a recruitment office where information on work, health, education and housing can be obtained.

The first, second and third floor is open to Bloed Street. This allows direct communication with the street and the city.

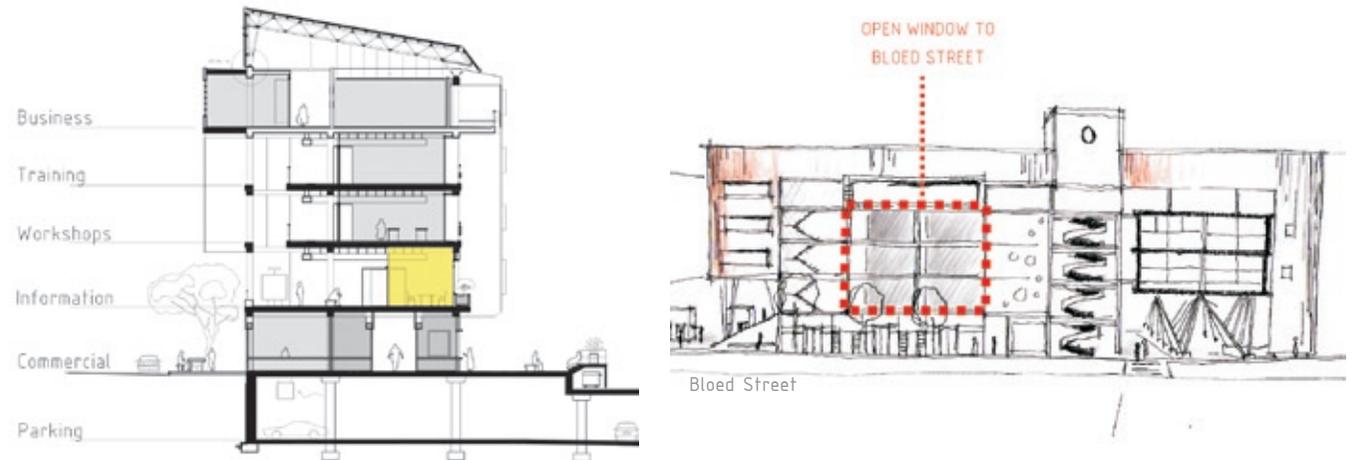


Fig 8.12: South elevation

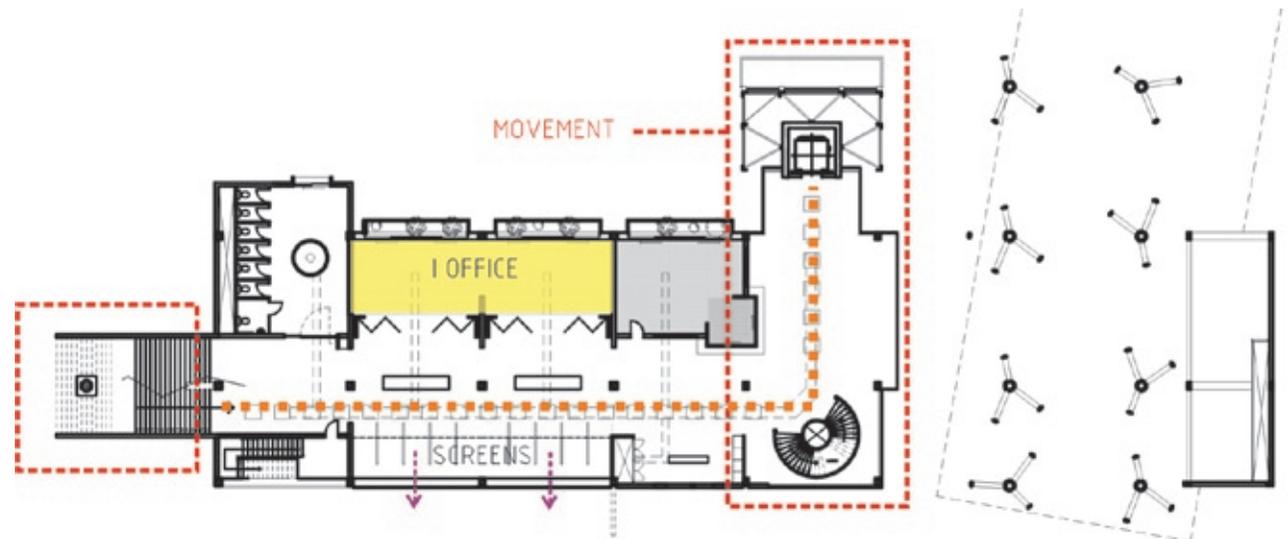


Fig 8.13: First floor accommodation

DESIGN IMPLEMENTATION

The second floor comprises the factory entrance, workshops and a cafeteria. The factory entrance is a white steel plated box projecting from the foyer into the factory. The entrance is suspended over the space between the rigid building and the factory in order to emphasize the threshold.

The two workshops are situated on the northern periphery of the building to capture the sunlight during the winter. The door between the two workshops can be folded away to create a single large workshop if needed. The northern façade of the workshops comprises of folding doors that opens onto the market. This allows for direct communication between the process and the product.

The 3000mm walkway acts as an extension to the workshops to encourage interaction between people when they move in or out of the workshops. Communication between the first, second and third floors are enhanced with a triple volume cut into the floor slabs adjacent to the walkway.

The cafeteria is located on the western edge of the structure as to communicate with people entering the market from Paul Kruger Street and Bloed Street. It is the meeting place where people can sit and relax. Ribbon windows allow for natural ventilation and sunlight in the cafeteria.

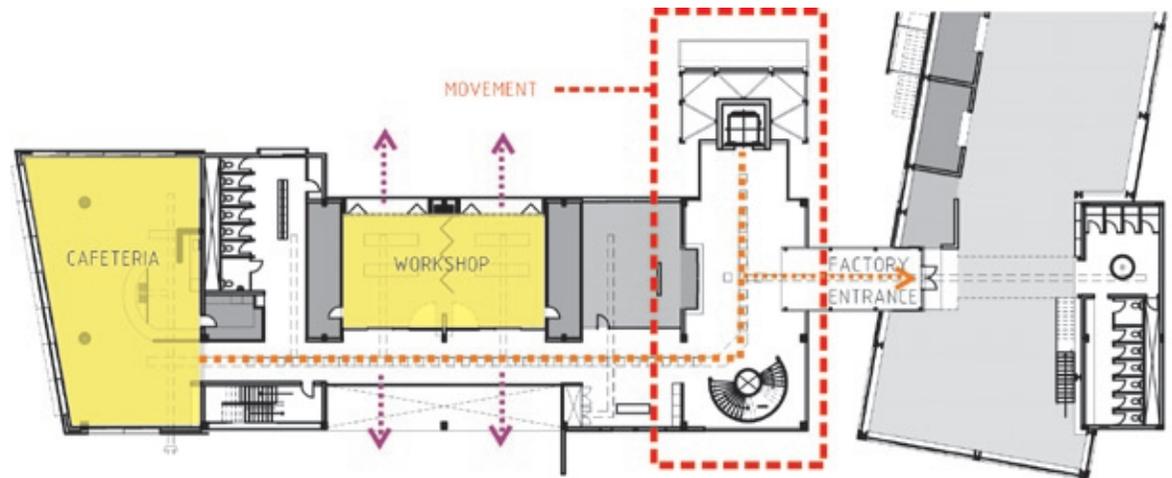
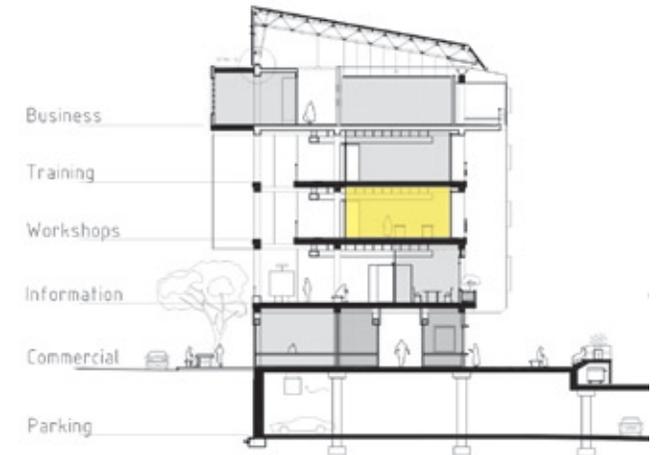


Fig 8.14: Second floor accommodation



The third floor comprises training rooms and offices for the Metro Trading Company (MTC). The third and second floors work together to form the educational facility for the factory.

The two training rooms can work separately or they can be combined by folding the dividing door away. The doors on the northern façade can fold away to increase the communication with the market. The 3000mm walkway acts as an extension to the training rooms to encourage interaction between people when moving in or out of the workshops. The south façade is punched to create a framed view of the building opposite Bloed Street and the city skyline.

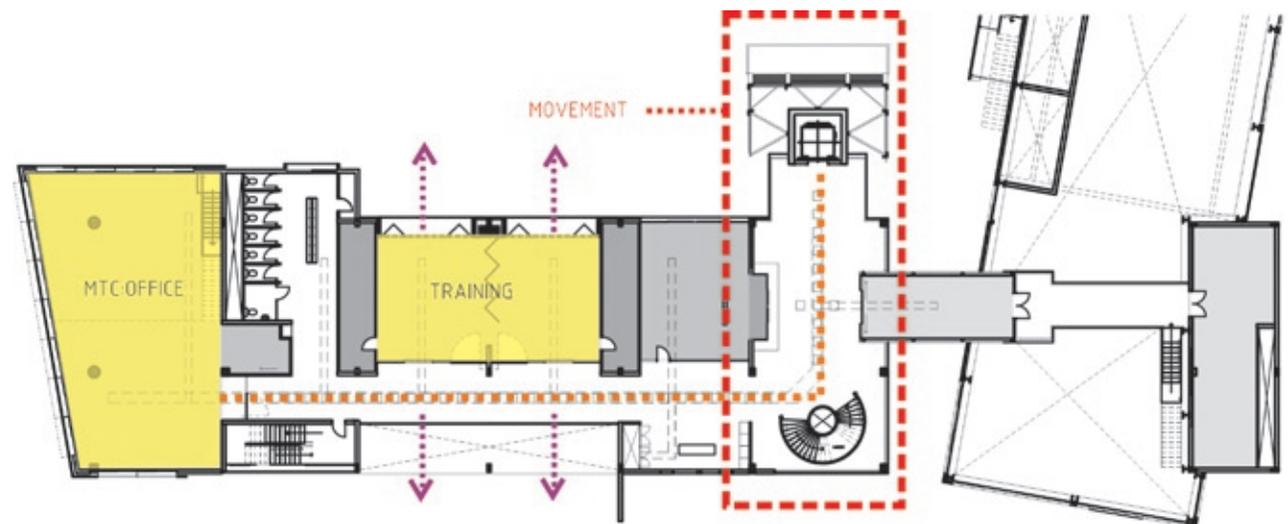
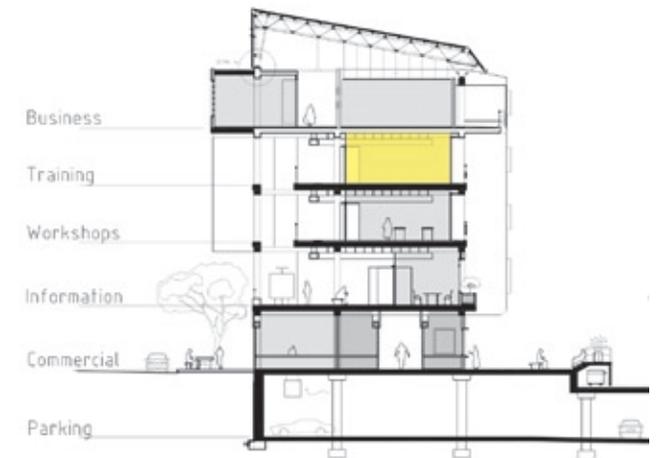


Fig 8.15: Third floor accommodation

DESIGN IMPLEMENTATION



The fourth floor is the public service floor and houses the management offices of MTC. The public services include a media and computer room and a resource centre (library). The media room is a rectangular box that punches through the south façade of the building to announce its presence to the city. The media box therefore has an unspoiled view of the buildings opposite Bloed Street and the city skyline. It is within this box that the feeling of being above the city exists. The library has a balcony on the northern perimeter that acts as a viewing platform from where the market activities can be seen.

The building is encapsulated by a sheet metal roof that folds around the walls from the roof to create the impression that the structure needs to be tied down to the earth. Only the shaft over the spiral staircase cannot be contained as it punches through the roof into the sky. The shaft is covered with coloured Plexiglas panels. The result is that the foyer is basked in different colours of light during the day.

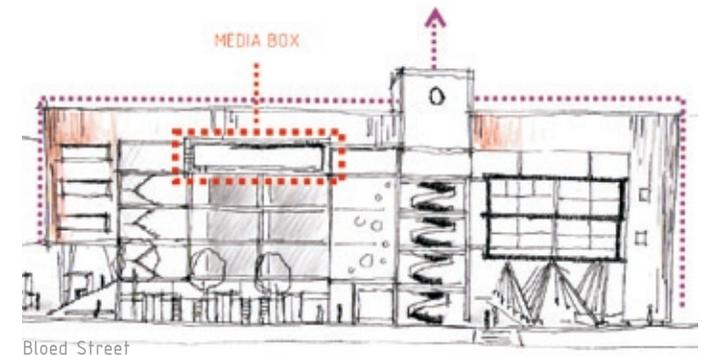


Fig 8.16: South elevation

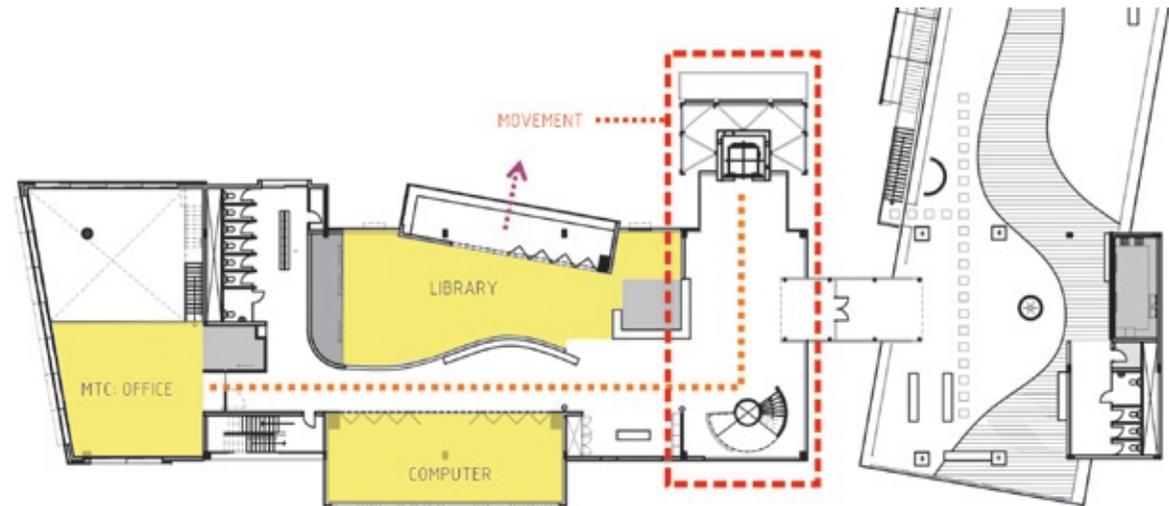
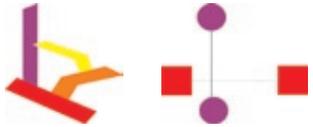


Fig 8.17: Fourth floor accommodation



The Factory Structure



The factory is a dynamic frame connecting the street with the market. It is an exhibition box elevated from the ground and supported on skew columns in order to give the impression that it is in motion. The factory cuts through the rigid box to view the street and the city. It is a curious spectator but ultimately the performer.

The frame of the factory is painted black while the supporting columns are painted red. Strong colours convey the strength of the structure. The ground floor beneath the factory is landscaped with benches in order to activate the space and bring focus to the factory.

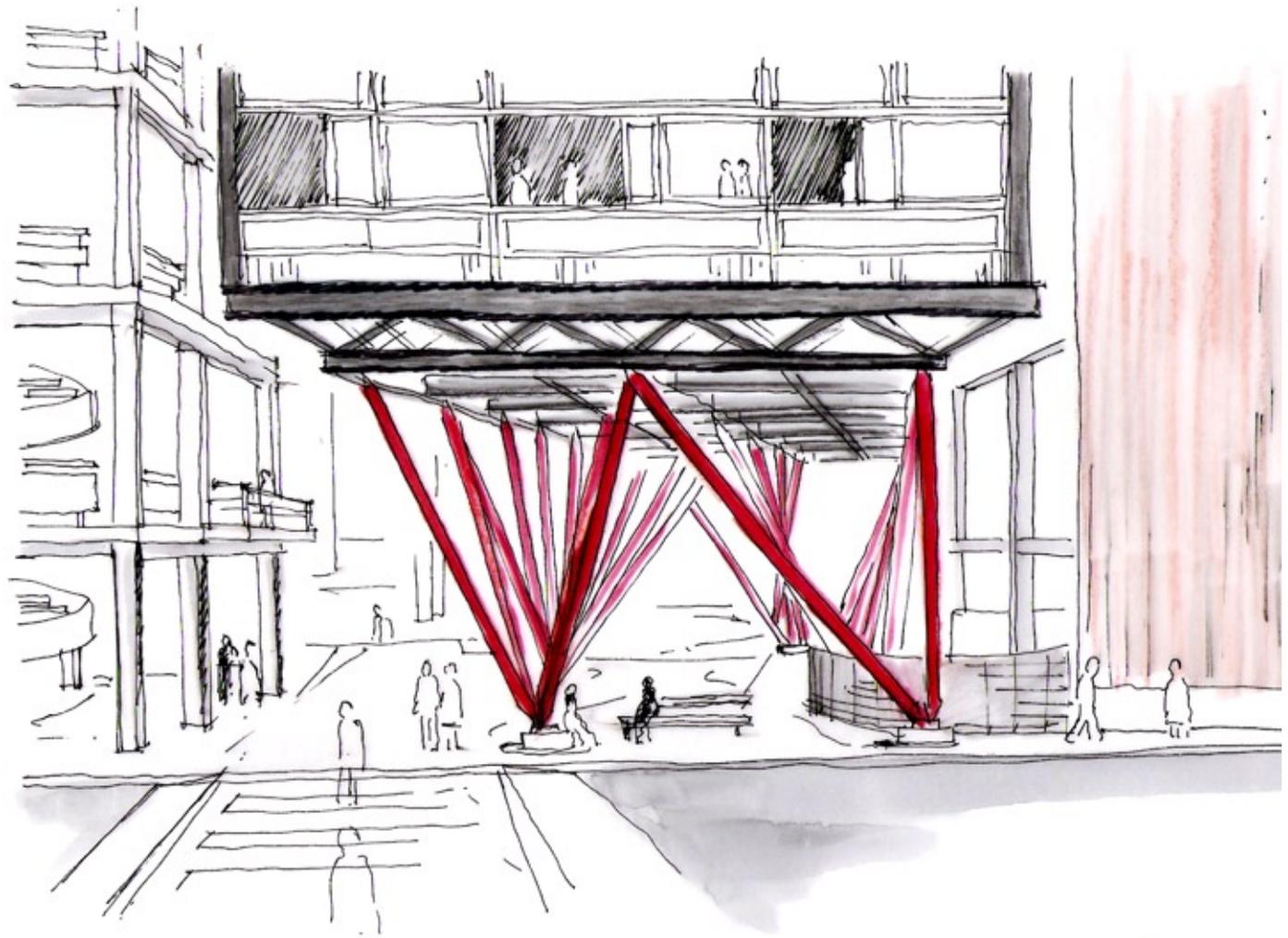


Fig 8.18: South elevation of factory

DESIGN IMPLEMENTATION

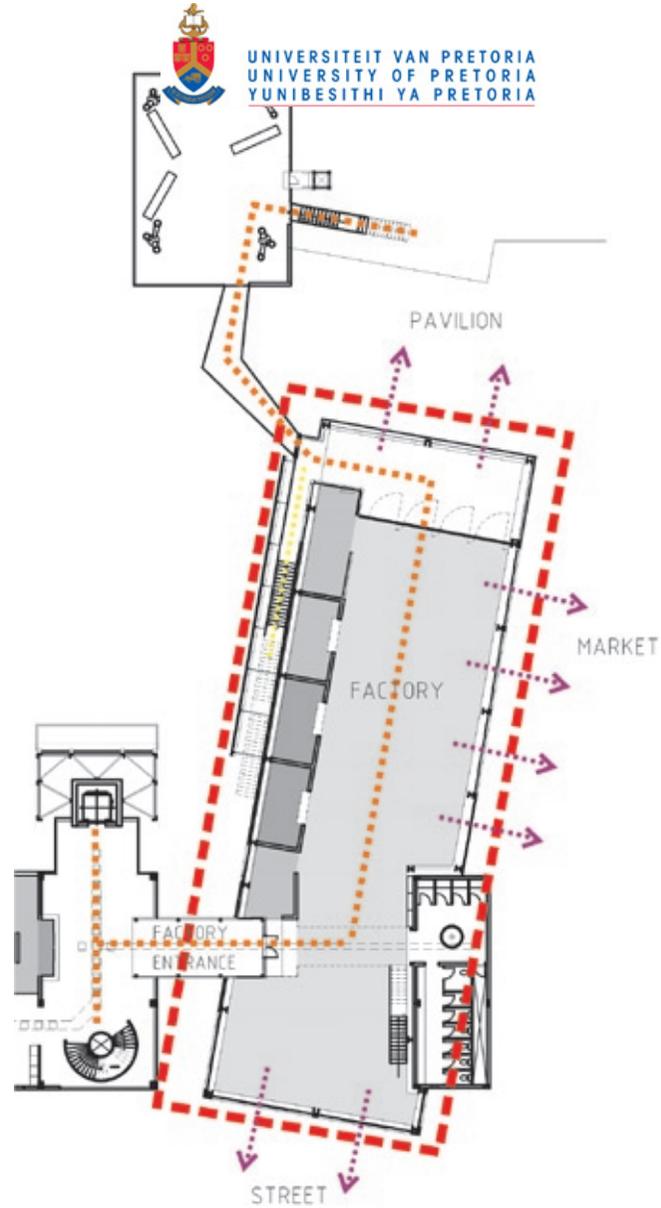


Fig 8.19: Second floor accommodation

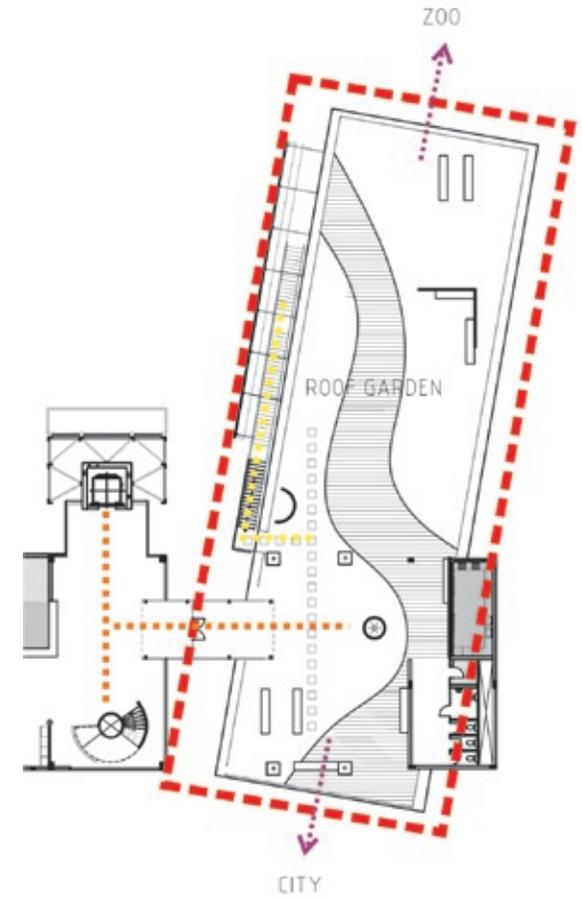


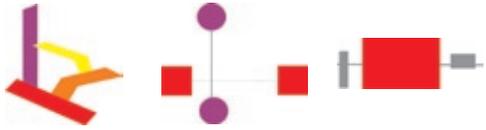
Fig 8.20: Fourth floor accommodation

The southern and eastern facade are clad in aluminium framed sliding glass ribbon windows in order to give a maximum degree of transparency into the factory activities. The western façade is screened and stairs run the length of it up to the factory roof. The stairs enhance the movement of the factory box. The northern façade opens up to the pavilion and can be accessed by a steel bridge. The factory therefore transcends its utilitarian function and becomes a exhibition space.

The roof of the factory is a public viewing platform. From the roof it is possible to have a northern view over the market and beyond the market into the Zoological Gardens. The southern view is of the buildings opposite Bloed Street and the city skyline.



The Open Pavilion



The open pavilion is adjacent to the pedestrian walkway which links Bloed Street Taxi Station with Belle Ombre Train and Taxi Station. The focus of the open pavilion is to provide services that can be used by people moving between these stations and people moving towards the city from these stations. The ground floor comprises cooking stations.

Food is an important factor when arriving in a city. The cooking stations and its patrons act as a valuable source of information for rural immigrants. It is a quick and effective tool for navigating the urban context. The open pavilion has two vertical movement points. The eastern point is a disabled ramp situated among fever arcadia trees. It is a slow moving and relaxing environment.

The western point is in the centre of the site underneath a water tower. The large spiral staircase disrupts the horizontal flow pattern to emphasise the connection between the horizontal and vertical movement. The water tower acts as the central focus point of the site. It is therefore the meeting point.

DESIGN IMPLEMENTATION

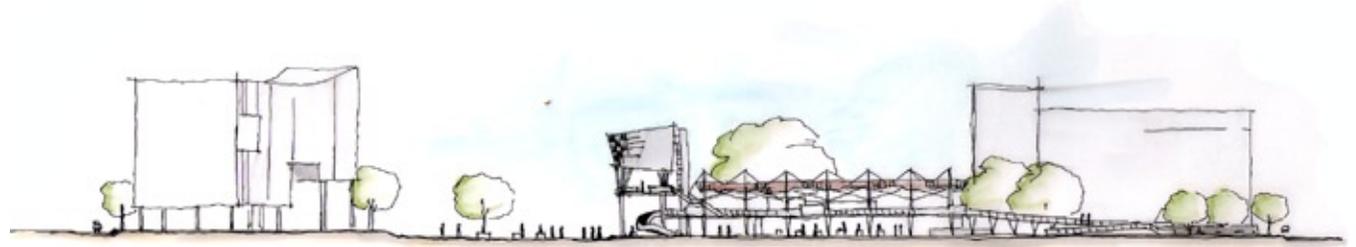


Fig 8.21: South elevation of open pavilion

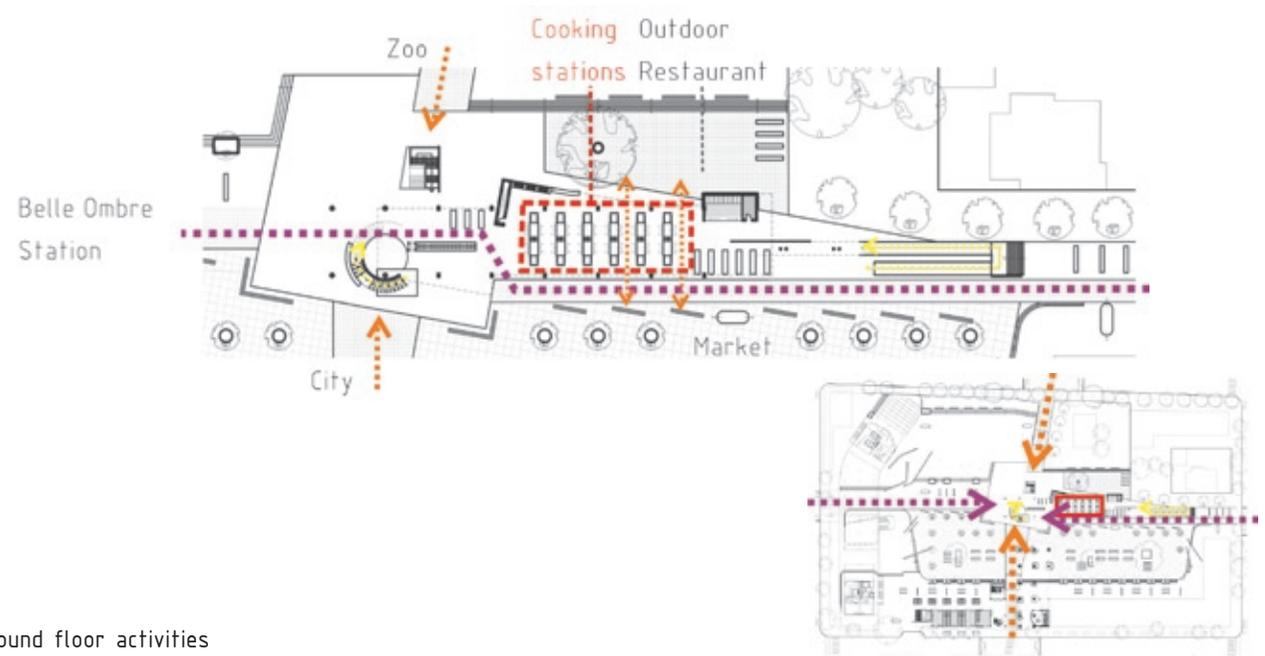


Fig 8.22: Ground floor activities

The first floor of the pavilion comprises ablution and public shower facilities. These are public facilities intended for arriving rural immigrants and informal traders. The pavilion is elevated from the ground to increase privacy, but it is ultimately open so as to be part of the market environment. The tensile roof structure is 4500mm from the floor level in order to increase the vertical space dimension. The coloured Plexiglas roof panels bask the shower facilities in variety of colours, giving it a vibrant atmosphere.

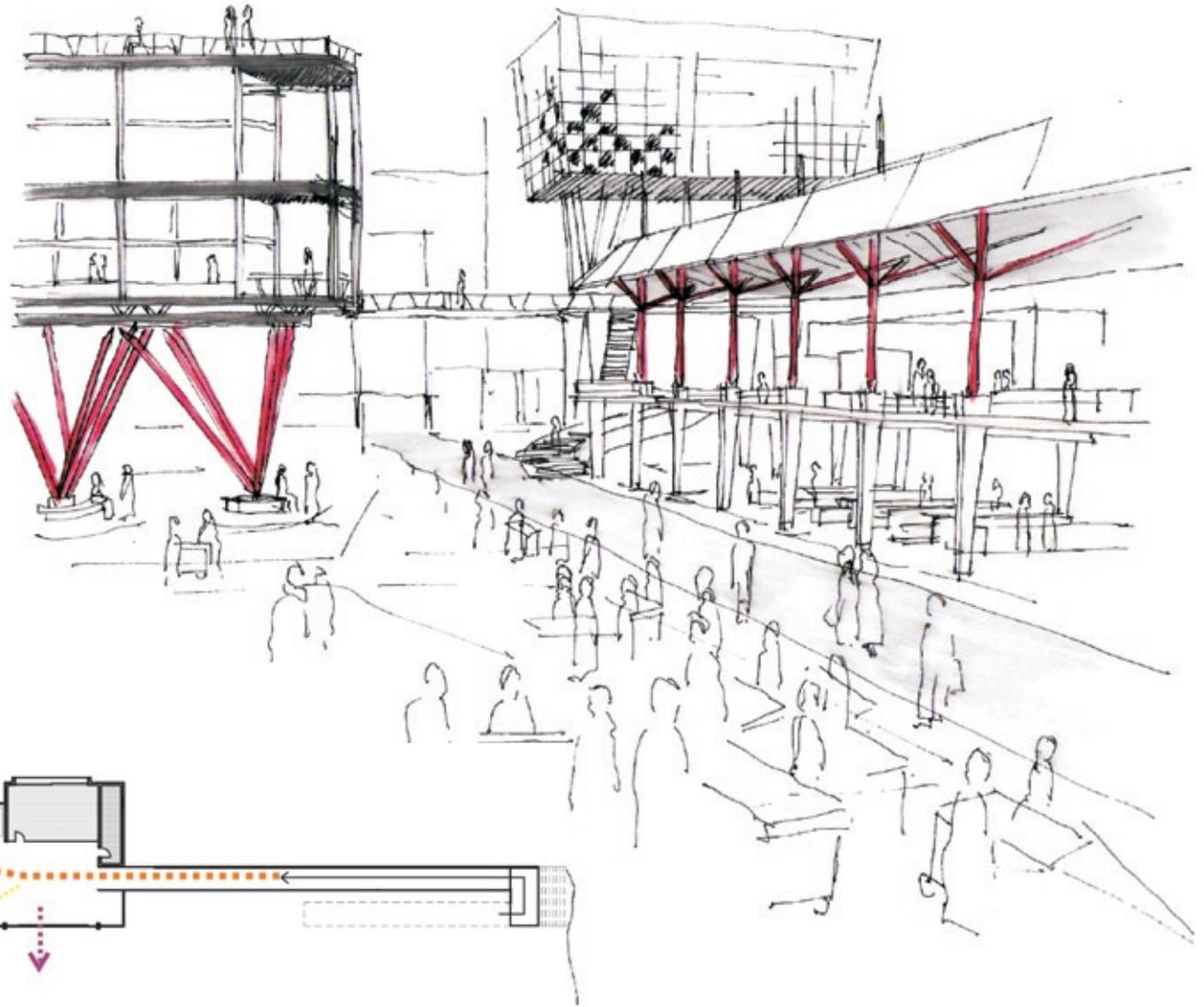


Fig 8.23: First floor of open pavilion

Fig 8.24: East perspective of open pavilion



The Water Tower



The water tower is the central orientation beacon of the site bounded by Paul Kruger, Boom, Andries and Bloed Streets. It is the meeting point, central to the site and on the intersection point between the market and the urban square.

The reinforced concrete tower is clad with black and white mosaic tiles in a 500x500mm square pattern. The dramatic effect of the black and white checkerboard pattern creates a visual attraction to the water tower.

The water tower intersects the east-west and the north-south pedestrian walkways. Water points are located on the ground floor underneath the tower. Apart from being an orientation beacon and a meeting point, the water tower stores a 6 month water supply for the public shower facilities in the open pavilion.

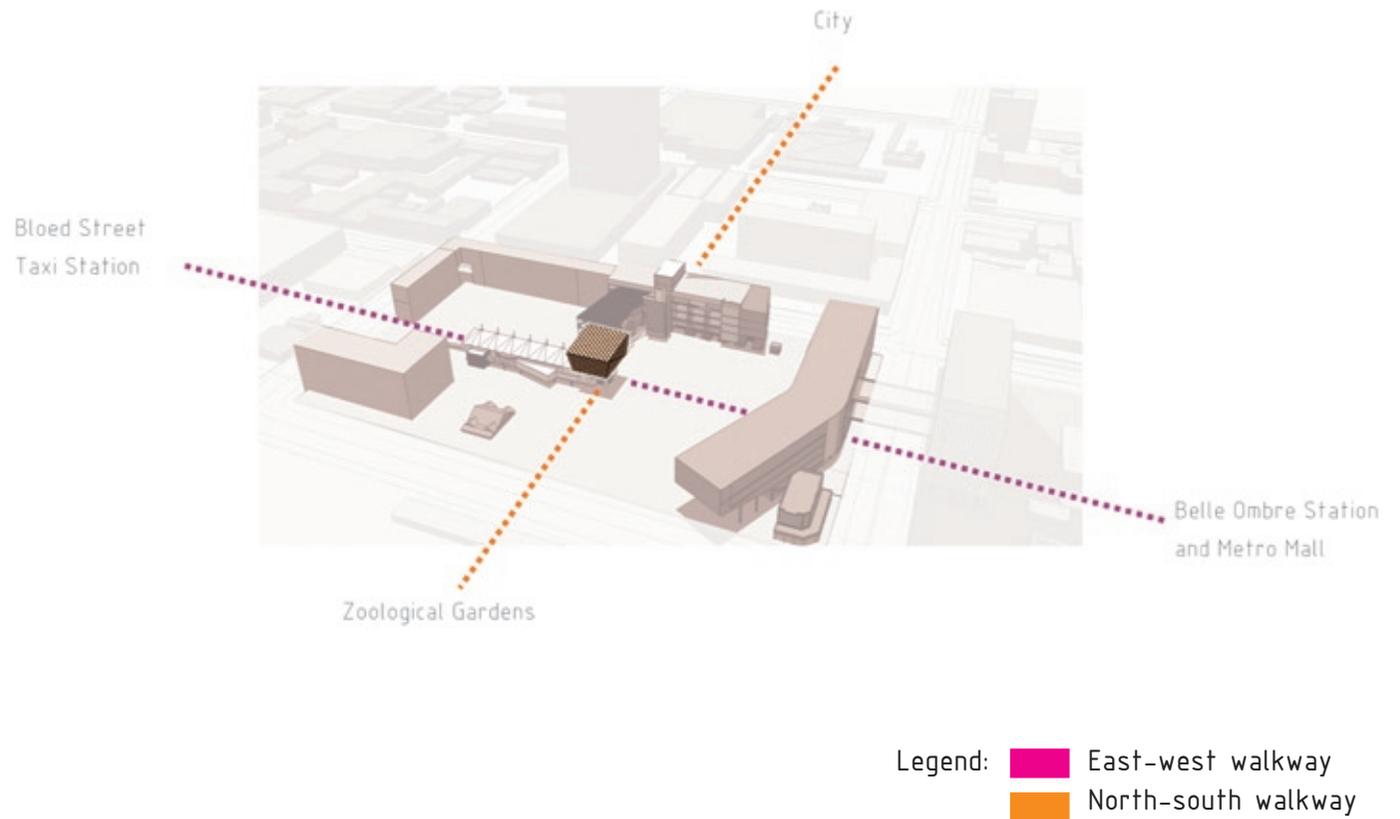


Fig 8.25: Water tower as meeting point

DESIGN IMPLEMENTATION



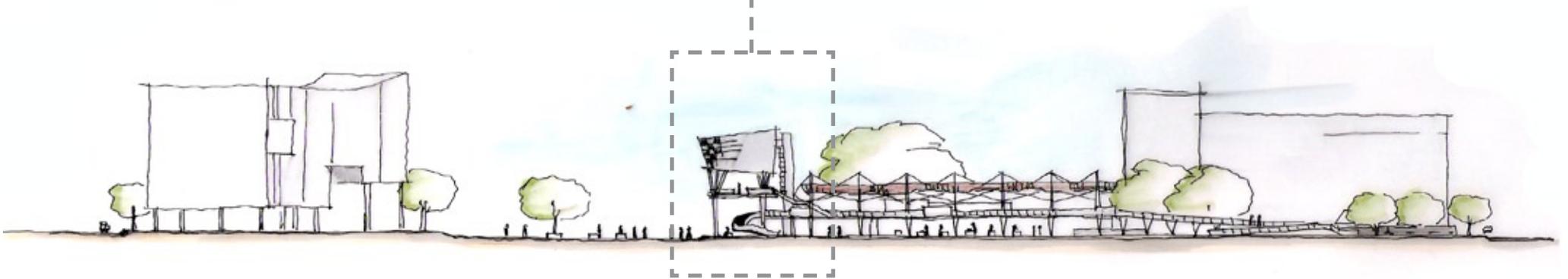
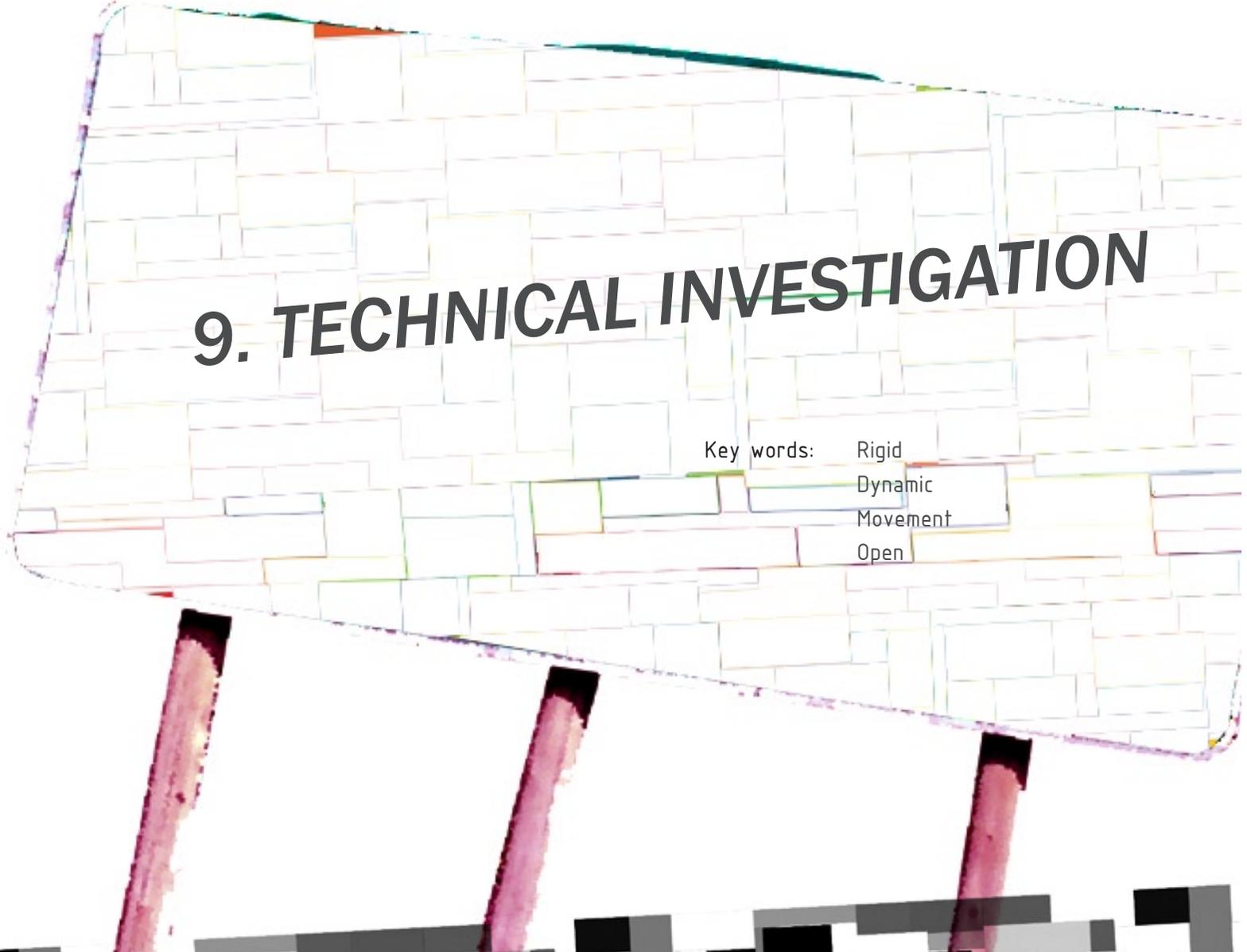


Fig 8.26: Water tower as beacon on site





9. TECHNICAL INVESTIGATION

Key words: Rigid
Dynamic
Movement
Open

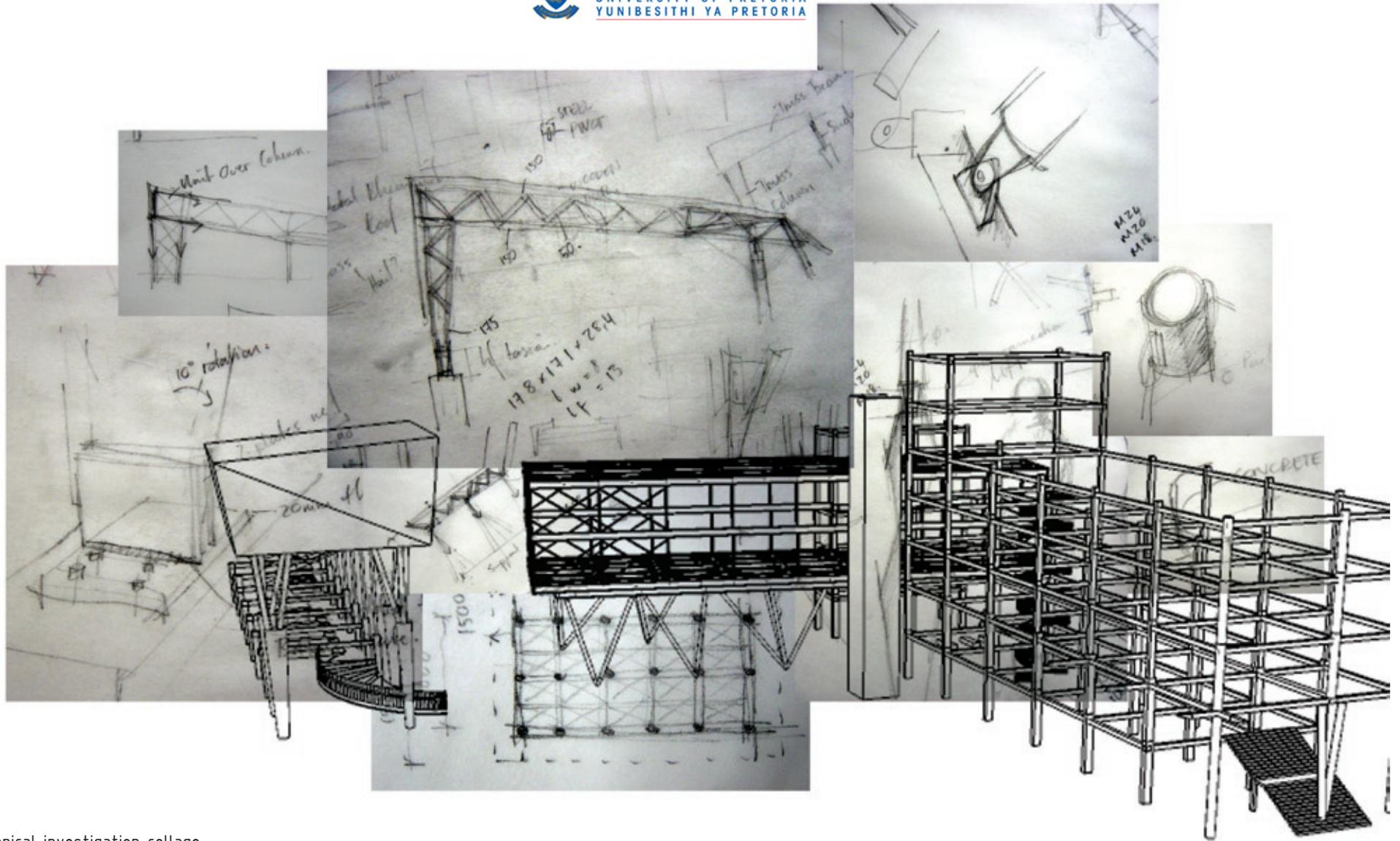


Fig 9.1: Technical investigation collage

Basement

Following the design principle that the ground floor be demarcated for public and economic use, parking and services are allocated to the basement. The entrance and exit ramps servicing the basement are located in Paul Kruger Street.

The ramps have water drainage systems at street level and at basement level. The basement is a cavity construction and therefore sumps are used to drain floor water to the water filter storage tank in the north-east corner (the lowest point in the basement). Due to the proximity of the site to the Apies River flowing through the Zoological Gardens, the basement is waterproofed with a 0.45mm polyolefin damp proof membrane and a perforated footing pipe 150mm in diameter is laid alongside the retaining wall footing.

The basement is ventilated using a combination of passive and mechanical devices. Intake air occurs in the centre line of the basement by means of floor openings provided by planter boxes. The air is then mechanically swept and extracted around the perimeter by twelve 10,000l/s m² fans. The air outlets are punctuated through ground level to form large steel features in the market and urban square.

TECHNICAL INVESTIGATION

The basement has a structural grid system of 8000mm in the east-west direction and 9000mm in the north-south direction. Cars park in the north-south direction. Columns are 700x300mm reinforced concrete with column heads designed by the engineer. The longer span is aligned in the north-south direction to maximize parking. The columns are recessed 500mm in the parking bay to ensure easy navigation into the parking bay by motorists.

Services such as the delivery area and the plant room are located in the basement in proximity to the security room for quality control purposes. The stairs and elevator are located adjacent to the security room for safety purposes.

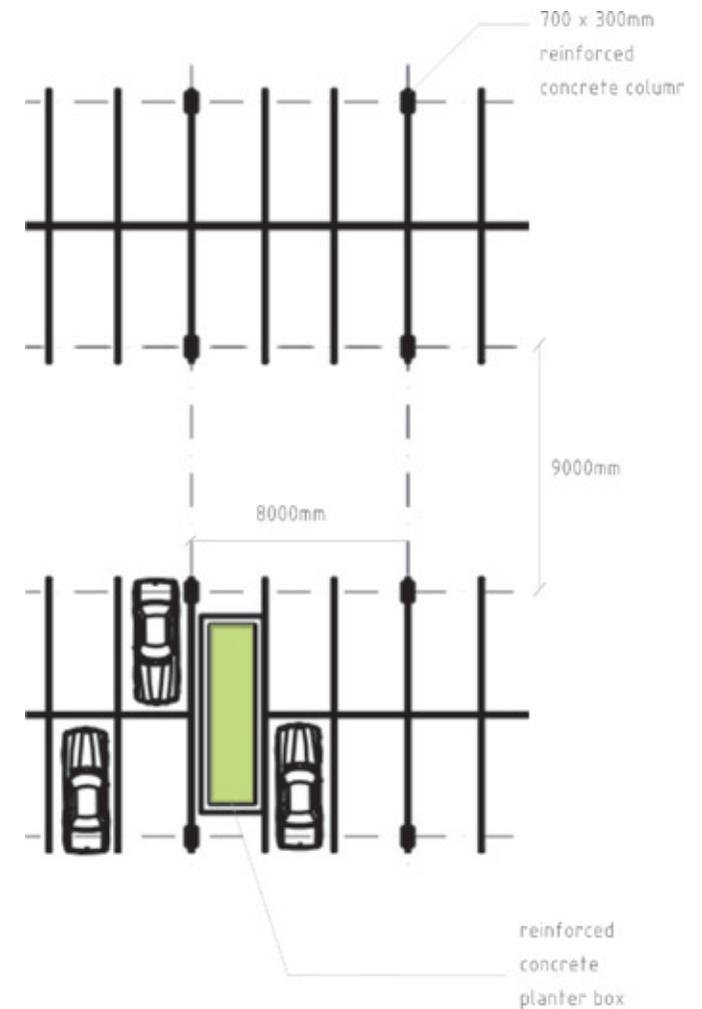


Fig 9.2: Basement parking

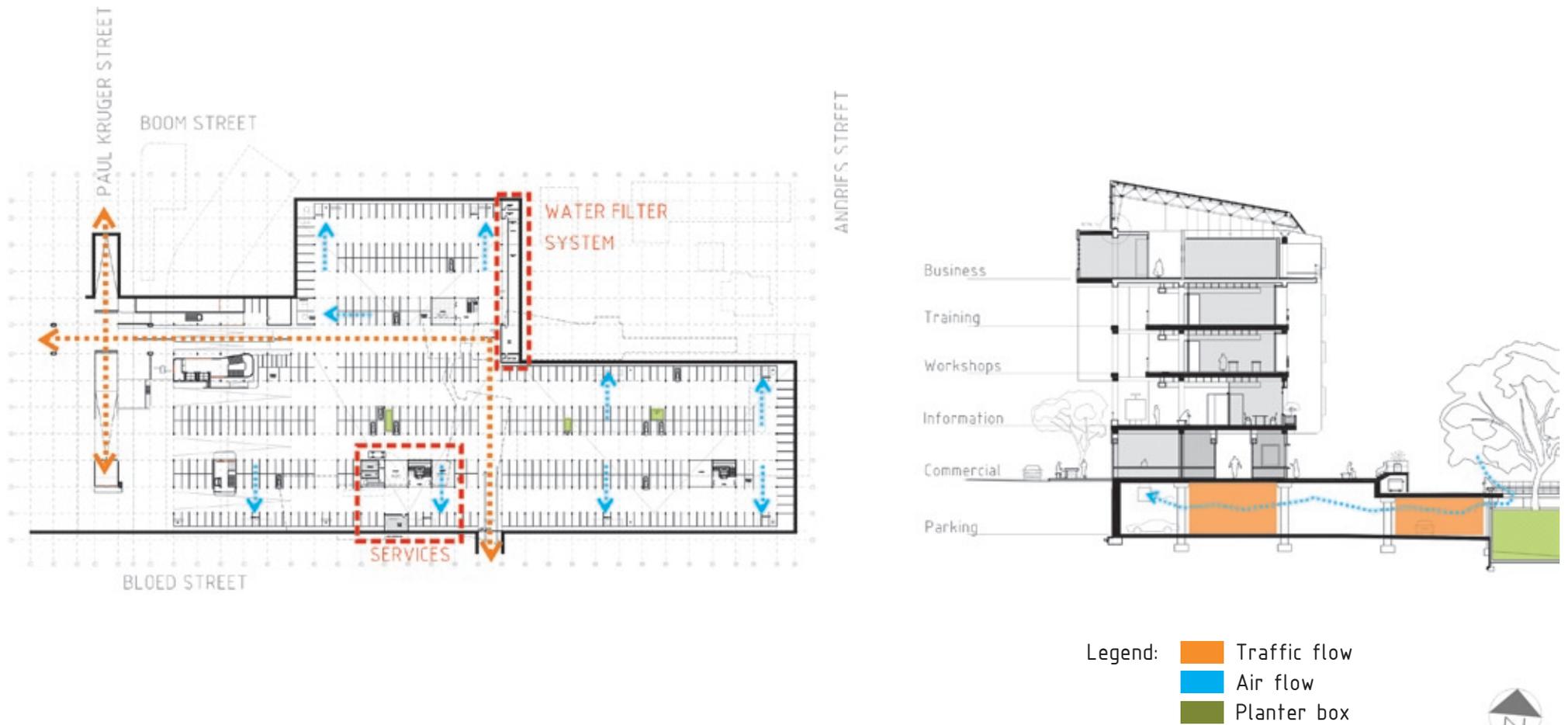


Fig 9.3: Basement plan and section



Rigid Box

Following the grid system through to the ground floor, it is clear that the construction of the building requires large spans. The grid system of the building is 8000mm in the east-west direction. In the north-south direction it is 6000mm from the street build to line to the first grid line, and 9000mm from the first grid line to the second grid line.

A reinforced concrete slab and two-way beam system is used for the construction of the rigid component adjacent to Bloed Street. Concrete is used to create a heavy permanent structure that indicates its permanence in the urban context. The dimensions of the columns, slab and beams are calculated relative to the required span distance, as in Table 9.1, 9.2 and 9.3 (Orten 1990:30-54).

The horizontal slab element is expressed over the vertical column element. This is done to emphasize the horizontal linearity of the structure. The vertical element is expressed by certain 'free' columns and by the spiral staircase in order to juxtapose the horizontal linearity.

TECHNICAL INVESTIGATION

Table 9.1: Column calculations

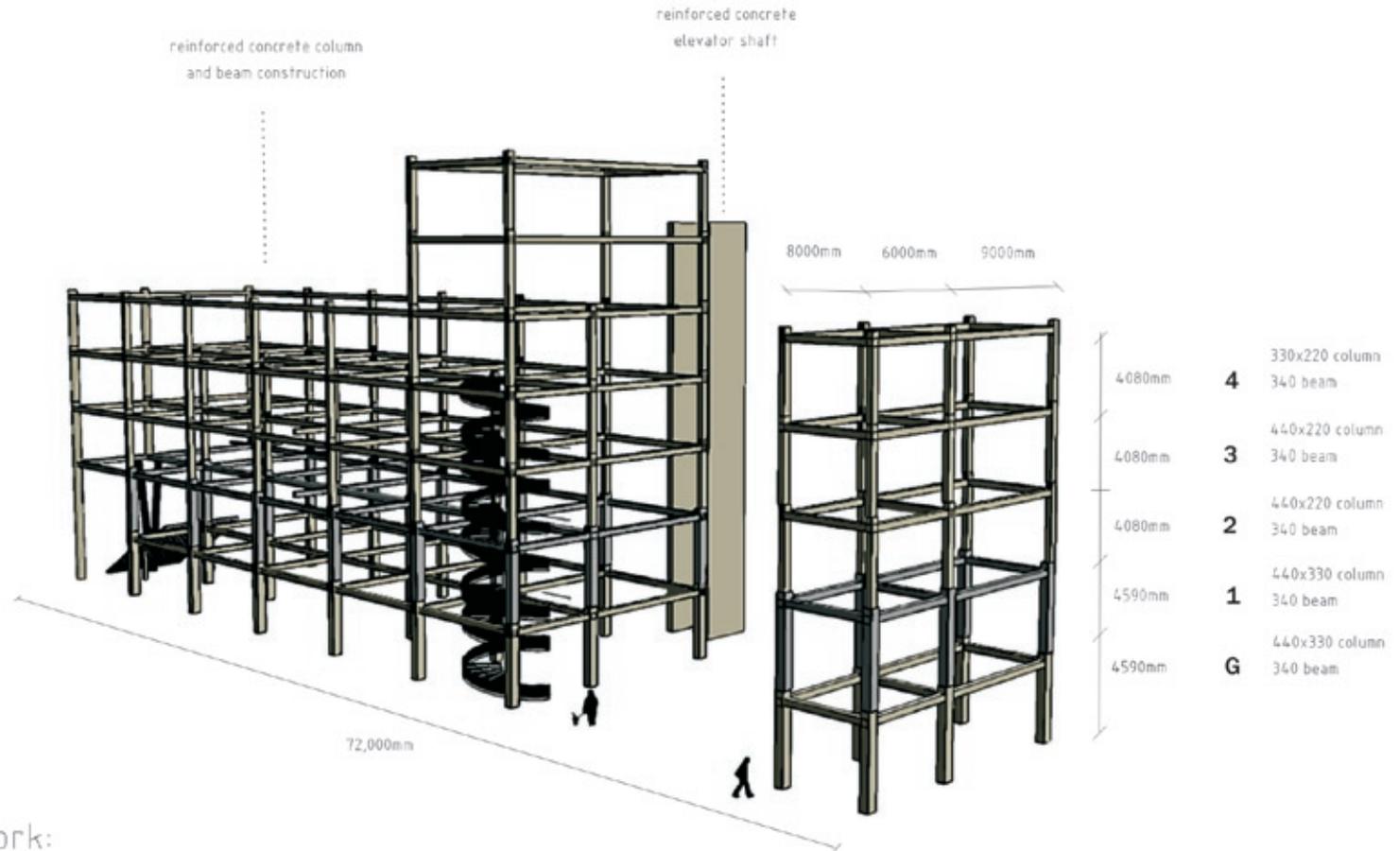
FLOOR	L/dmax	L/dmin	L/d (use)	SPAN (L) (mm)	DEPTH (d) (mm)	USE (mm)
Basement						
Wall	25	18	20	4590	226	330
Column	15	6	9	4590	510	700
Ground	15	6	12	4590	383	440
First	15	6	12	4590	383	440
Second	15	6	15	4080	272	330
Third	15	6	15	4080	272	330
Fourth	15	6	15	4080	272	330

Table 9.2: Slab calculations

SPAN (L) (mm)	L/dmax	L/dmin	L/d	DEPTH (d) (mm)	USE (mm)
9000	35	28	30	297	340
6000	35	28	33	184	340
8000	35	28	33	245	340

Table 9.3: Beam calculations

SPAN (L) (mm)	L/dmax	L/dmin	L/d	DEPTH (d) (mm)	USE (mm)
9000	35	28	30	297	330
6000	35	28	33	184	330
8000	35	28	33	245	330



Concrete work:

Use min 30MPa concrete. All columns and beams to have softboard lining in formwork to achieve attractive finish and eliminate blow-holes and imperfections. Min 30mm concrete cover over steel reinforcement in concrete columns and beams.

Fig 9.4: Perspective of Rigid Box structure



Floors are covered with a 50mm screed consisting of one part cement and two parts sand. The floors are then finished with 2mm Cemcrete® Floorcrete in conjunction with Flexbond as per manufacturer's specifications. Interior and exterior walls are plastered with 3mm Skimplaster® and covered with two coats of Glutone® paint as per specified colour.

Exterior materials are robust and hard, consisting mainly of steel, aluminium and concrete. Interior materials are softer and consist of inlaid red clay tiles and hardwood doors and frames. The materials play on each other to form a contrast that represents the difference between the hard city and the soft human.

Electrical services are located in 600 x 300mm steel mesh rectangular shafts. The steel mesh is framed with 25x25x3,0 steel cold formed equal angles at the corners. The frame are suspended from the concrete roof with 12 diameter solid steel rods. The steel rods are connected to the shaft frame with steel cleats and M8 bolts.

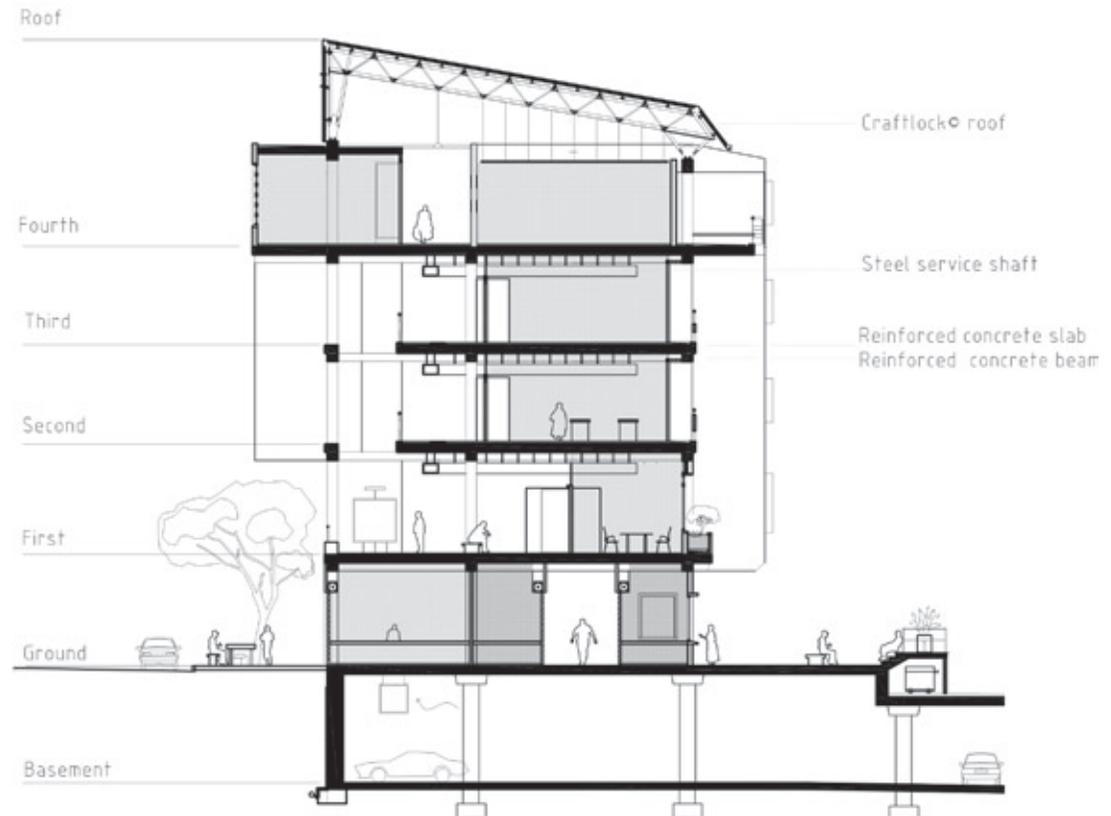


Fig 9.5: Section through rigid box

TECHNICAL INVESTIGATION

The encompassing Craftlock® roof is supported by a bolt-connected steel truss system. The dimensions of the truss system are summarized in Table 9.4 (Orten 1990: 30-54).

The top and bottom rafters of the truss system have to be separated by a distance of 980mm. The truss rafters are 127x146x22kg/m steel T-sections cut from I-section while the bracing is 50x50x5 equal angle steel profile. Purlins are 250x50x20x3 cold formed steel lipped channels connected to the rafter by 125x75x8 steel angle cleats. High tensile bolts of grade 6.8 and 8.8 are used to ensure the stability of the structure.

The value of the roof is that all components are able to be removed and re-used if necessary. If the building is to expand in a vertical direction, it is important that the roof be able to be disassembled and reassembled with the minimum effort and use of new materials.

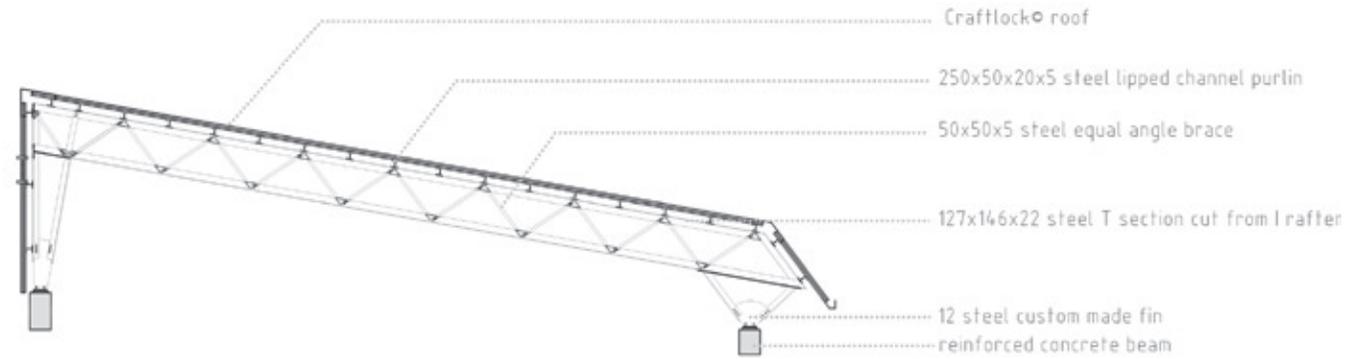


Fig 9.6: Roof truss structure

Table 9.4: Steel truss calculations

Element	SPAN (L) (mm)	L/dmax	L/dmin	L/d	DEPTH (d) (mm)	USE	PROFILE
Vertical	3500	25	20	22	162	127x146x22	T from I
Truss total	15000	18	10	15	978	980mm	
Truss element	3000	25	20	22	138	102x133x15	T from I
Bracing	1000	25	20	22	46	50x50x5	Equal angle
Purlins	8000	35	25	32	250	250x50x20x3	Lipped channel

Factory

The factory is a dynamic box rotated 10° east from the north south axis of the grid. It is a steel framed rectangular box supported by circular steel columns. All steel is to be painted with two coats of zinc phosphate primer and two coats intumescent paint in order to comply with SABS 1319 before entering the site. The dimensions of the steel components are summarized in Table 9.5 (Orten 1990: 30-54).

The steel columns are made off site. They consist of 324x8 hollow circular profiles, of various lengths but with an average length of 5500mm. Welded to the ends of the columns are 10° tapered hollow steel cones with a length of 600mm. All columns are numbered during the manufacturing phase to ensure the correct placement upon construction.

The columns are welded to 12 thick steel endplates and bolted with grade 8.8 bolts to the factory truss support at the top and the fin support at the bottom. The top connections of the columns follow the structural grid of the factory, while the bottom connections follow the structural grid of the basement. The difference causes the columns to take a dynamic stance between the horizontal and vertical vectors.

TECHNICAL INVESTIGATION

Table 9.5: Factory calculations

COMPONENT	L/d _{max}	L/d _{min}	L/d	SPAN (L) (mm)	DEPTH (d) (mm)	USE (mm)	PROFILE
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Support Column

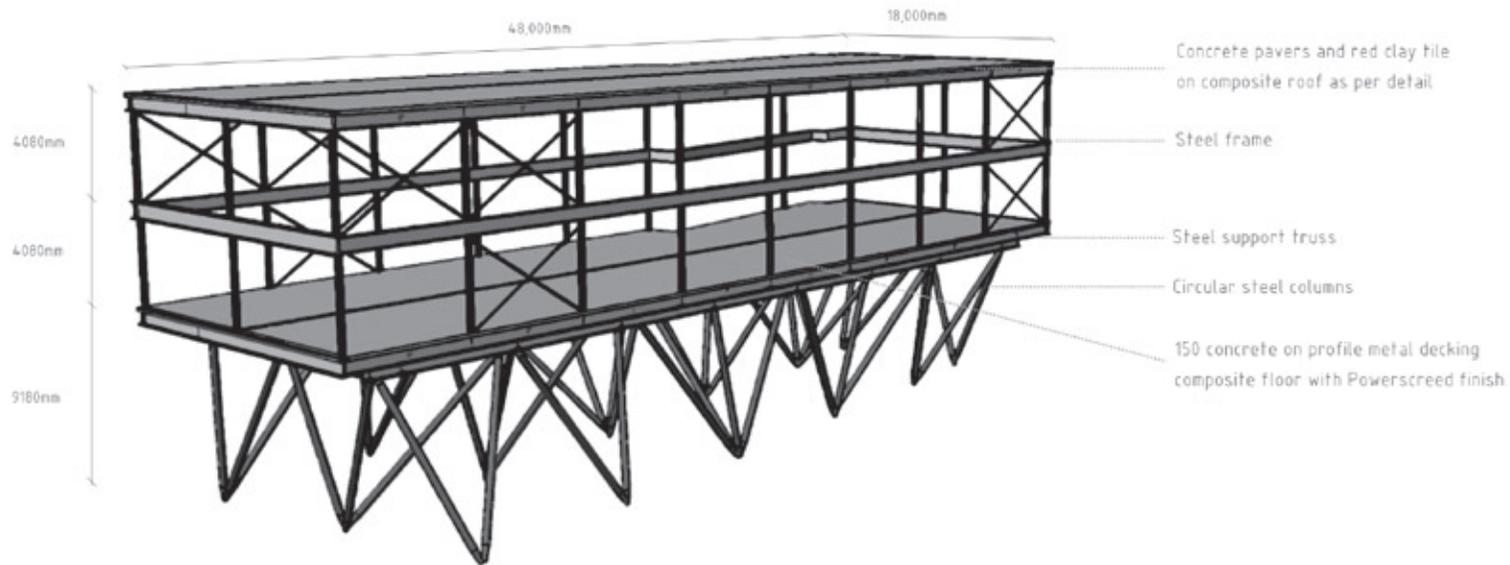
Vertical	35	20	20	5500	275	300	Circular
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Factory Box

Vertical	25	20	23	4080	175	203x203x60	H-section
V Brace	35	25	30	1500	50	80x80x8	Equal angle
NS Beam	25	20	20	6000	300	305x305x137	H-section
EW Beam	25	20	25	3000	120	152x152x30	H-section
H Brace	35	25	30	3000	100	101x20x23	T cut from H
Floor				3000		385x41x0.6	Metal sheet

Truss support

Truss total	12000	18	10	10	1200	1200	
NS Beam	25	20	20	6000	300	305x305x137	H-section
EW Beam	25	20	25	3000	120	203x203x60	H-section
H Brace	35	25	30	3000	100	101x20x23	T cut from H



Steelworks:

All steel is to be painted with two coats zinc phosphate primer to comply with SABS 1319 before entering the site.

Structural steel is to be further painted with two coats intumescent paint to have fire resistance of minimum two hours.

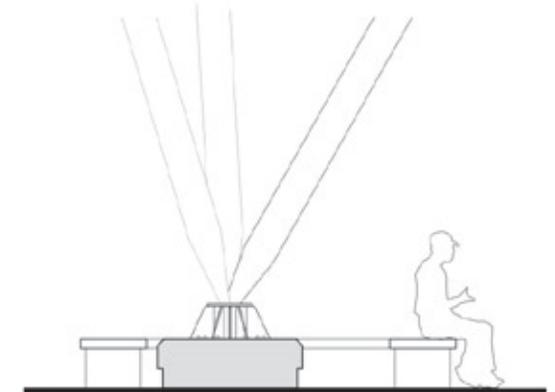
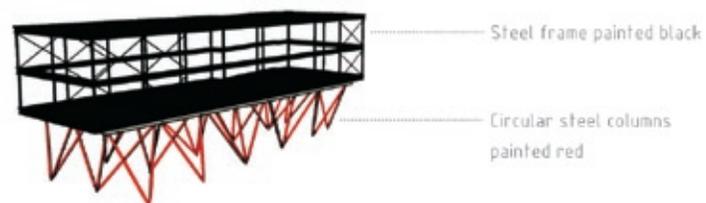


Fig 9.7: Perspective of factory frame with column foot detail



The truss support system conveys the dead and live loads from the factory to the vertical support columns. The truss has a vertical depth of 1200mm. The bottom rafter of the truss connects to the column support, while the top rafter of the truss forms the factory floor. The depth of the truss creates the illusion that the factory is floating above the support columns and therefore free from the urban context.

The bottom rafters of the truss in the north south direction are 305x305x137 steel H-sections. The east-west rafters are 203x203x60kg/m steel H-sections. Steel fins are placed at the connection points to prevent shear failure of the web. The east-west rafter is welded to a 125x75x8 steel angle cleat and bolted with high tensile bolts of grade 8.8 to the north south rafter. The top and bottom rafters are braced with 101x20x23 T-sections cut from H-sections. The brace beams are bolted to 10mm thick steel gussets, which are welded to the rafters. The gussets are custom made to have an elegant appearance and to follow the line of the brace beams.

The factory box has a structural grid of 6000mm in the north-south direction and 3000mm in the east-west direction. The north-south rafters are 305x305x137 steel H-sections and the east-west rafters are 152x152x30 steel H-sections. The east-west rafters are welded to 125x75x8 steel angle cleats and bolted with high tensile bolts of grade 8.8 to the north south rafters.

Additional support is provided in the north-south direction using 101x20x23 T-sections cut from H-sections. This allows the composite deck floor to become part of the bracing system, stabilizing the floor structure.

The composite floor consists of 150mm concrete cover over 385x41x0.6 ribbed metal floor sheet welded with shear metal studs to the east west rafter. A 50mm screed is used to cover the composite floor and finished with 15mm Powerscreed© to ensure that the factory has a durable, long-lasting low maintenance surface. The vibration of the floor due to the machinery is compensated for by using 25mm thick neoprene rubber between the steel and the concrete.

The east and south façades of the factory consist of aluminium framed sliding glass rectangular windows. The horizontal dimension of the windows is longer than the vertical dimension in order to emphasize the horizontal linearity of the structure. The use of sliding windows allows communication between the outside and the inside.

The factory can communicate with the street and with the market. The north façade opens up to an open foyer with aluminium framed glass pivot doors. The west façade is screened by using craft lock cladding. Steel stairs run along the western façade of the factory leading from the second floor level to the roof garden. Rectangular woven wire mesh screens the stairs from the harsh west sun and wraps around the bottom of the factory truss support to prevent birds from nesting in the steel truss system.



Fig 9.9: Plan of steel floor frame



Fig 9.10: Plan of steel truss frame

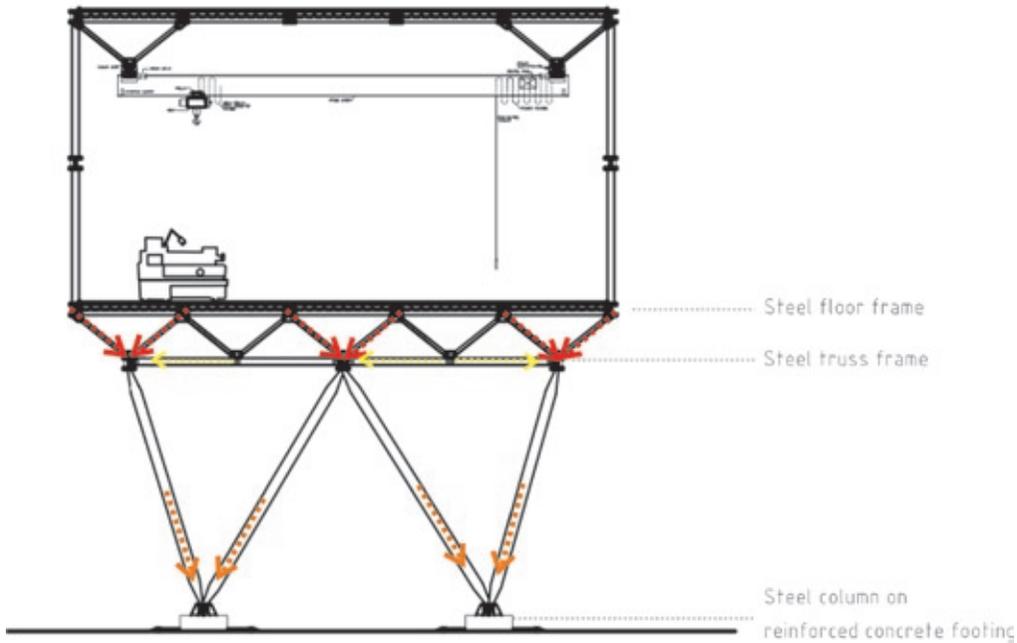


Fig 9.8: Section through factory structure



White bridge box

A steel plated metal box painted white forms a bridge between the rigid box and the factory. The metal box is supported by 152x152x30 steel H-section rafters and spans from the rigid concrete structure to the north-south rafter of the factory.

The steel box is vertically supported using 100x100x5 steel hollow square sections at 3000mm centre. On the second floor, the metal box is the entrance to the factory from the rigid concrete structure. On the third floor, it functions as a boardroom overlooking the factory, and connected to the factory management office with a steel bridge spanning over the factory floor.

The boardroom is sound insulated using 50mm fiberglass between the metal sheet and the hardwood interior panels. On the fourth floor, it functions as a bridge between the roof garden and the rigid concrete structure.

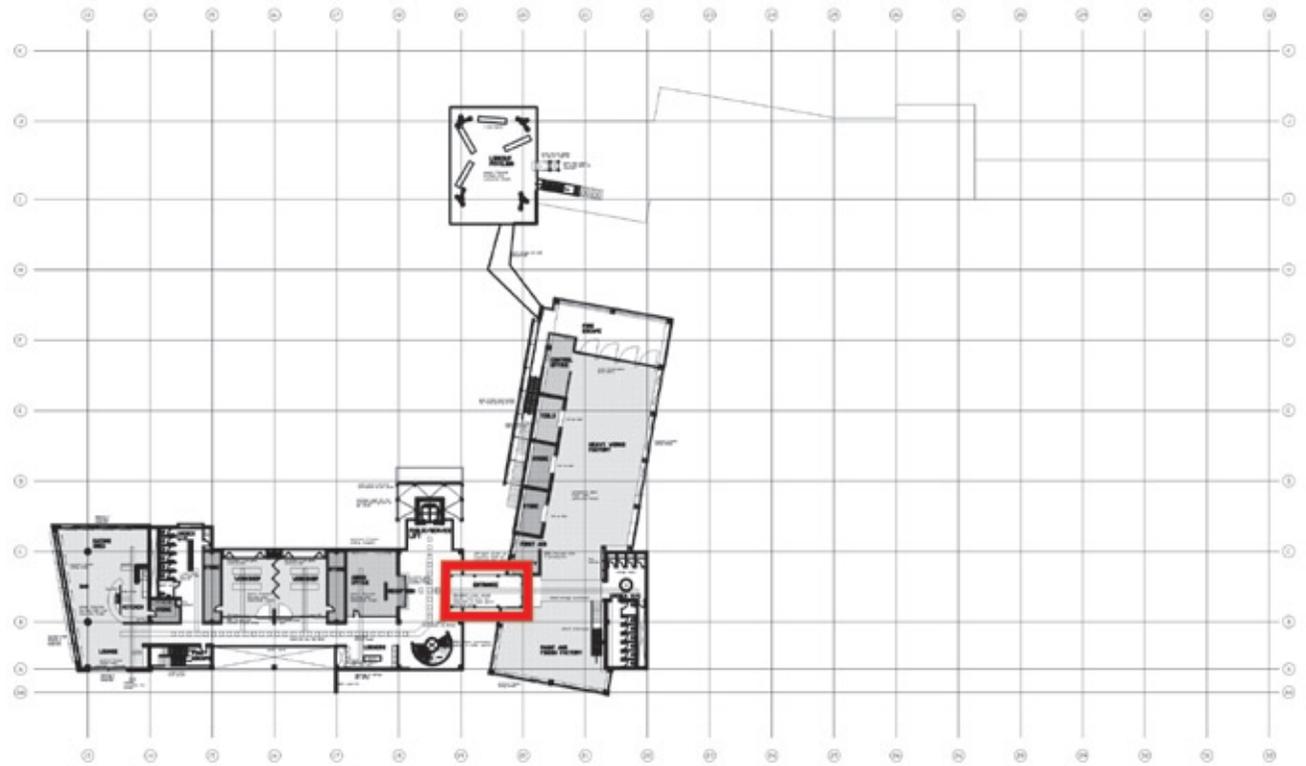


Fig 9.11: Bridge box on second floor plan

TECHNICAL INVESTIGATION

The Open Pavilion

The open pavilion is a culmination of the contrast between hard and soft, permanent and ephemeral. The pavilion is anchored to the ground level with robust off-shutter reinforced concrete columns following the grid pattern of the basement.

The roof is clad with acrylic Plexiglas Satinice® panels of various colours. The panels allow between 50 and 75% light transmission depending on the colour used. The velvet texture combined with the different colours gives the pavilion a colourful yet soft atmosphere.

Above the public shower facility, the roof is clad with Solardome® water heating panels. Water comes from the central reservoir to the Solardome® panels with a 150mm diameter uPVC pipe. The water is heated in the Solardome® panels and then stored in the geysers in the service shafts.

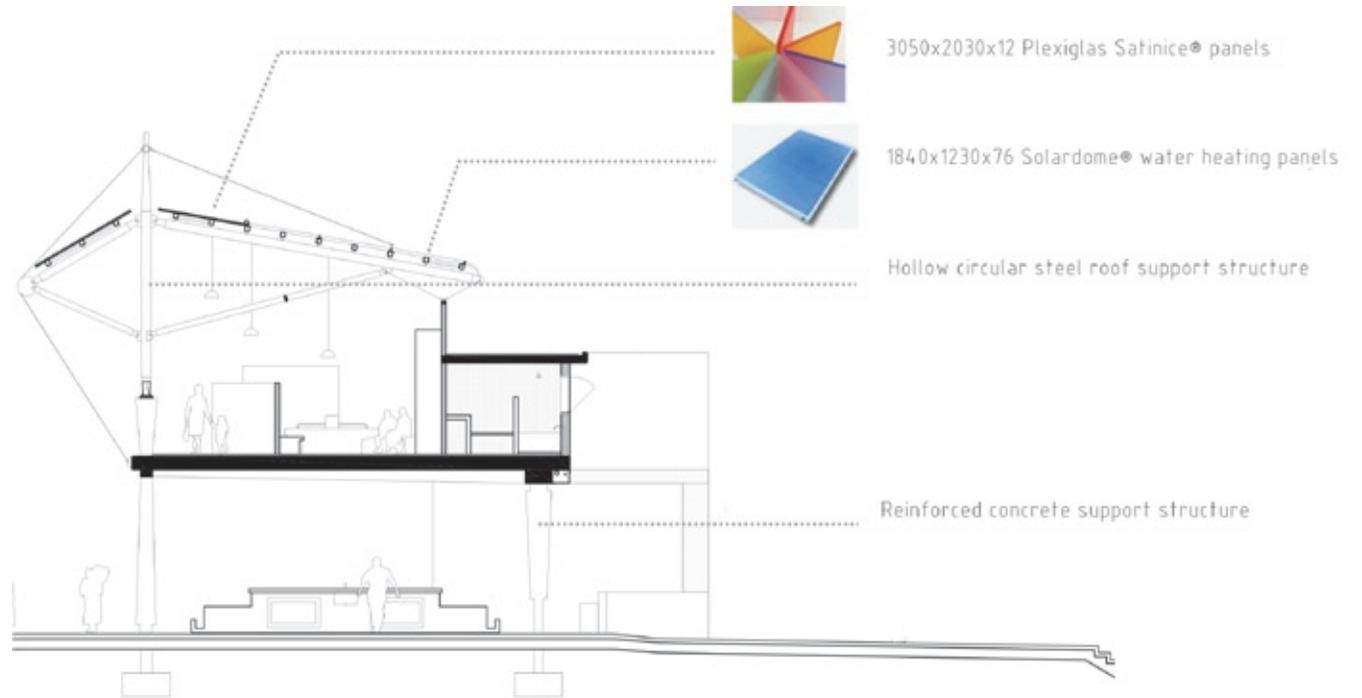


Fig 9.12: Section through open pavilion



The roof structure is supported by 276x6 hollow circular steel columns welded to 12 endplates and bolted to the concrete columns. Perpendicular rafters of 219x4,5 hollow circular steel profiles are pin-connected to the column with 10 custom made steel fins and high tensile bolts. The brace beams are 178x4,5 hollow circular steel profiles and rotated 45 degrees from the column. The brace beams are pin-connect to the rafters with 10 custom made steel fins and high tensile bolts.

The steel columns extend beyond the roof line in order to connect with the 6 wire tensile cable. The tensile cable is taken around a custom made steel disc with a groove and connected to the concrete floor slab in order to ensure structural stability of the roof.

The circular steel profile roof structure of the open pavilion communicates with the circular steel columns of the factory frame. The columns of the roof structure is painted red to enhance the perceived strength of the structure. The remaining elements (rafters, bracing and purlins) are painted black.

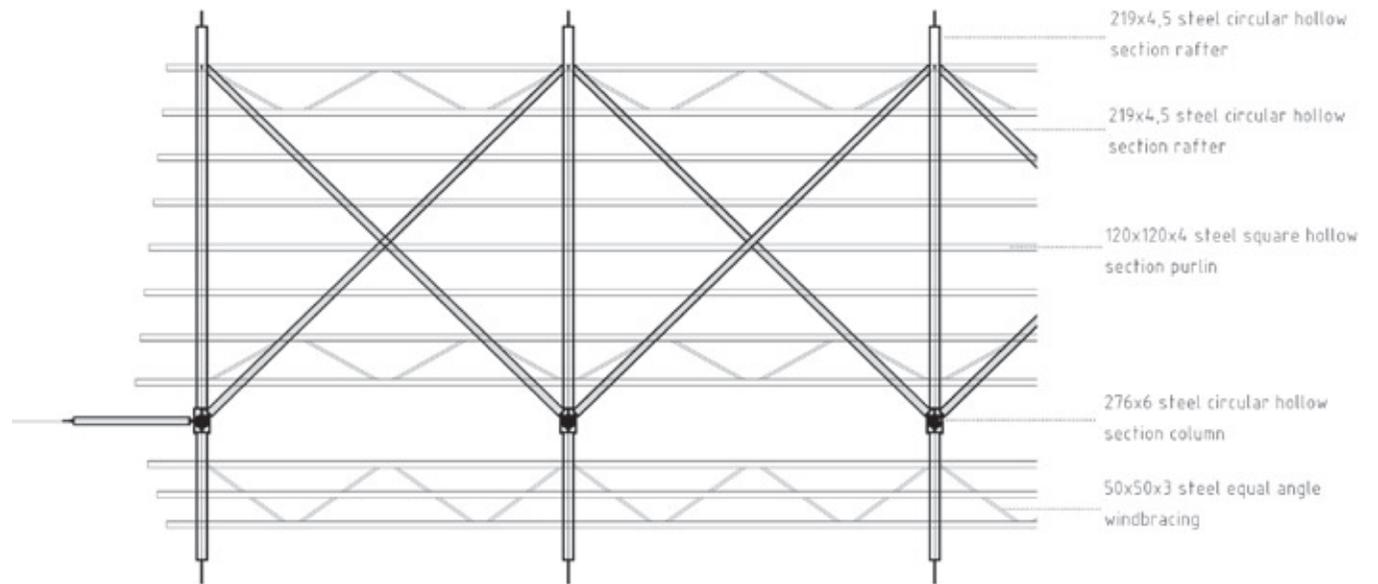


Fig 9.13: Plan of roof structure

TECHNICAL INVESTIGATION

Site water use

The 30-year average rainfall in the Pretoria CBD region is 674mm according to the South African Weather Agency (South African Weather Service 2007). The effective ground floor area of the market and urban square is 15,840m². Thus, on average, 10,690m³ rainwater is lost into the municipal storm water drains from the site every year.

The hard concrete and tile surface of the market and urban square allows the rainwater to be channelled to cast iron storm water drains. The 150mm diameter uPVC drain pipes are connected to the 180m³ water storage tank in the basement. From the basement tank, the water is naturally filtered through sand, gravel and rock layers and mechanically pumped into the water reservoir in the centre of the site. The water reservoir stores 720m³ water.

The reinforced concrete water reservoir has the capacity to store the water demand of the open pavilion for 6 months, as calculated in Table 9.6 and 9.7. The remainder of the water supply from the reservoir is used to clean the market and urban square and to irrigate the flora.

Table 9.6: Water storage

Activity	Consumption dm ³ (liter)	Description	Number (units)	Usage p/day	Demand (day) m ³	Demand (6 month) m ³
Shower	36	4minutes/person	11	6	2.38	434
Basin	3	handwash	18	4	0.22	39
Cook basin	5	dish wash	8	4	0.16	29
Toilet	9	per flush	9	8	0.65	118
Total					3.40	621

Table 9.7: Water demand

Acticity	Supply m ³	Demand m ³	% of Supply
Reservoir	720		
Basement	180		
Total	900		
Shower use		434	48
Basin		39	4
Cook basin		29	3
Toilet		118	13
Total			69



Average annual rainfall : 6
Site area : 15,840m²
Water volume : 7,485m³

Site drain : cast iron grid
150 diameter uPVC pipe
to south edge (lowest on site)

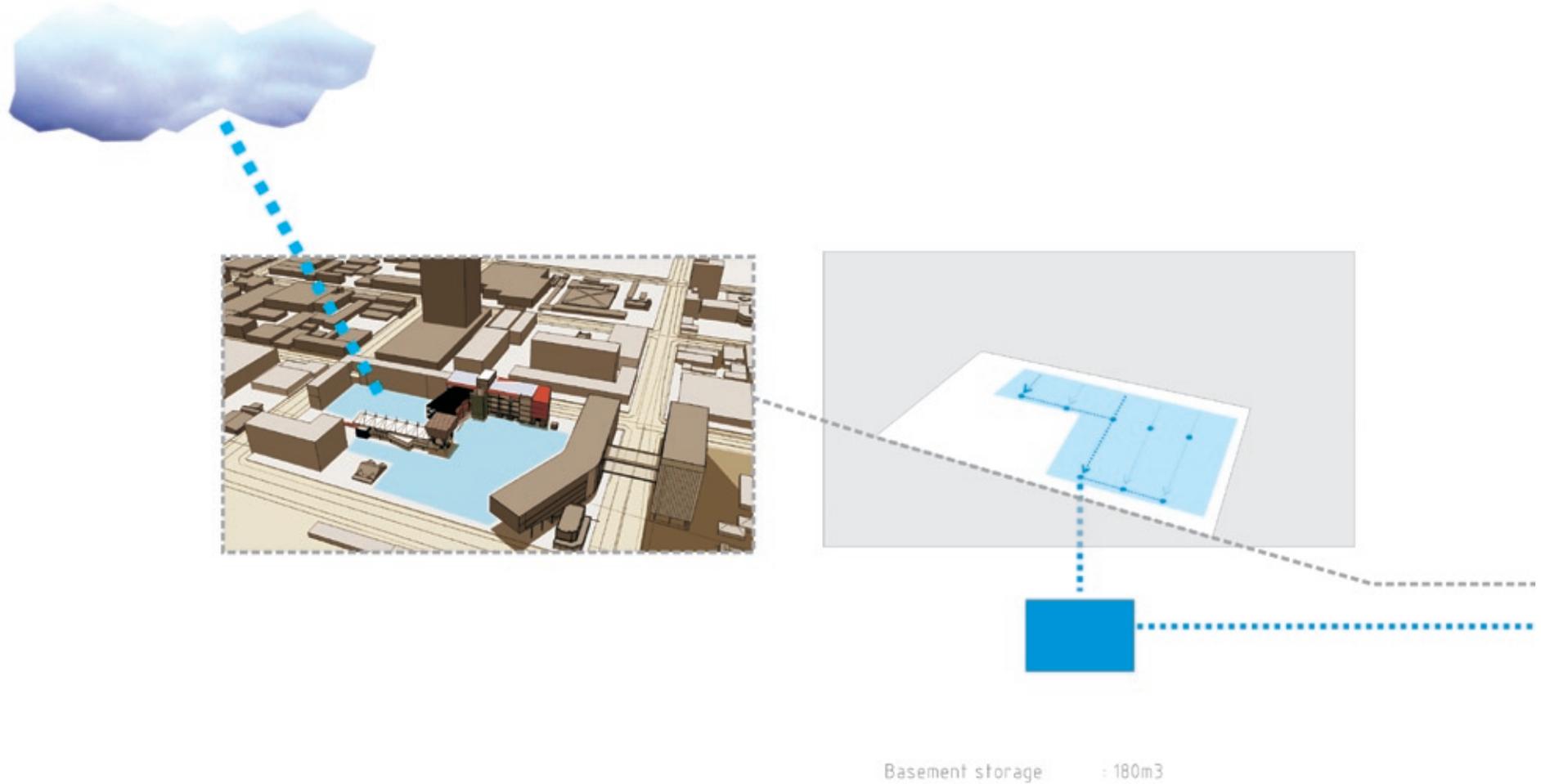


Fig 9.14: Diagram of site water use

TECHNICAL INVESTIGATION

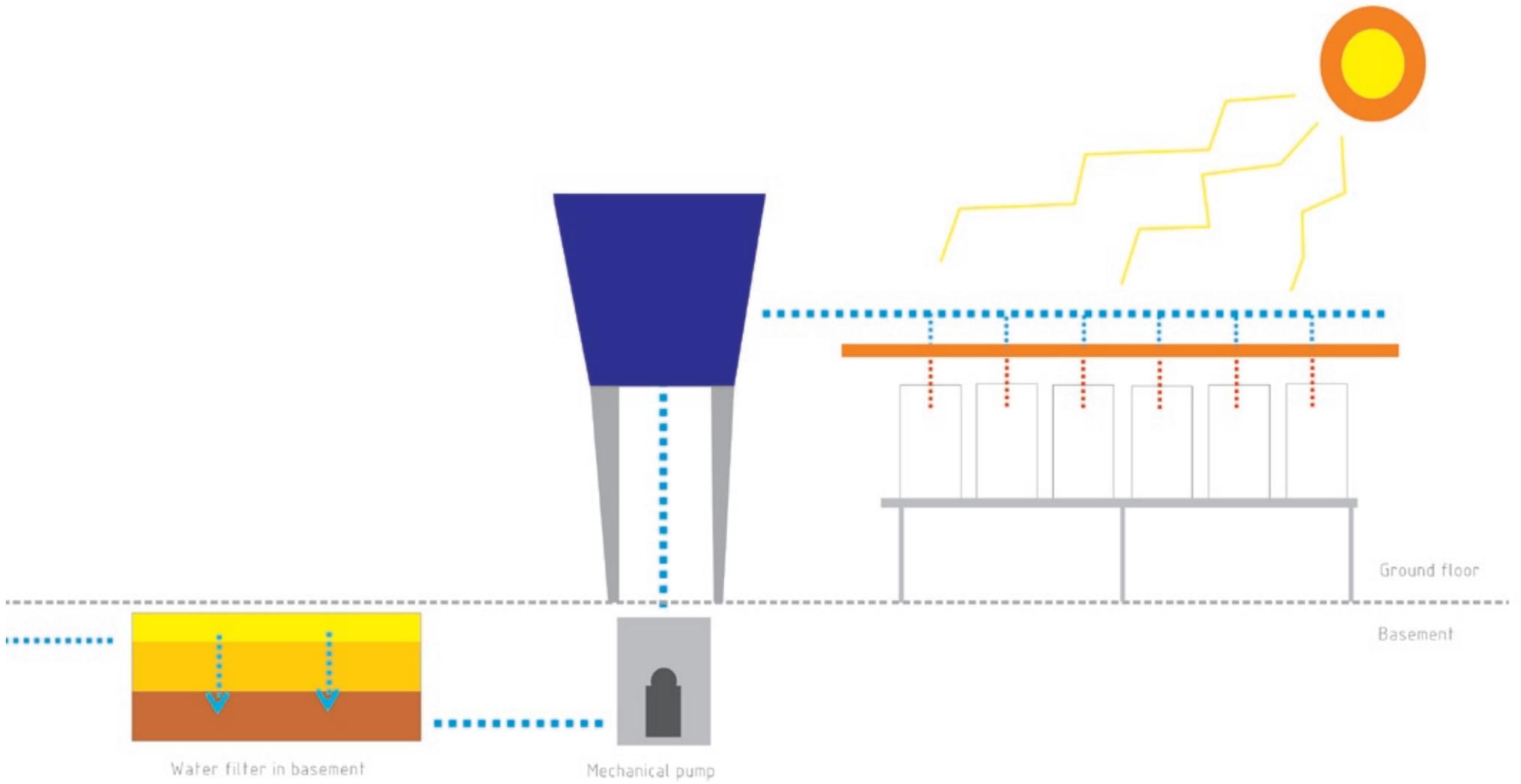


Site reservoir : 720m³

reinforced concrete

shower : 450m³ demand

Solardome® water heater



Solar Design

The water tower acts as a solar clock in the market area. The shadow line extends deep into the market during the late afternoons.

The solar penetration is controlled by the use of overhangs on the northern facade. This limits the solar penetration in the summer and allows maximum solar penetration in the winter.

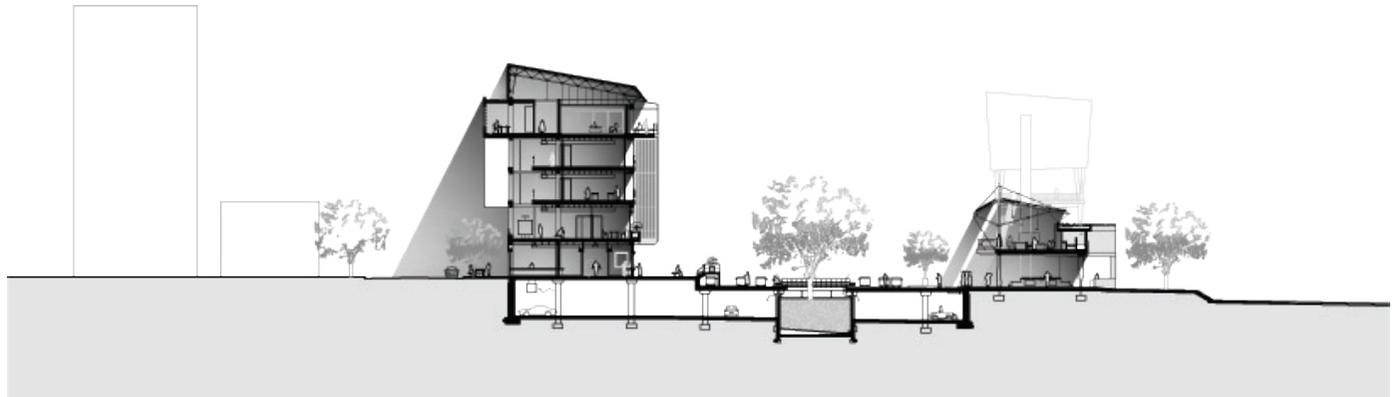


Fig 9.15: Solar penetration, 21 December at 10h00



Fig 9.16: 21 December, 10h00



Fig 9.17: 21 December, 14h00



Fig 9.18: 21 December, 16h00

TECHNICAL INVESTIGATION



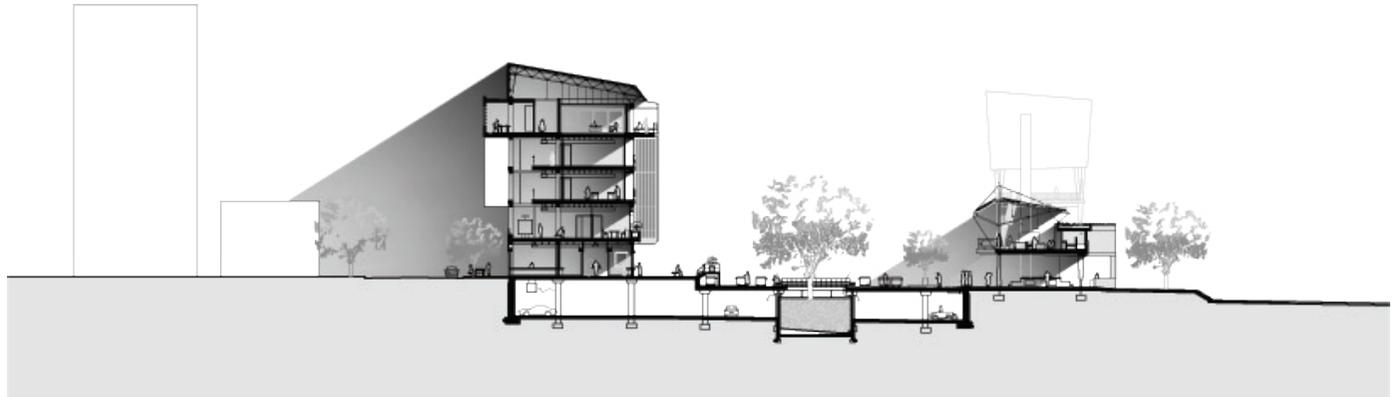


Fig 9.19: Solar penetration, 21 June at 10h00

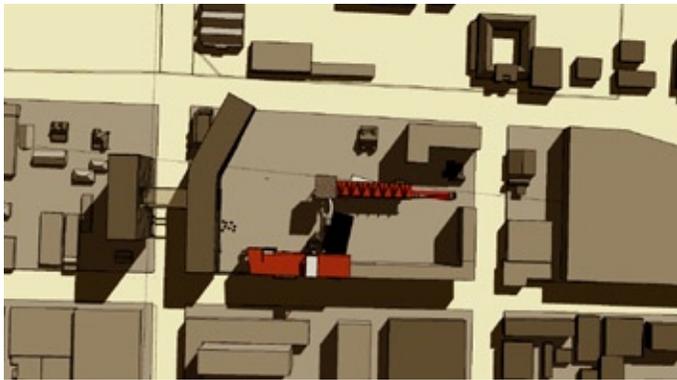


Fig 9.20: 21 June, 10h00

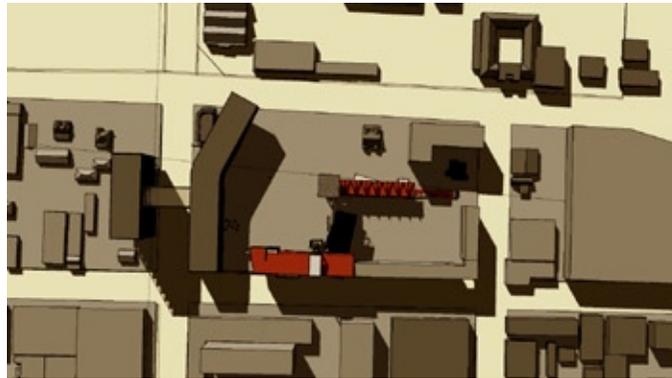


Fig 9.21: 21 June, 14h00



Fig 9.22: 21 June, 16h00



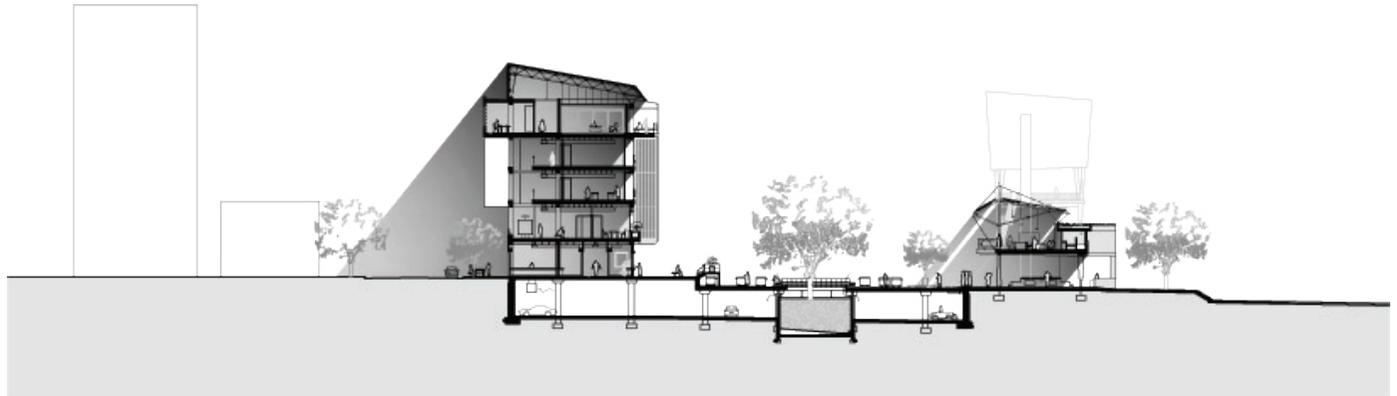


Fig 9.23: Solar penetration, 21 September at 10h00



Fig 9.24: 21 September, 10h00



Fig 9.25: 21 September, 14h00



Fig 9.26: 21 September, 16h00

TECHNICAL INVESTIGATION





10. CONCLUSION

There exists a growing migration from the rural environment to the urban context. Young adults brave the city life in search of a new lifestyle of independence, opportunities and potential.

The meeting place between the rural immigrants and the urban context is an archetype of the new urban life. It is vibrant, energetic, dynamic and diverse. The city holds a magnitude of possibilities, but the language and mechanics of the urban context is multi-layered and complex.

It is essential that a transition facility exists that orientates the rural immigrants in the language and mechanics of the urban context. This facility recognizes that the interaction between the rural immigrant and urban context occurs in various layers.

The facility is therefore an expression of the urban context. It showcases and facilitates the different layers of interaction between the rural immigrants and the urban context.



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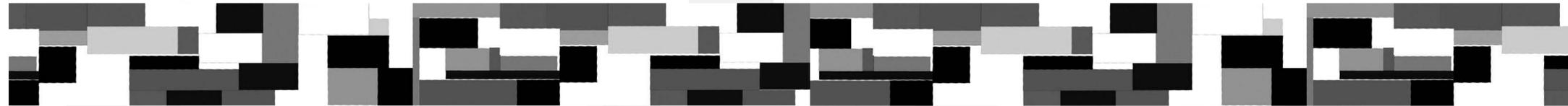
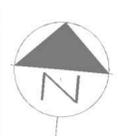
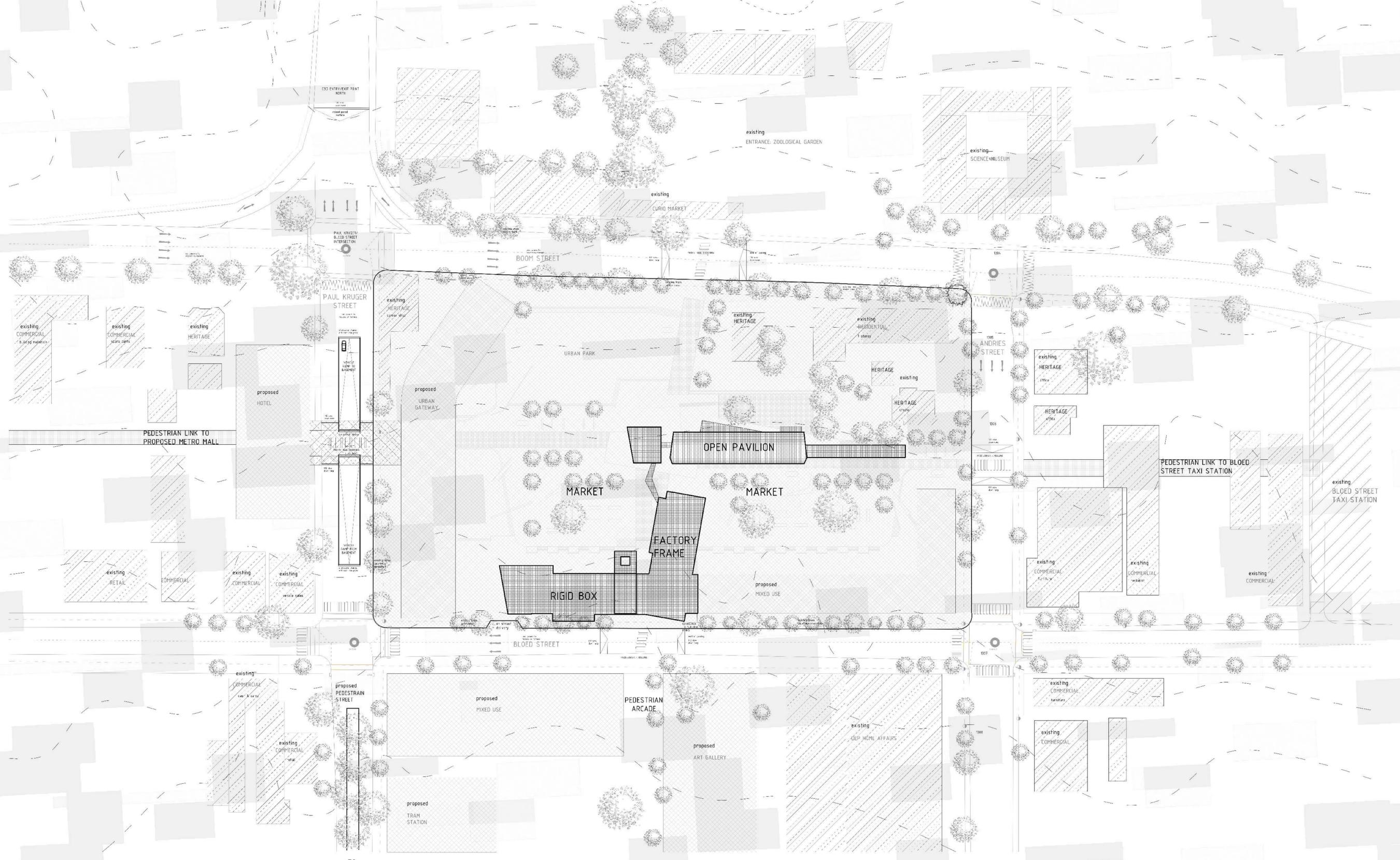
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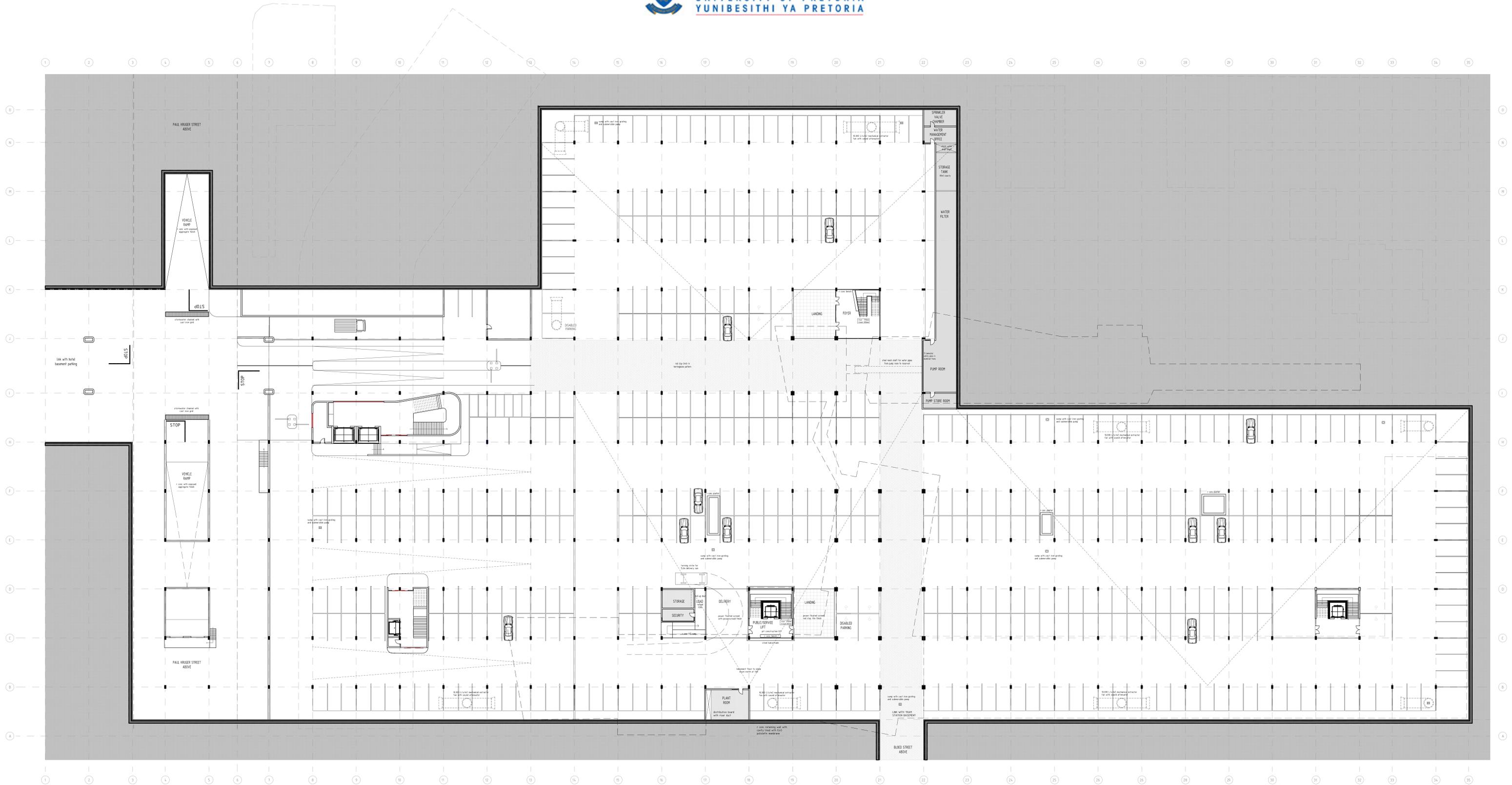
INTERVIEWS

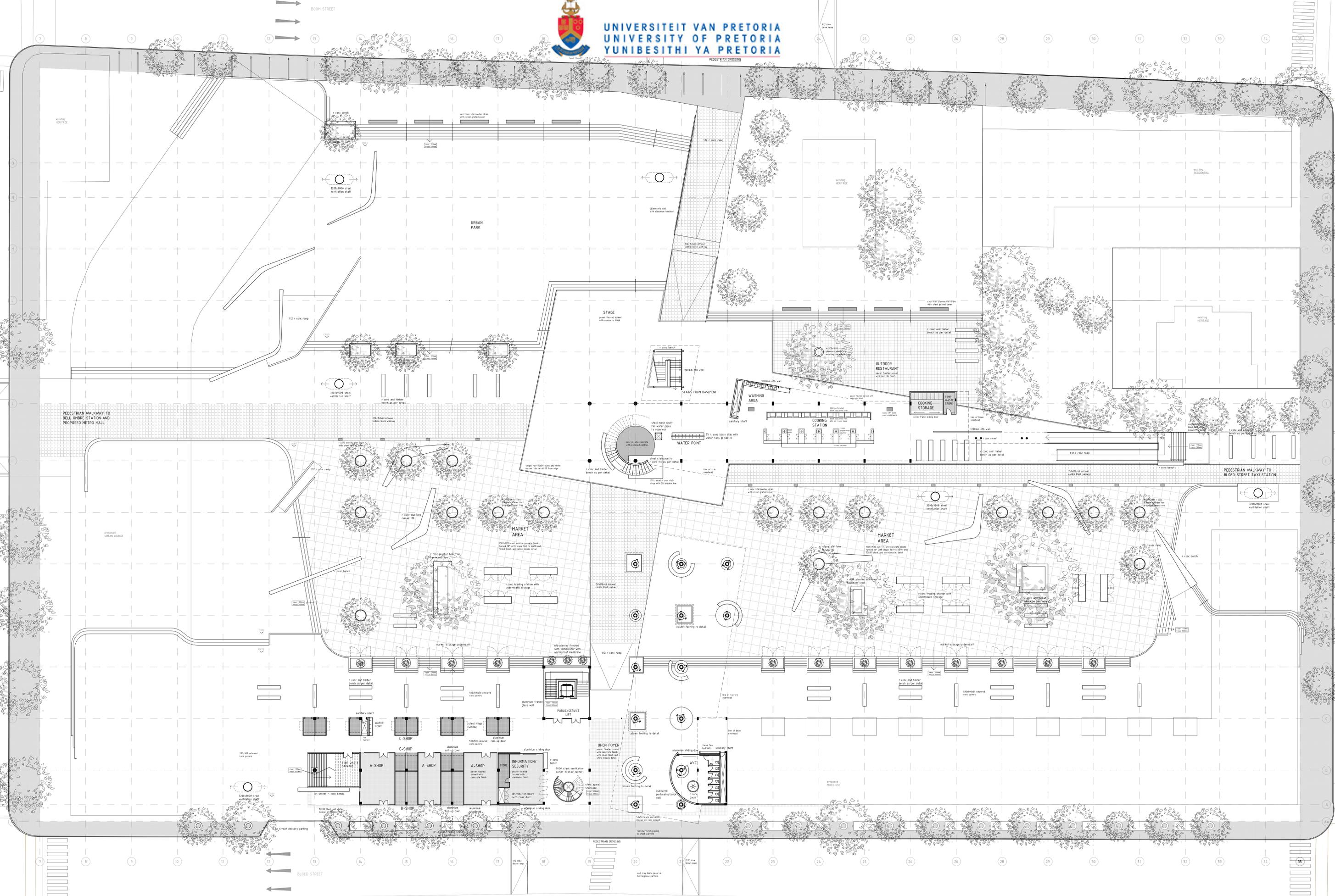
Bloed Street, 2007. Personal communication with traders operating on Bloed Street. Pretoria.
19 March.

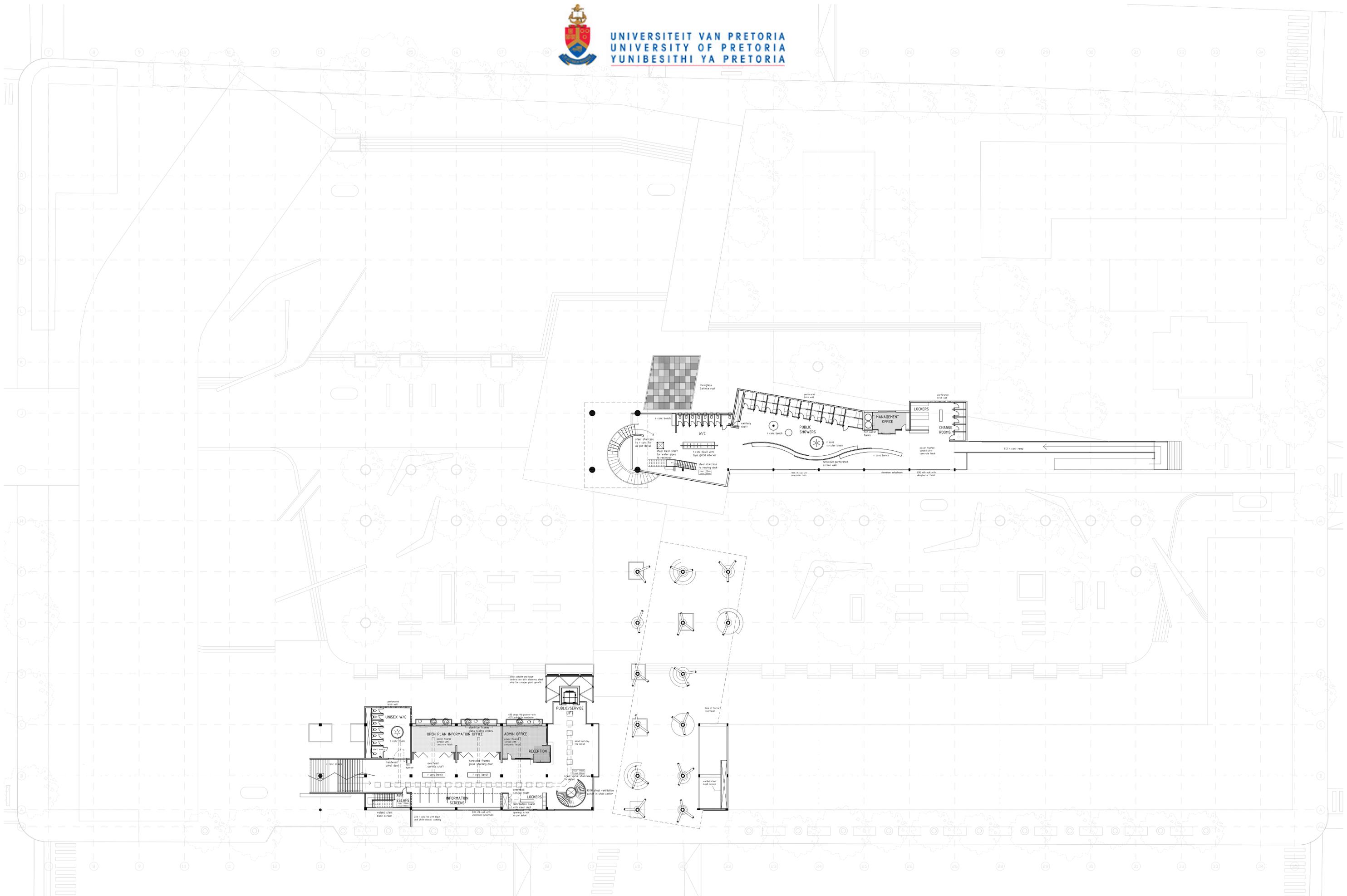
Zanele, 2007. Personal communication with Zanele, secretary. Yeast Housing Project. Pretoria.
23 February.

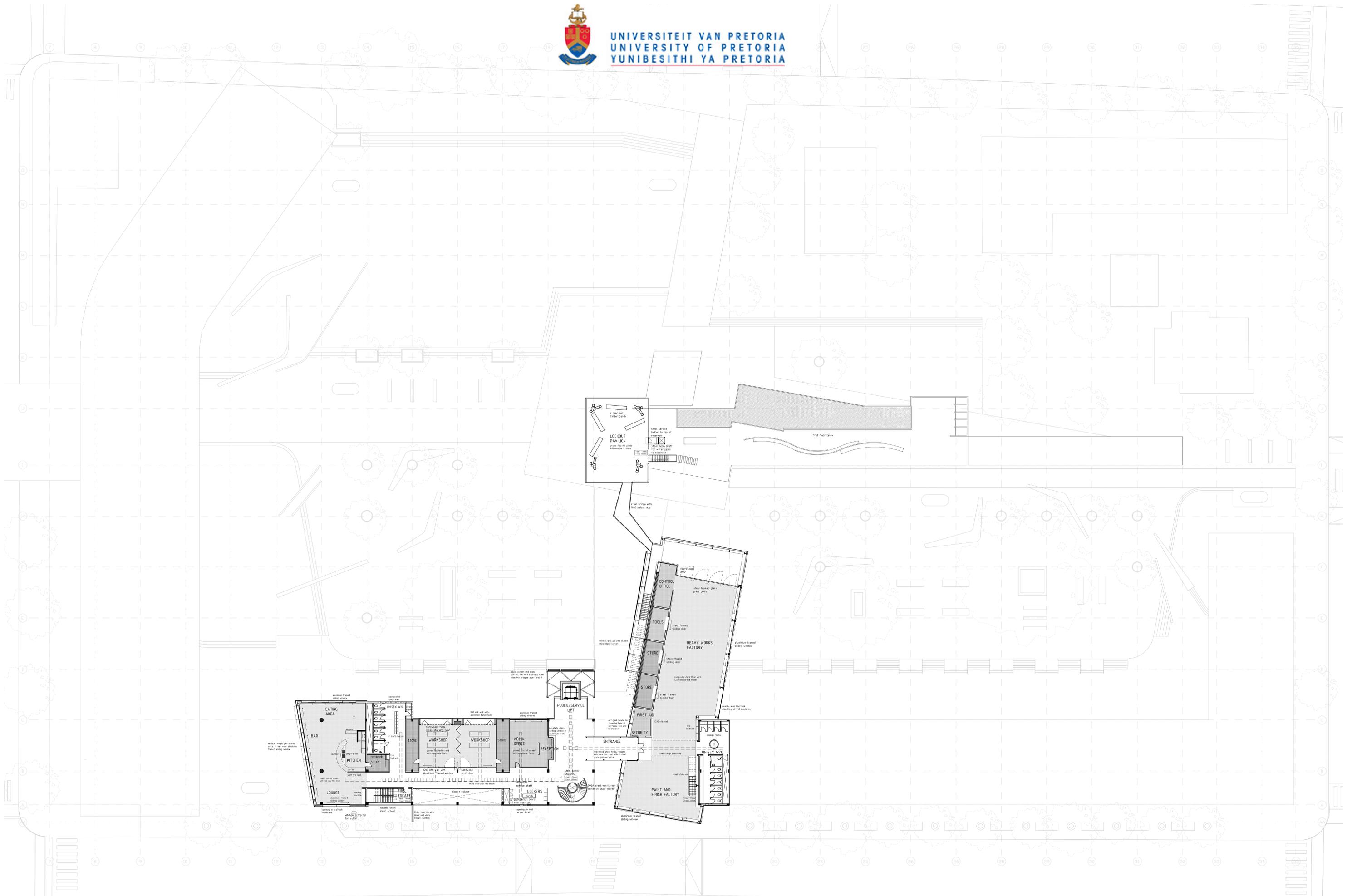


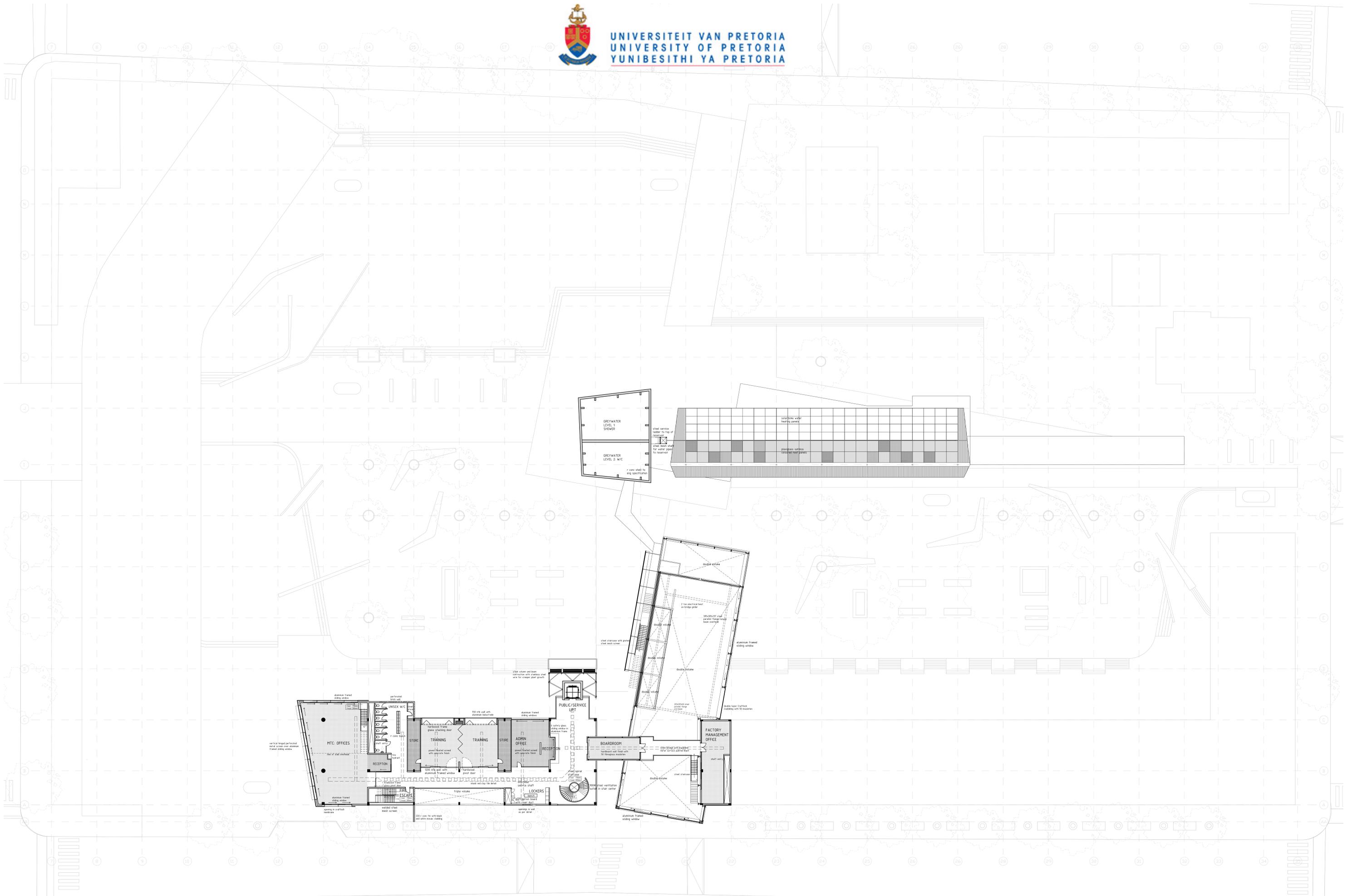


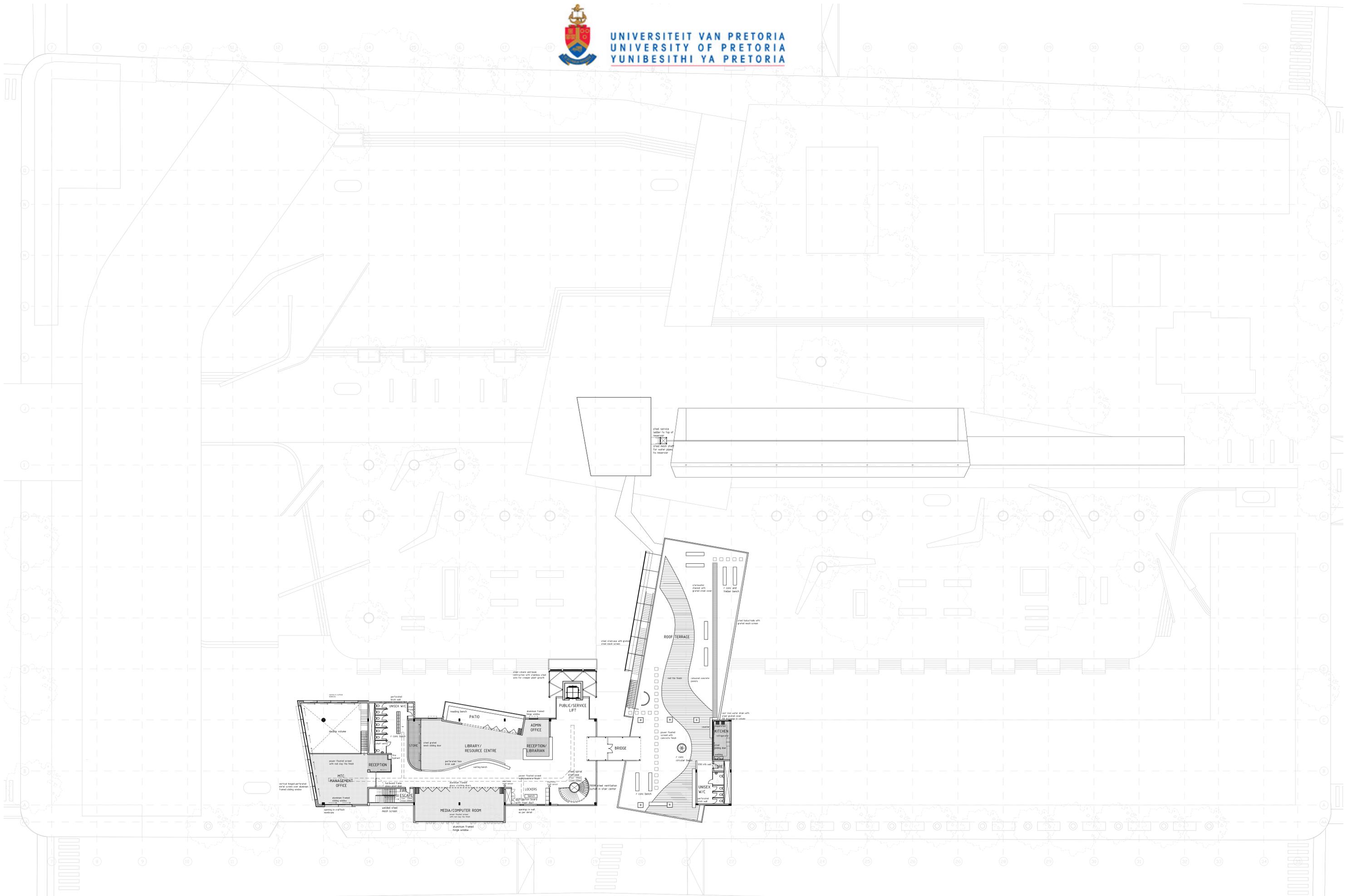






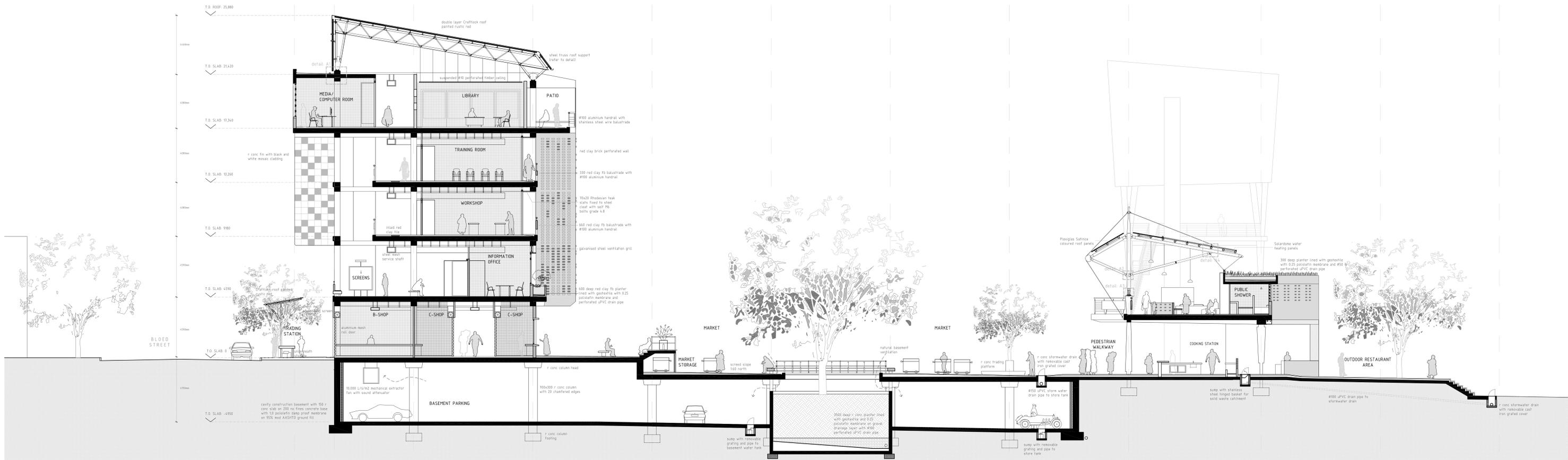




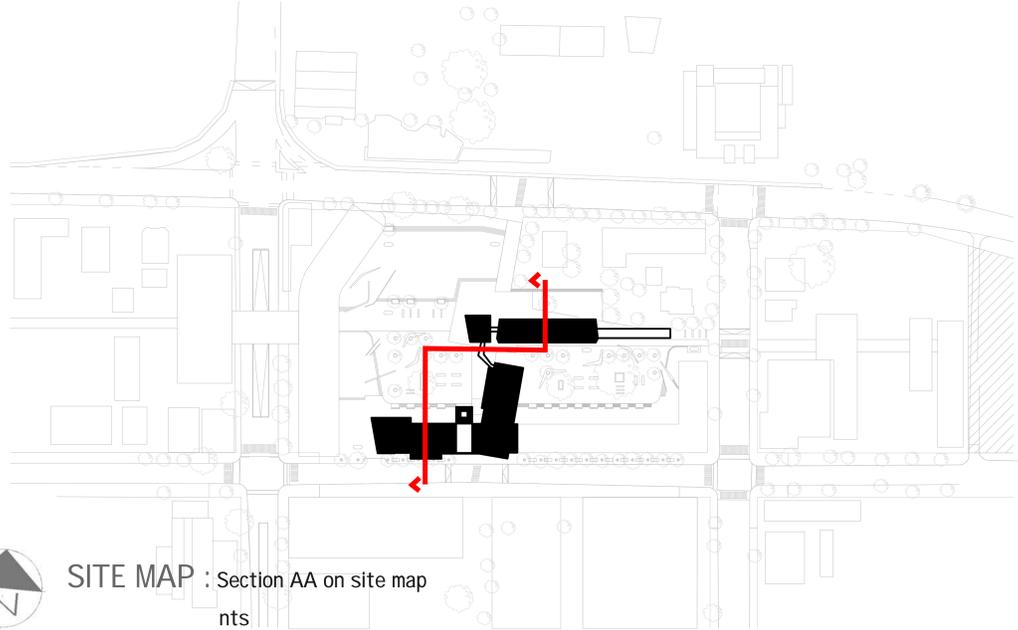




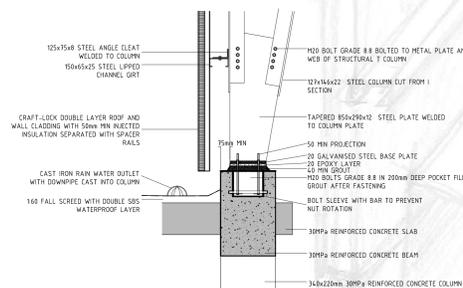
AA A B C I H I J K L



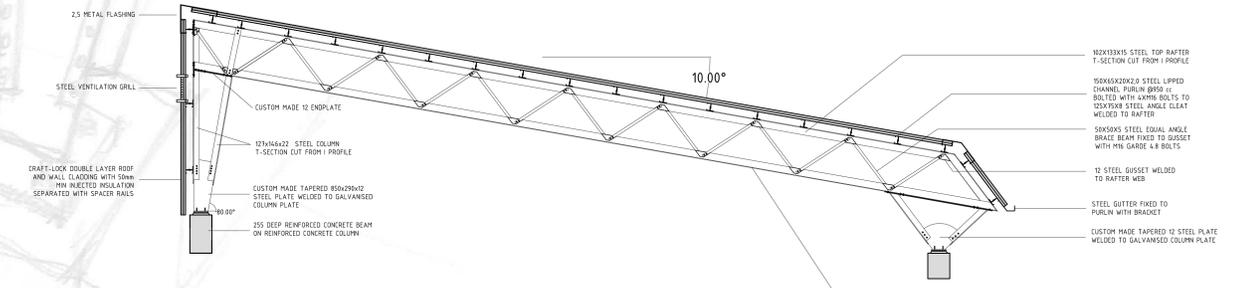
AA 1:100



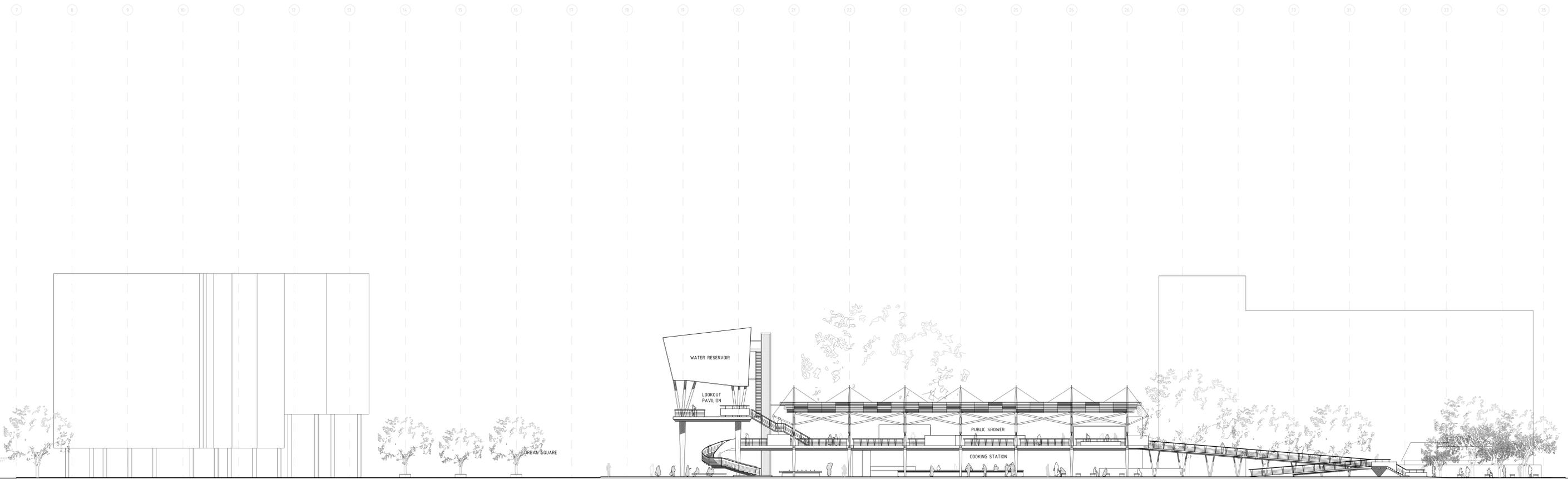
SITE MAP : Section AA on site map
nts



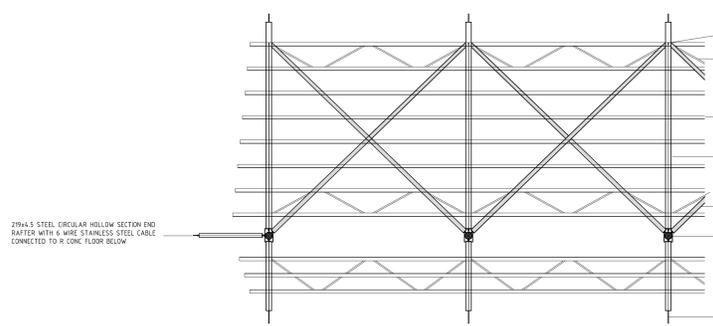
DETAIL A1 : Steel roof support fixed to concrete beam
1: 20



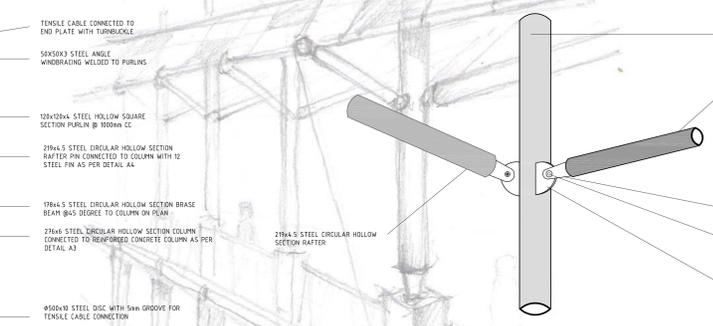
DETAIL : Steel roof support structure
1: 50



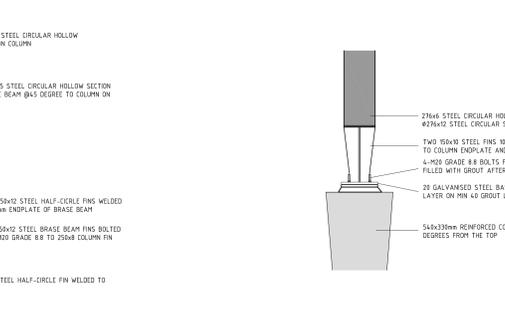
SOUTH elevation 1:200



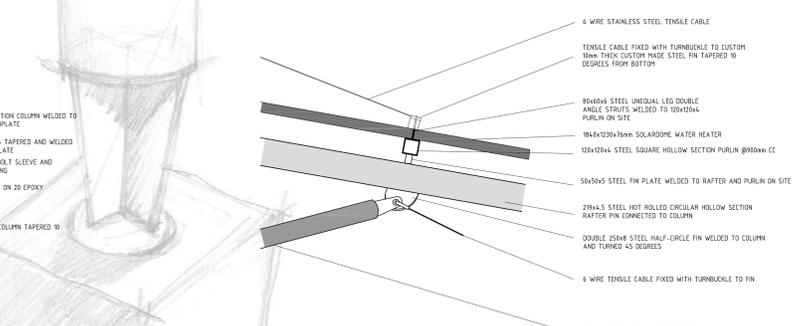
DETAIL : Plan of open pavilion roof structure
1: 100



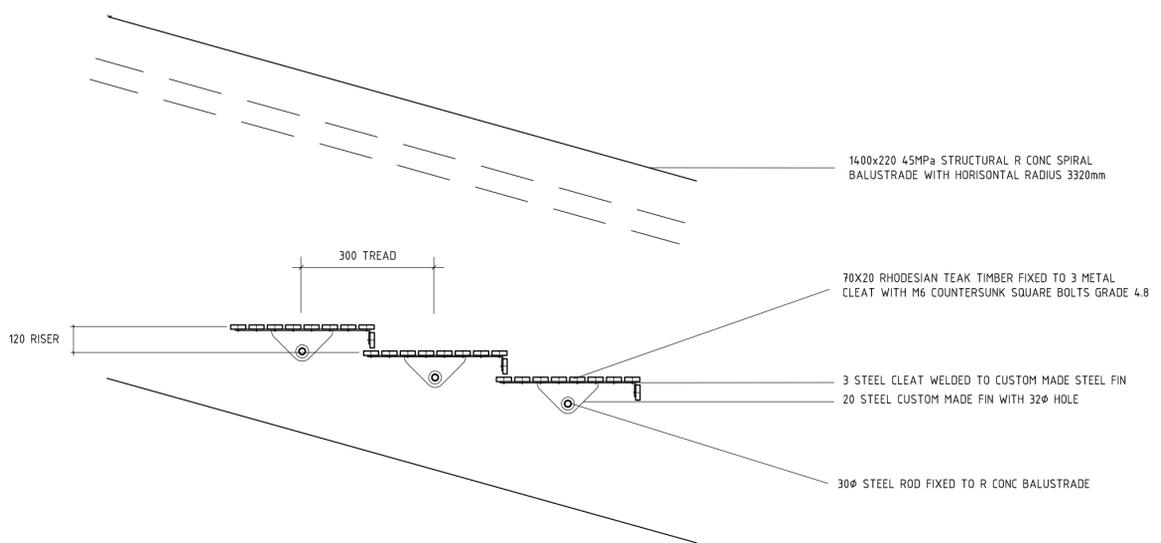
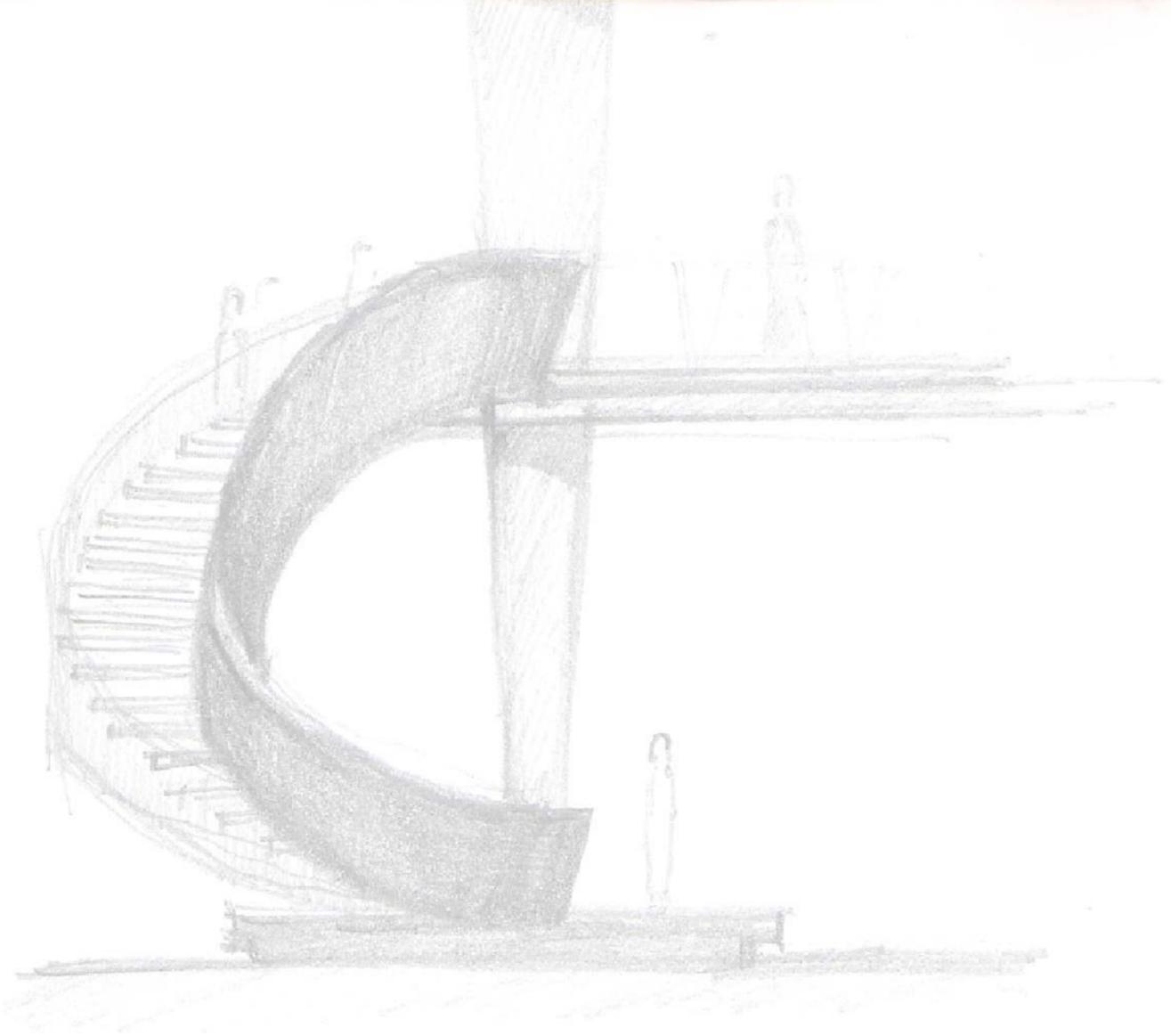
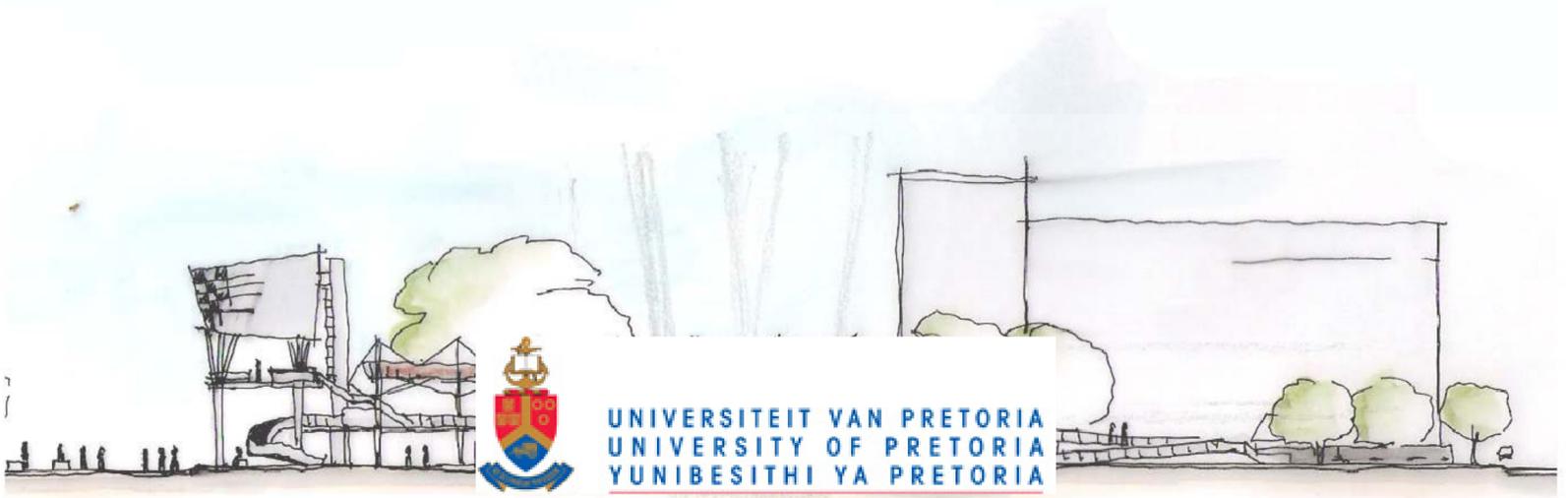
DETAIL A2 : Steel rafter pin-connected to steel column
1: 20



DETAIL A3 : steel column on concrete column
1: 20

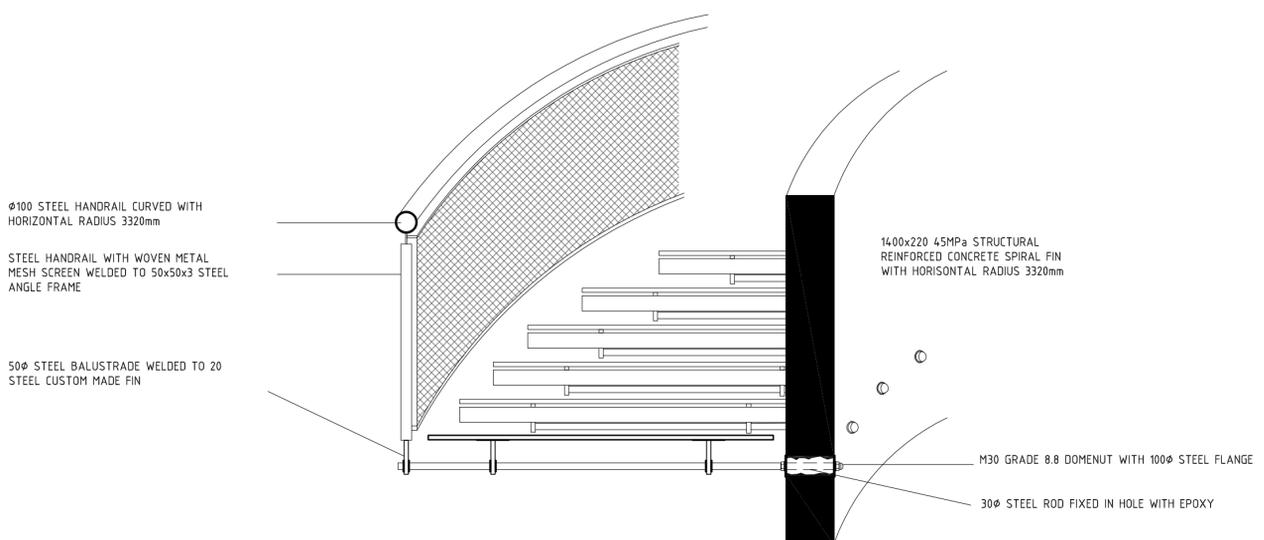


DETAIL A4 : Section through open pavilion roof structure
1: 20



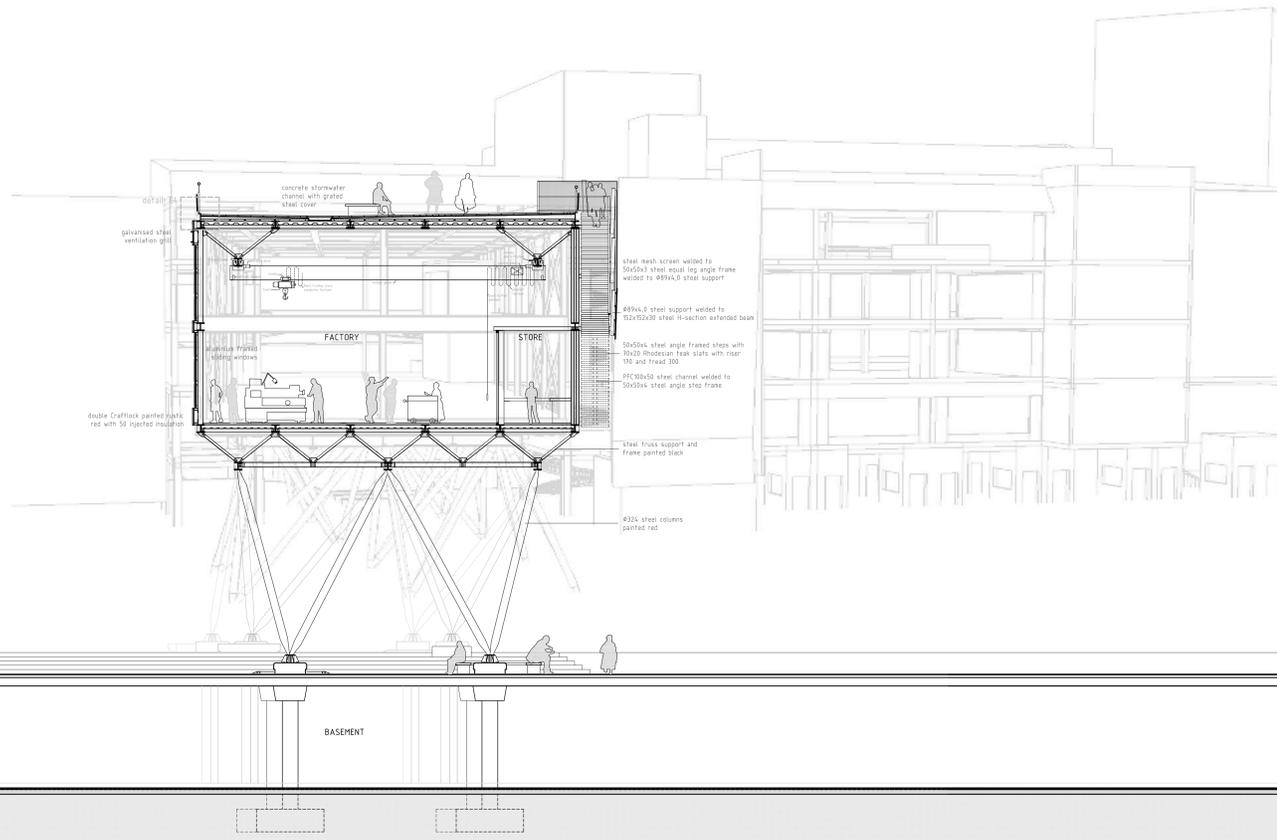
DETAIL : Section through concrete fin staircase steps

1: 20

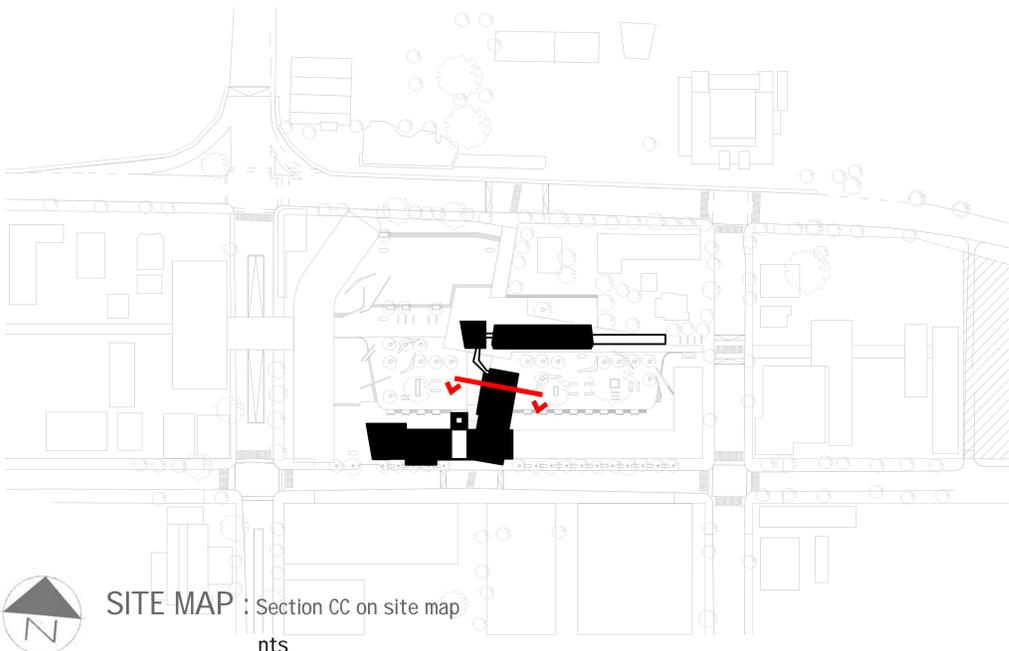


DETAIL : Section through concrete fin staircase

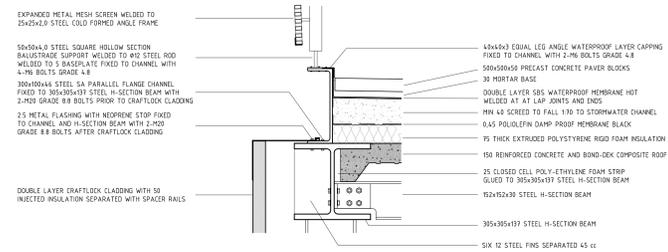
1: 20



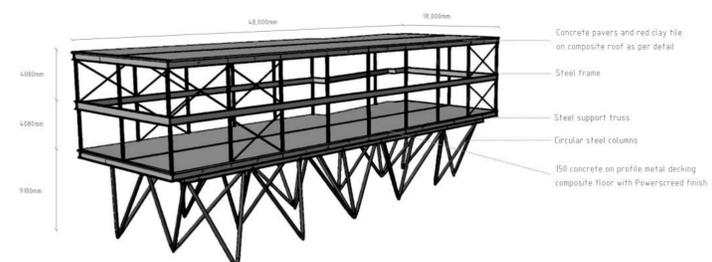
CC 1:100



SITE MAP : Section CC on site map
nts



DETAIL C1 : Roof structure over factory frame
1: 10



Steelworks:
All steel is to be painted with two coats zinc phosphate primer to comply with SABS 1319 before entering the site.
Structural steel is to be further painted with two coats intumescent paint to have fire resistance of minimum two hours.

DETAIL : Steel structure of factory frame
nts



13

14

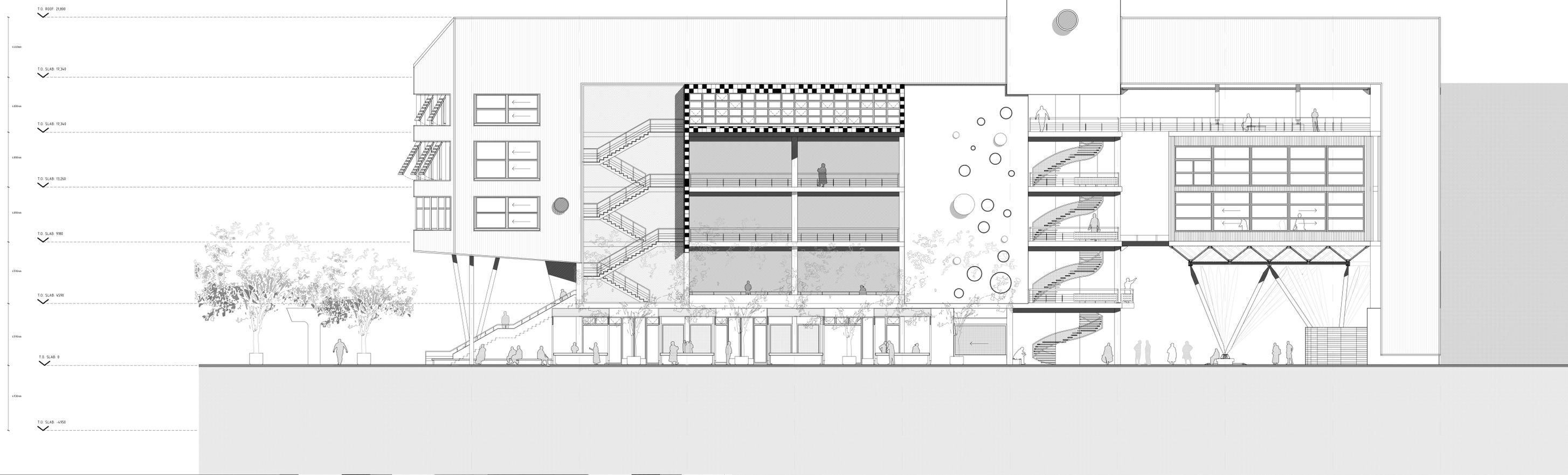
18

19

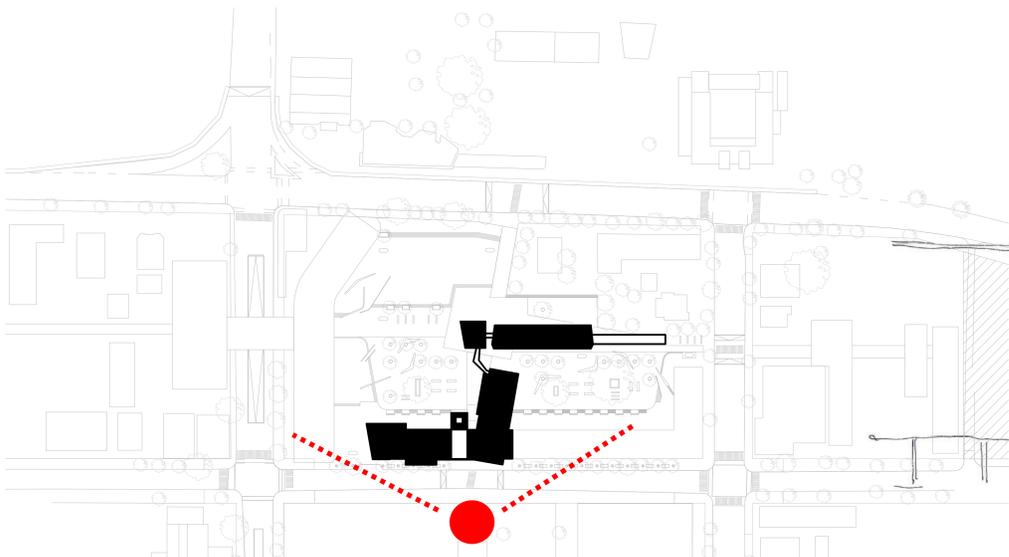
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21

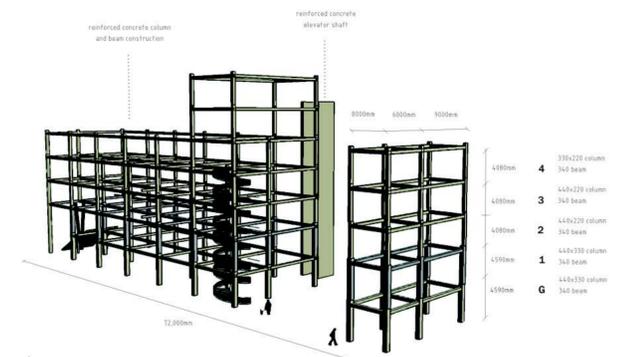
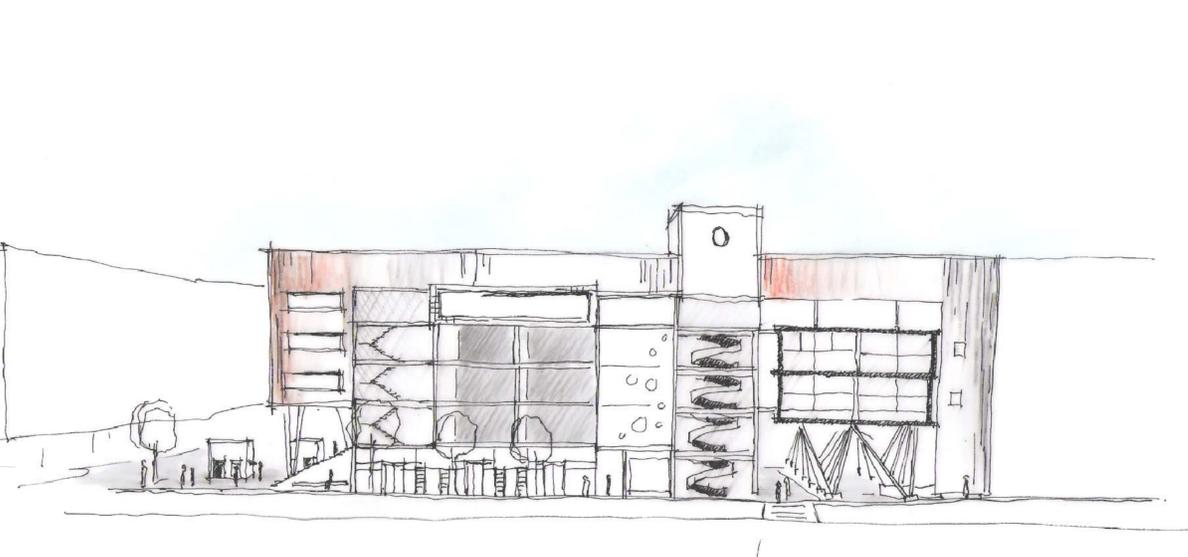
22



SOUTH elevation 1:100

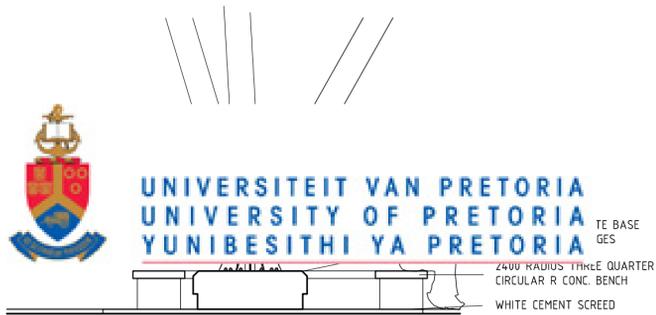


SITE MAP : View of south elevation
nts



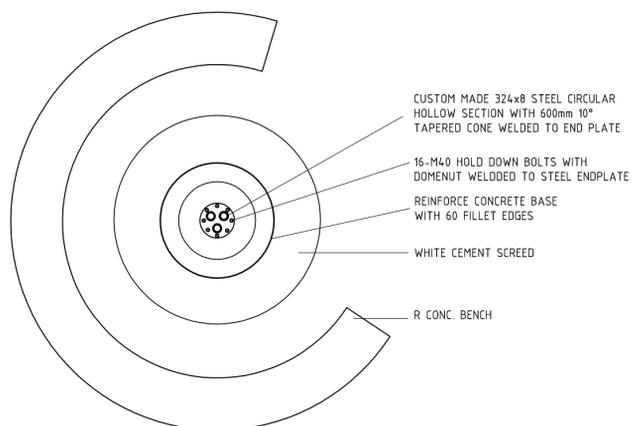
Concrete work:
Use min 30MPa concrete. All columns and beams to have softboard lining in formwork to achieve attractive finish and eliminate blow-holes and imperfections. Min 30mm concrete cover over steel reinforcement in concrete columns and beams.

DETAIL : Reinforced concrete structure of rigid box
nts



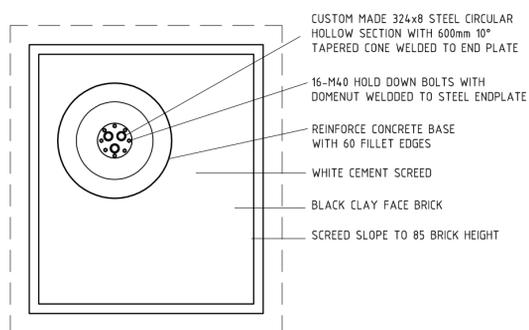
DETAIL : Elevation of column footing, type A

1: 50



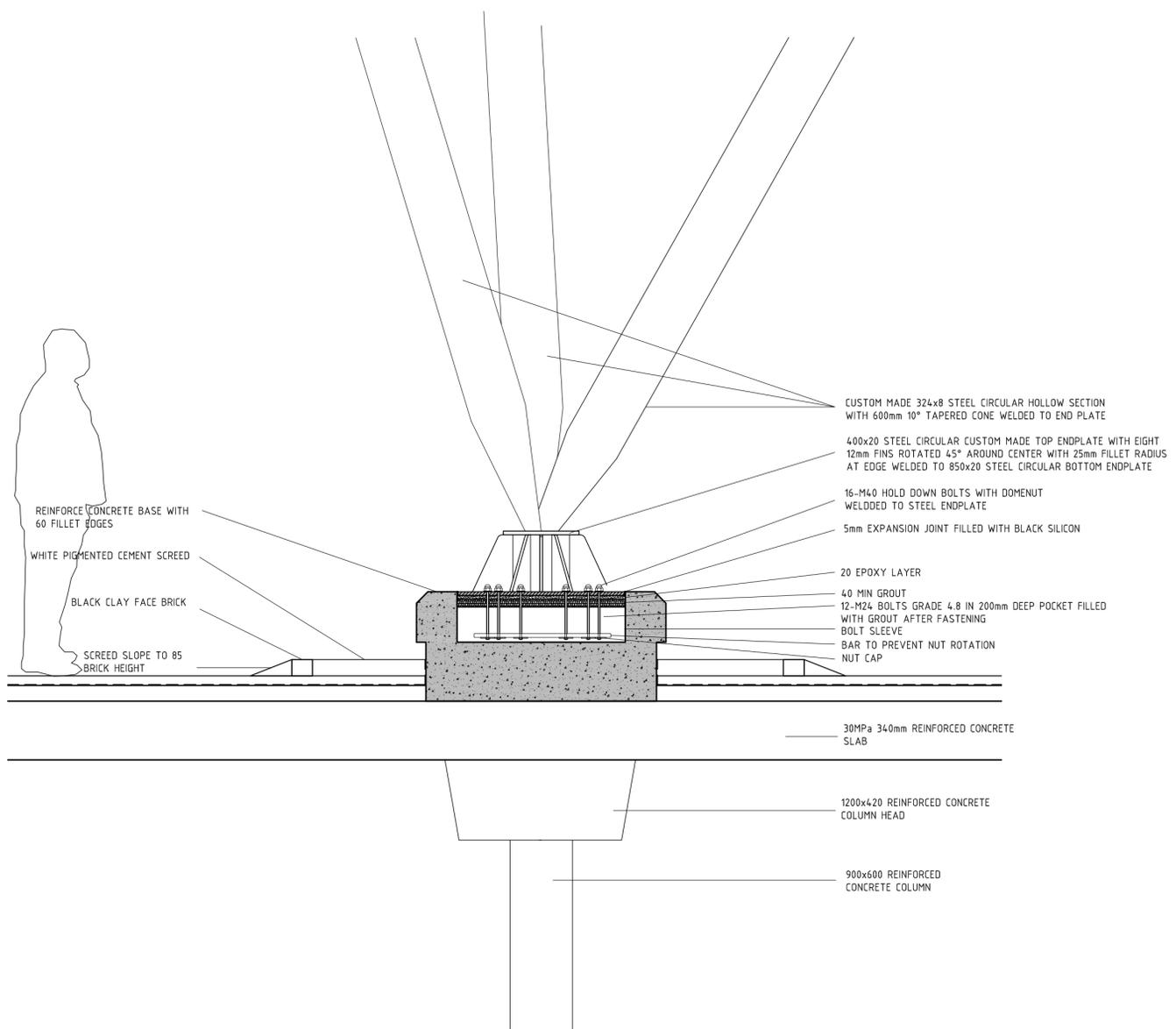
DETAIL : Plan of column footing, type A

1: 50



DETAIL : Plan of column footing, type B

1: 50



DETAIL B4 : Section of column footing, type B

1: 20