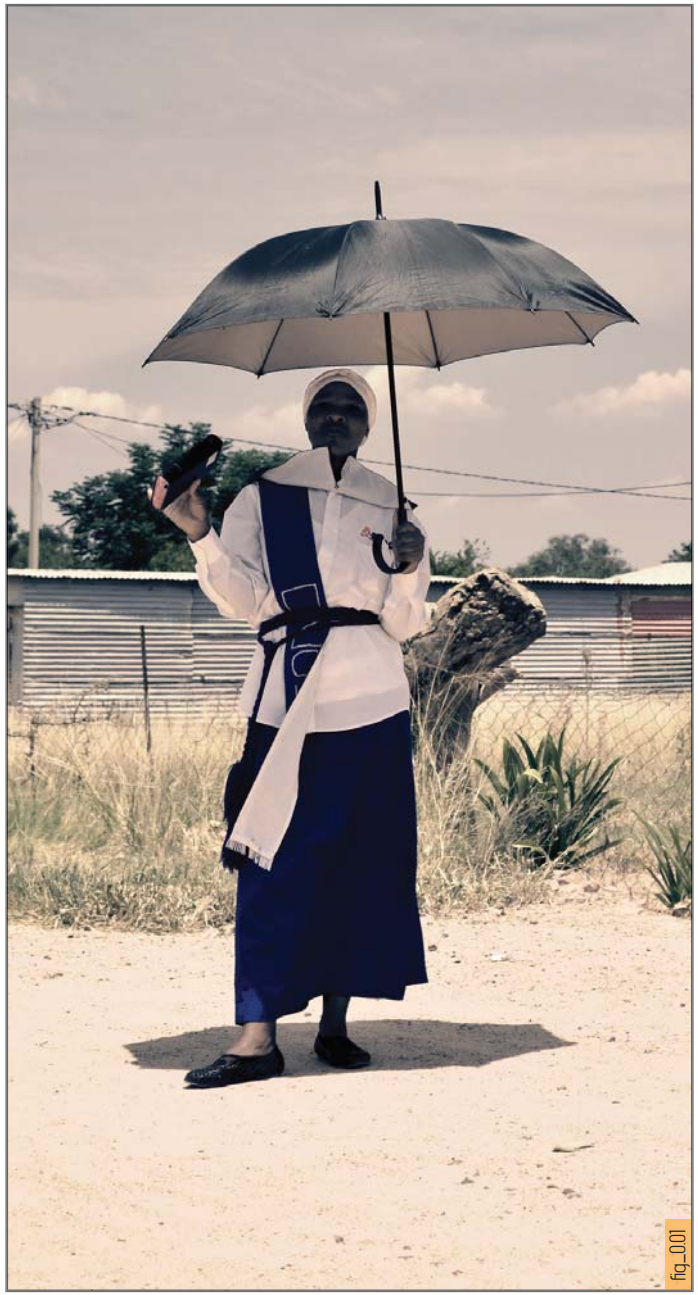
# |re-connecting|

## the divide

An integrated trade and transport node for the Hammanskraal commercial precinct

Eghardt P. Pieterse

"Passenger rail has the potential to be the most efficient, affordable and safe mode while more than trebling the patronage levels over the years. It could form the backbone of an efficient and reliable public transport system. With its fixed nature, rail has the potential to defend the 'urban edge' and ensure greater integration between land use planning and transport infrastructure provision. This is vital to creating sustainable communities where people's access to economic and social opportunities is enhanced. " [www.metrorail.co.za]




Dankie aan almal wat 'n bydra gehad het tot hierdie projek, groot en klein, oud en jonk.

Aan my ouers, dankie vir julle geduld, liefde en ondersteuning deur my vele jare van studies.
Sonder julle sou hierdie projek nooit gerealiseer het nie.

Hierdie projek word opgedra aan my oupa Gert 'Swazi' Pieterse.
Ek weet oupa sou trots gewees het.

by Eghardt Phillipus Pieterse

Study leader: Gary White
Course coordinator: Dr. Jacques Laubsher (January - July 2012)
Dr. Arthur Barker (August - December 2012)

Submitted in fulfillment of part of the requirements of the degree Magister in Architecture [Professional]
Department of Architecture in the Faculty of Engineering, Built Environment and Infromation Technology,
University of Pretoria, South Africa, 2012

fig_0.02

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

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

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

Eghardt Phillipus Pieterse
November 2012

# Abstract

This dissertation addresses the reestablishment of the Hammanskraal train station, by providing an integrated transport node that includes a variety of community functions. The aim is to re-introduce the Station-area as a significant trade and transport node in the Hammanskraal community. The main routes linking to the railway station and the surrounding urban fabric are re-evaluated and altered to accommodate not only the railway programme, but also to better suit the growing needs of the community.

Theoretically the project explores the influence architecture and spatial perceptions have on the social behaviour and the interactions between different users in these spaces. These relationships are explored to create architecture that not only responds to existing conditions but also becomes a landmark in the area and a reference for future developments in the area. The theoretical investigation can be applied in a design such as the new Hammanskraal station as the characteristics and scope of this node need to integrate different users and functions. Integrating these aspects into the design leads to new forms of interaction and spatial appropriation.

The closure of the public component of the railway station resulted in the degradation and neglect of a site that is located within one of the busiest social and commercial nodes of the Hammanskraal Township. The suspended long distance commuter service in favour of the taxi and bus service has resulted in the lack of transport options to thousands of daily commuters between the township and the Pretoria CBD. The new Hammanskraal Railway interchange aims to reconnect the local residents, with a more economic means of travel, to the Pretoria CBD as most of them commute there for work opportunities. Integration and interaction between rail and road transport and numerous informal traders, within a vibrant urban space, are the main focus areas of the design. The design's intent is to provide a reconnected township, while addressing the immediate needs of the site and the community.

The redesign of the Hammanskraal Station precinct does not only reconnect the township to the railway system, but reintroduces much needed energy and public functions to the township itself while providing new economic opportunities both locally and in the surrounds.

fig_0.03

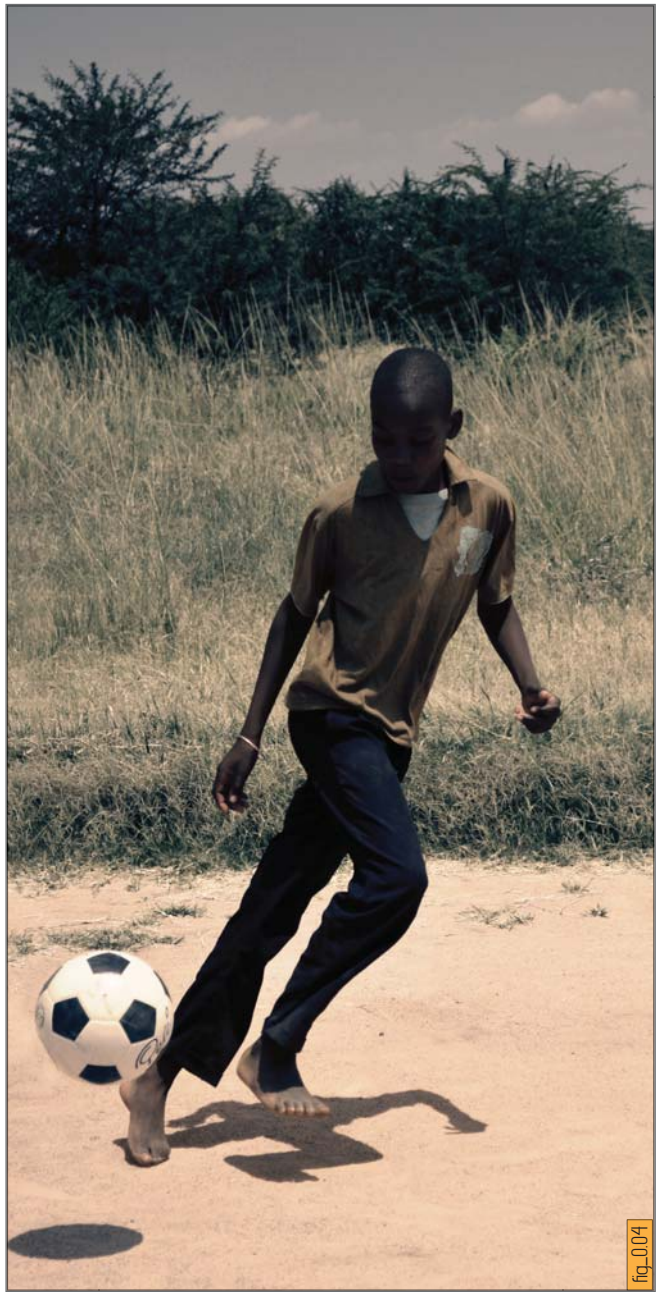


fig_0.04

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*All images in this dissertation were created by the Author during 2012, unless otherwise indicated*

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## Chapter 6_Site Context



## Chapter 7_Architectural Programme

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fig_005

fig_1.01

# Chapter 1
## Introduction

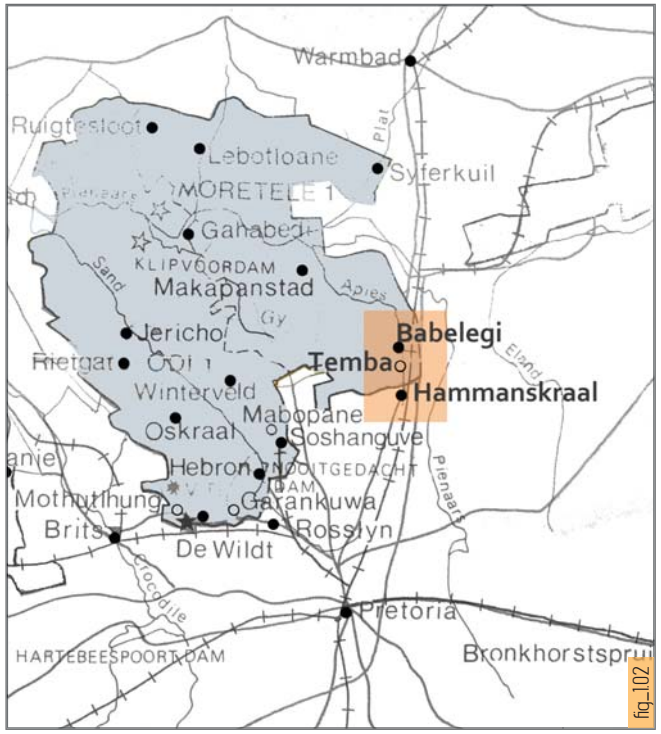


Hammanskraal is a township isolated from socio-economic stimulus because of insufficient and uneconomical public transport systems. It can therefore benefit significantly from a newly activated transport oriented commercial core. The reestablishment of a node within the transit network and the neighbourhood is needed to re-energize current and future development in the area. Cooke (2012: 1) states that because of the nodal nature of transport terminals and their resulting function as collective gateways, they become memorable and major structuring elements in cities.

Re-appropriation and integration of the dilapidated Hammanskraal railway station within the existing public transport network can become a catalyst for rejuvenating and structuring development in the decaying and chaotic commercial precinct.

**Fig_1.01** Two ladies next to the road on their way to church **[Author, 2012]**

# 1_01 Background and context




Situated 50km north of the Pretoria CBD is the Hammanskraal/ Temba Township, one of the farthest townships to the north leading out of the Gauteng Province. A peri-urban township located close to a large urban core with surroundings of mainly agricultural farmland. The vast expanse of agricultural land separating it from other central areas, like Pretoria, renders it fairly isolated as stated by the Tshwane Project Status Quo Report (2009: 2). Its establishment and evolution has to be viewed in terms of its context as a formally divided area between a homeland, Bophuthatswana, and the then Apartheid regime of South Africa as shown in fig_1.02. Various social structures and town layout schemes contribute to this vibrant community. Figure_1.03 -06 shows the location of Hammanskraal in South Africa.

Hammanskraal has turbulent origins rooted in segregation, forceful relocation of people during Apartheid and a struggle with identity, because of the area's earlier zoning within several provinces. This is presented in a paper by Van Huyssteen (2000: 7) of the University of Pretoria, at the South African Planning History Study Group: Millenium Conference. Hammanskraal/ Temba has developed as a township with diverse histories and unique urban evolutionary patterns. The township consists of a variety of cultures and ethnicities, with clearly visible cultural boundaries regarding the formation of space within certain areas. These included Temba, the reconstruction of veld into a homeland town, Babelegi, a border industrial town with Hammanskraal as a white industrialist sleep town and Mandela Village, an informal squatter camp transformed into a formal township. A tangible and intangible tension exists between tribal land and the municipal planned urban development.

Historic research depicts Hammanskraal as a white industrialist town as stated by Van Huyssteen (2000: 9), which expanded with, the establishment of the Babelegi industrial precinct to the north. Temba came into existence as the result of forceful relocation of people of colour from the then white suburban and urban areas of Pretoria and Johannesburg.

These two areas function both as a node and a destination among the railway line stretching from Pretoria to the south and further towards Johannesburg, and to neighbouring countries like Zimbabwe to the north. This connection with other key nodes in Gauteng and beyond made Hammanskraal and Temba preferred settlement areas for low income working class citizens. Another contributing factor is the train commuter service being an economical means of transport to work opportunities in surrounding areas.

Archival literature from the South African Institute of Race Relations (1990: 85) reports on the discontinuation of the train commuter service between Hammanskraal and the Pretoria CBD on the 1st of March 1989. The passenger service was last fully operational in October 1986. Favouring the bus services of the former 'Homeland' of Bophuthatswana, is a reason for the railway closure stated in the 2004-2009 City of Tshwane Integrated Transport Plan.

The severed connection between the Pretoria CBD resulted in heavy public outcry amongst the local residents, and the once well connected commercial nodes within the township became neglected. This resulted in the railway station site becoming dangerous due to the high concentration of drug use and criminal activity in the area.

**Fig_1.02** Map indicating the projects location in the homeland of Bophuthatswana **[Author, 2012]**

**Fig_1.03 - 06** Maps indicating the location of the project **[Author, 2012]**


fig_103

# South Africa

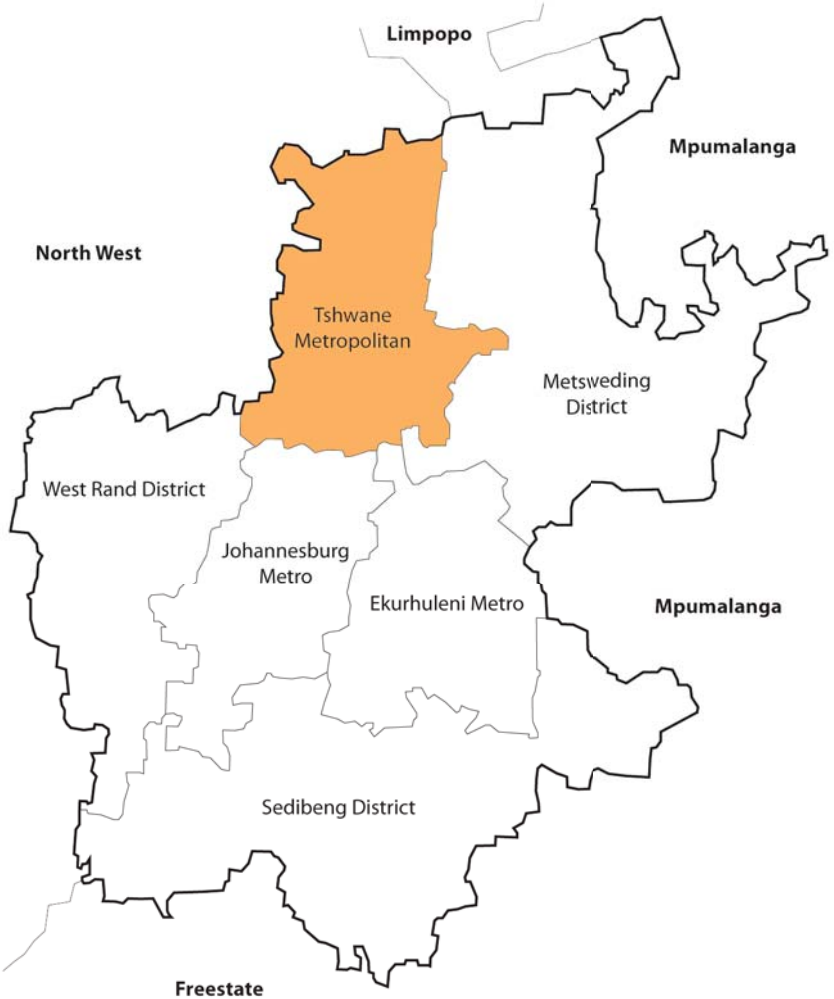



fig_104

# Gauteng


fig_105

# Tshwane


fig_106

# Hammanskraal

# 1_02 Stating the problem

The ease of commuting to economic opportunities, in the Pretoria CBD and richer surrounding suburban areas is severely compromised for the largely impoverished communities of Hammanskraal and Temba, by the discontinuation of the connecting commuter train service in the late 1980's. The further isolation of an already remote township, the contribution to urban decay because of unused central urban property and the encouragement of poverty through more expensive transport alternatives are the effects of this means of transport that has been taken away from the public.

This condition is most visible at the Hammanskraal railway station, figure_1.07, where years of neglect and disuse have left the station, historic railway buildings and the surrounding landscape in a state of serious disrepair. In some cases, buildings have turned into ruins while previous functions like commuting through the railway station have diminished considerably.

Problems identified at the railway station site are:

The public perception of the site is that of a dangerous area, because of its isolation and criminal activities associated to it, such as drug use and illegal squatting.
[Possible solution] Through the creation of safe and healthy environments, by means of pedestrianization and passive surveillance, these problems can be combated.

The discontinuation of the railway service contributed to the loss of function, public interface and interaction of and with the site. This resulted in the loss of importance of the site and the station, which brought about the neglect and disregard of the building structures.
[Possible solution] By restoring function to the site, its importance in the community could be reestablished, bringing with it a sense of pride and ownership towards the area.

Movement is mostly directed around the site and not through it because of prominent barriers such as the river, figure_1.10, the railway and roads around the site.
[Possible solution] Pedestrian movement through the area could be restores by providing an important node, like the railway station.

With inadequate space located to informal traders, they tend to occupy sidewalks and other spaces that either disturb pedestrian movement or infringe on established business's property. See figure_1.08.
[Possible solution] By providing robust spaces along highly trafficked pedestrian routes, informal traders can be formalized. This does not only have implications for spatial legibility, but also aims to give a more prominent status to the informal trading sector.

The lack of basic infrastructure in and around the study site is evident in the amount of pollution and overall vacant face of the site, seen in figure_1_09.
[Possible solution] Appropriate materials can be used to create circulation paths in and around the site, increasing the aesthetic appeal of the area.


fig_1.07

fig_1.08


fig_1.09

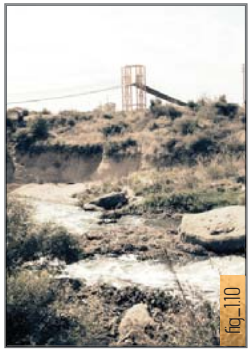


fig_1.10

**Fig_1.07** Current approach and state of the Hammanskraal Railway Station **[Author, 2012]**

**Fig_1.08** Trading stalls occupying sidewalks **[Author, 2012]**

**Fig_1.09** Rubbish littering the streets and land next to the road **[Author, 2012]**

**Fig_1.10** The river is one the natural barriers in the area, located to the west of the study site **[Author, 2012]**

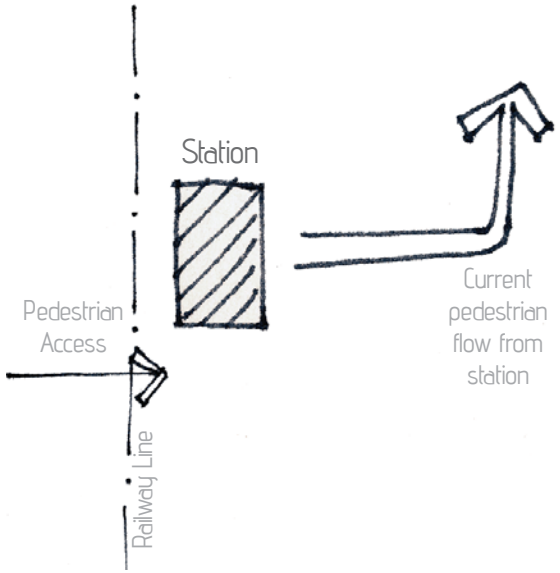



fig_1.11

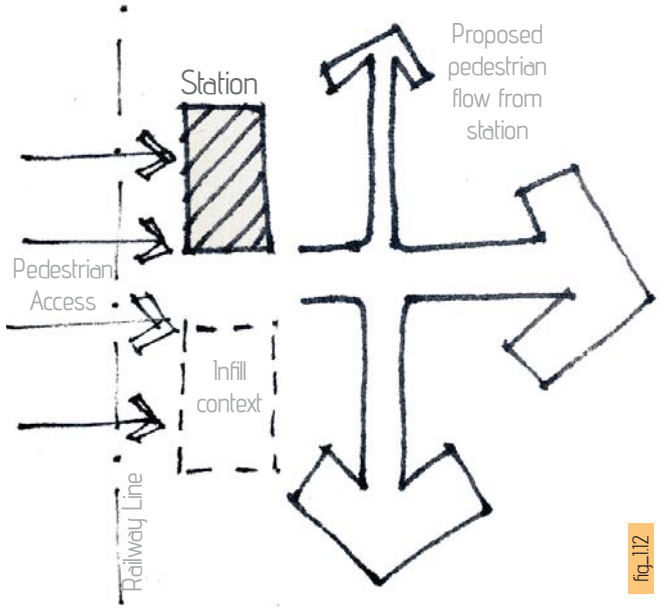



fig_1.12

## 1_03 Hypothesis

It is hypothesized that redesigning the Hammanskraal railway station as a landmark building and transit node, combined with enhanced integration into the larger existing transport network, would reestablish socio-economic activity in the surrounding precinct and act as a catalyst for future development in Hammanskraal. See figure_1.11-12 for illustration.

The author defines the integration of informal and formal trade and the creation of synergy between the two as socio-economic activity. Enhanced interaction between local residents and synergy of trade is sought to create a vibrant and energetic transport and trade hub.

Currently the heart of the Hammanskraal commercial precinct is situated east of the railway station along the route leading into the district. The above hypothesis statement lends itself to the idea that the reactivated railway station will draw the trading and social energy closer to the station, thereby extending the heart of the commercial precinct and attracting more people to the site. See figure_1.13-15 for illustration.

## 1_04 Research Questions

- How does the synergy between formal and informal activities manifest in the proposed transportation and trade node ?
- Can the reactivation of the Hammanskraal railway station, as part of a larger transport node, aid new economic activity in the Hammanskraal commercial precinct?
- What is good outdoor public space and how does it influence a persons interaction with surrounding buildings structures and other people?

Current

fig_1.13

Proposed

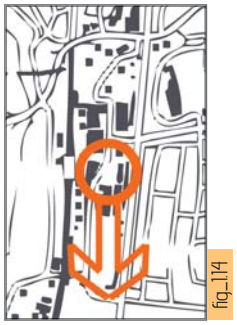


fig_1.14

Final

fig_1.15

**Fig_1.11** Current main pedestrian flow pattern around station and pedestrian bridge across railway tracks **[Author, 2012]**
**Fig_1.12** Proposed pedestrian movement patterns once railway station is reopened and route indication elements are designed **[Author, 2012]**
**Fig_1.13** Map indicating current pedestrian and trade energy **[Author, 2012]**

**Fig_1.14** Map indicating proposed pedestrian and trade energy along newly established spine **[Author, 2012]**

**Fig_1.15** Newly functioning pedestrian and trade spine running through the heart of the commercial district **[Author, 2012]**

## 1_05 Approach to research

*Chapter 1 – Introduction* gives a broad background into the site and its history. In this chapter the location of the site within its context as a South African township is illustrated. Along with an introduction to the site, problems associated with the site are stated and possible solutions hypothesized.

*Chapter 2 – Project Justification* states what the intended design solution would be and introduces the different role players who will benefit from the proposed design solution. The chapter elaborates on the current condition of public transport in South Africa and why the design solution would be of importance within its context.

*Chapter 3 – Theory* investigates the influence architecture can have on social behaviour and peoples engagement with space and structure. Supporting theories regarding this topic are discussed in the chapter.

Theories on transport architecture as connector and catalyst are investigated, as well as Roger Trancik's theory of invisible space, to form an understanding of how to revitalize deserted and neglected spaces with inherent potential.

A study on the effect transport has on urban space, more particularly the impact of transport nodes on their surroundings and what the contribution of these entities could be to an urban precinct. A further aim of this chapter is to investigate different methods of formalizing informal industries, like trade and taxi's.

The above study is presented in the form of precedent studies in *Chapter 4 – Precedent studies*, and it exhibits how other South African architects have dealt with transport architecture. In *Chapter 5 – Urban Framework*, existing frameworks, as well as proposed interventions through government departments, have been analysed and interpreted to establish areas of importance to the locals and authorities as well as to understand what design aspects have led to current spatial issues.

Research methods comprising of personal experience, observations and interpretation of the site has been used. Along with interviews and discussions with local residents, photo documentation of the site and surroundings has been used extensively. In order to understand the underlying order patterns of the different precincts, historic accounts and literature of the area has been gathered. A study of the historic development of the area will shed light on these occurrences. This information is presented in *Chapter 6 – Site Context*.

*Chapter 7 - Architectural Programme* discusses the different main components of the dissertation project and their requirements. It also explains how the different parts link to each other.

*Chapter 8 - Design Development*, documents significant design decisions which shaped the design and structure of the building.

In *Chapter 9 - Technical Resolution*, sustainable systems and detailing are shown as well as the final design drawings.


fig_1.16

**Fig_1.16** Unsafe and illegal crossing of railway tracks due to non-provision of safe pedestrian crossing **[Author, 2012]**

fig_2.01

# Chapter 2
# Project Justification



"A change of transport mode by definition generates commercial opportunity."
**Julian Cooke (ArchSA, 2012: 1)**

**Fig_2.01** Informal soccer match next to Leeukop dam **[Author, 2012]**


fig_2.02


fig_2.03


fig_2.04


fig_2.05

# 2_01 Current conditions

## Public transport in South Africa

In March 2007, the South African Cabinet approved the Public Transport Strategy (PTS) and the Action Plan for transport in the country for 2007 – 2020. Included in the plan is the transformation of bus and rail services into a public transport system integrated with recapitalised taxi services as well as quality service along priority corridors. A key feature of this strategy is the establishment of an integrated feeder service, including walking, cycling, bus and taxi networks (South Africa Yearbook, 2011: 516).

For the 2010 Soccer World Cup, South Africa upgraded public transport to such an extent that, by 2020, more than 85% of South African urban populations will reside within one kilometre from an integrated rapid public transport network (*ibid*: 522).

The Rural Transport Strategy, of December 2007, states that rural infrastructure includes job creation and improved socio-economic needs, ensuring access to schools, clinics and economic opportunities. Included in this strategy, the Rural Access Improvement Programme addresses challenges in rural development like the revitalisation of rural railway operations by expanding rail passenger services and freight operations to the rural areas (*ibid*: 523).

In 2010 and 2011, the Department of Transport developed a comprehensive Rail Investment Programme for South Africa's passenger rail system. The aims of the department are to develop rail transport as part of a worldwide rail revitalization, necessitated by rapid urban migration and economic development. Rail transport is identified as the best option for long-distance commuting on a daily basis. (*ibid*: 525)
The rail development plan template has four outcomes:

- urban transit systems
- long-distance transit systems
- key strategic freight corridors
- rural access and mobility.

The above mentioned strategies are potential remedies for problems and conditions in the study area. Urban and rural strategies could play crucial roles in the development of transport and transport architecture in the study area. This peri-urban identity attributed to the study area contributes to the neglected state of the township. It does not function as an urban core that benefits significantly from an internal economy, and it cannot be classified as a rural settlement as the township, as a whole, shows a number of signs of urbanisation. Interviews with locals in the study area indicate a large number of residents still commute to urbanized areas such as Pretoria for economic opportunity.

**Fig_2.02** Taxi's parked on public parking bays **[Author, 2012]**

**Fig_2.03** Abandoned railway trucks litter unused parts of railway tracks **[Author, 2012]**

**Fig_2.04** Abandoned historic railway shop and pedestrian bridge across railway tracks **[Author, 2012]**

**Fig_2.05** Ruins of railway structures on the western side of the railway tracks **[Author, 2012]**

## Hammanskraal Precinct

The Tshwane Status Quo Report (2009: 1) describes the Hammanskraal Commercial Precinct as a multi functional node east from the Hammanskraal Station. A number of taxi and bus facilities connect commuters to central areas of the Pretoria CBD and a rich mix of formal and informal activity, figiure_2.06-07, is present. Formal activity consists mostly of commercial and industrial establishments and informal activity of trade. The precinct is earmarked as a Metropolitan Urban Core (idid) and prominent structuring element in the overall city structure. The underdeveloped area is experiencing urban decay and is a typical example of urban displacement due to its former inclusion in the Bophuthatswana Homeland and turbulent origin.

Even though the precinct can be considered vibrant because of the multitude activities present, it lacks an underlying structure. The lack of order has resulted in neglected and misused areas in terms of their function; i.e. roads become parking space and sidewalks and threshold spaces around buildings are cluttered by informal traders. This exploitation of space has a ripple effect on other functions. Pedestrian circulation on sidewalks has moved into the streets, interfering with traffic movement patterns and contributing to disorientation, illegibility and confusion of the overall spatial perception.

## Hammanskraal Station and surroundings

General lack of respect for public property and abandoned sites, coupled with the rising unemployment rate and moral decline of society, results in much of the countries existing historic railway infrastructure being systematically vandalised.

The railway station on the western edge of the Hammanskraal Commercial Precinct is currently in advance stages of disrepair. Its function as a railway station is seriously diminished, and it currently operates as a liquor store. An underlying criminal culture occupies the station perimeter and takes the form of loitering, drug use and intimidation of locals and tourists. The area connecting the station to the local taxi terminus is unpaved, polluted with rubbish and mainly deserted except for the small groups of unemployed citizens and minor informal trading activities. Historic railway houses along the eastern edge of the railway tracks as seen in figure_2.08, are abandoned and used as storage by the traders and sleeping quarters by vagrants and loiterers.




**Fig_2.06** Informal traders occupy sidewalk space [**Author, 2012**]

**Fig_2.07** Informal and formal trade coexist in close proximity [**Author, 2012**]

**Fig_2.08** The current state of the site between the Hammanskraal station and the Kopanong mall [**Author, 2012**]


fig_2.09


fig_2.10


fig_2.11


fig_2.12

## 2_02 The intended design

The Tshwane Status Quo Report (2009: 4) expresses new local government interest in the Hammanskraal area by proposing that the existing railway station operates as a public commuter line again. This will reestablish a connection between the Hammanskraal, Mabopane and Pretoria stations. The proposal has considerable benefits for the current neglected railway station and commercial precinct.

This dissertation intends to react to the Tshwane government proposal with an objective to revitalise the precinct by redesigning and reintegrating the neglected railway station and its surrounding land, shown in figure_2.09-12, as a major node along the existing railway line and in the community. The design intends to encompass cross programming of rail and road transport services, as well as the incorporation of existing informal trading activities that contribute to the character of the present day surroundings.

The design aims to give recognition to informal trading activities, showcasing their growing importance in present society. Aspiration to succeed within the community is sought with this approach, giving the building social and economic landmark status.

Exciting opportunities are generated when designing for the interaction between transportation, pedestrian and traders. This dissertation intends to enhance these interactions and activate the precinct to create a vibrant and constantly adapting transport and commercial node. This will be achieved by fragmenting the railway station programme and building alike, linked by routes which pass trading stalls and other informal activities.

By providing this reconnection between the study area and the greater Tshwane region, the design will aim to relieve some of the economic hardships of the inhabitants, the commuters, the traders, and the local economy.

Hamdi (2004: xviii) states that for emergence in a community to occur it is better to design a densely interconnected system with basic elements, allowing for more sophisticated organizational and behavioural hierarchies to filter up where the need arises. He elaborates that in order to have a large scale impact on a community, one has to start on a small scale and locate the intervention where it counts the most. Thus, an appropriate, well placed development will ultimately facilitate emergence in the community.

In reaction to Hamdi's statement, the intend is to produce space(s) that would accommodate and encourage complex interactions between social and circulatory behaviour in a simple, recognizable and legible setting. Through the design, the aim is to create visual and spatial indicators as guidelines for future urban development towards a pedestrian oriented environment. The proposed intervention will act as a gateway site due to its location. It is in a prime position to facilitate catalytic growth in the greater Hammanskraal area.

## 2_03 Reconnecting divided townships

A divided city or township is one which, as a consequence of political changes or border shifts, presently constitutes (or once constituted) two separate entities.

**Fig_2.09** North eastern view to Hammanskraal CBD from the railway station.**[Author, 2012]**

**Fig_2.10** Historic railway houses become hot spots for unemployed citizens to gather and informal businesses to operate **[Author, 2012]**

**Fig_2.11** View of pedestrian bridge across railway tracks. Not open to the public anymore **[Author, 2012]**

**Fig_2.12** Shaded areas around historic railway houses are perfectly suited for pedestrian gathering and movement **[Author, 2012]**

In the book *Dividing cities: Belfast, Beirut, Jerusalem, Mostar and Nicosia* (2009), the authors explain the sequence of events that precedes and causes the division within cities and in the case of this dissertation it applies to Hammanskraal and Temba. The first step in this process is the politicisation of ethnicity. When ethnic and political identities merge, competition for the control and management of resources occurs. The spatial manifestation of this process is the creation of ethnically homogeneous areas, as a protective response to inequalities and political pressures (Calame & Charlesworth, 2009).

During the Apartheid regime, the then national government forcefully removed black South Africans from areas within Pretoria and Johannesburg and relocated them to sites like the area where Temba was established Van Huyssteen (2000:7). The consequence of this relocation and separation of groups is a decrease in contact and interaction between groups on a social, political and institutional level.

Calame and Charlesworth (2009) states that after threatened ethnic communities, in South Africa's case the black communities, retreat into homogeneous clusters and urban terrains converted to political territories, the next step in the process is boundary etching. The concretisation of the border is the evolution of ethnic enclaves that become increasingly isolated from each other and formalised on an institutional level: boundaries that were permeable and informal, in the case of Temba the tent town and Mandela Village the squatter settlement, turn into impermeable and stable. The intended emergency and temporary solution of separation become permanent.

With regards to the study area the railway track in fig_2.13, becomes a physical and symbolic barrier between the communities. The boundary is reinforced by the historic political boundary between South Africa and Bophuthatswana. Cultural differences between different wards, where ethnic groups cluster together, is evidence of the remnants of these political divides, as seen in figure_2.14.

The last step in the process is that of adaptation to the division, with consolidation of the situation and the rearrangement of the functioning of the city. This development goes against sound urban practice of shared space and service and manifests as each group claiming ownership of territory, infrastructure and resources, ensuing the doubling of structures needed for proper functioning of a city or town. In the case of Temba, according to Van Huyssteen (2000: 11), the Kekana Chief allowed new settlers the use of tribal infrastructure in exchange for payment.

Calame and Charlesworth (2009) argue that in cases where the barriers or divide were removed (reintegration of Bophuthatswana into South Africa), reunification does not always mean integration, because the physical and social divisions of a city are difficult to overcome. The removal of a boundary or divide is seen as necessary, but not a sufficient condition for reconciliation.

The proposed design aims to provide a shared transport node for all the communities in the area and is situated on the historic divide between the areas. The tracks remind of this fact and through this memory, reconciliation and integration between users and the townships can be promoted.

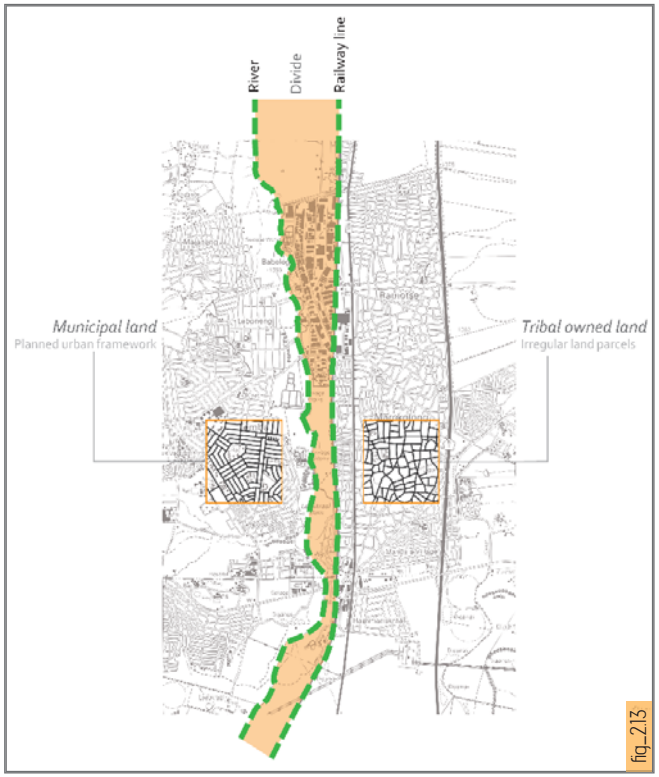




**Fig_2.13** Map illustrating the divide between the more affluent and poorer areas in Hammanskraal. **[Author, 2012]**

**Fig_2.14** Collection of photos that shows the different lifestyles and urban conditions in Hammanskraal **[Author, 2012]**

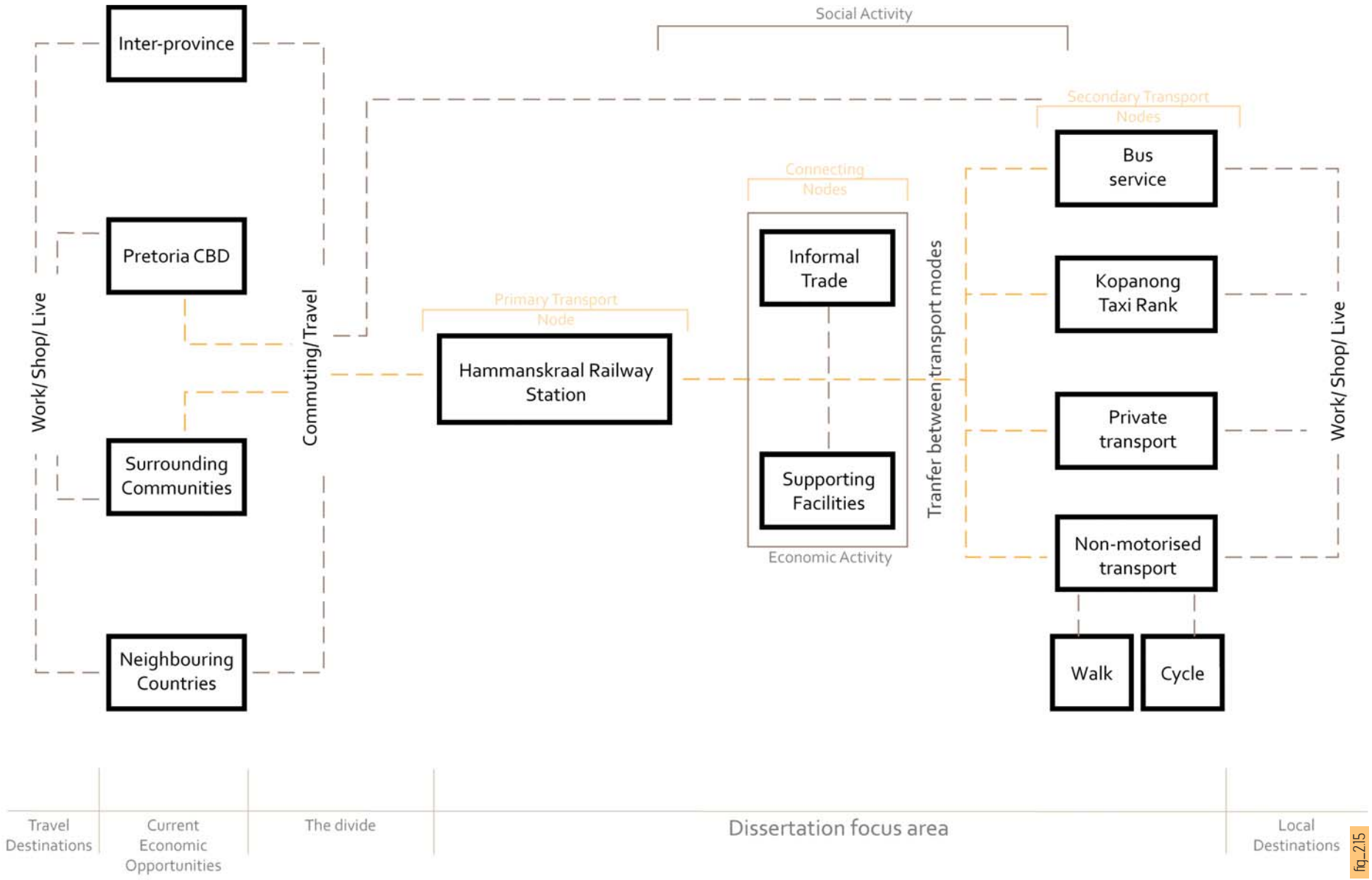



fig_2.15

# 2_04 The client

## Passenger rail agency of South Africa_ PRASA

PRASA is tasked with transforming the country's public transport system. They consist of an amalgamation of state-owned passenger rail entities, a road-based bus passenger carrier and an asset-management entity. They regulate the high standard and low-cost transport services of their business units which include Metrorail, Shosholoza Meyl, Autopax and Intersite.

fig_2.16

## Metrorail_Primary [Passengers]

Metrorail transports up to 2 million passengers daily in Gauteng, Western Cape, KwaZulu-Natal and the Eastern Cape. According to Metrorail (2012), of the 468 stations that Metrorail operates, PRASA owns 317 and Transnet Freight Rail the remaining 151.

fig_2.17

## Transnet Freight Rail_Secondary [Goods]

Freight Rail is the largest division in Transnet and specializes in heavy haul freight transportation. The majority freight transport, to or from the study area, will occur at the Kekana Railway Station, located to the north of the Hammanskraal Station in the Babelegi industrial precinct. While the aim for Hammanskraal station is that of a passenger commuting, provision has to be made for occasional stops by freight trains if the need arises.

fig_2.18

## Local Taxi Associations

Local minibus taxi services, figure_2.20-21, along with the North West Star bus service, have become the backbone of the public transport for the area. By designing with and for these services, a more integrated public transportation network could be created which would serve the community more efficiently. Next to the Hammanskraal station is the main taxi rank, Kopanong, which houses local and interprovincial taxi services.


fig_2.19


fig_2.20


fig_2.21

**Fig_2.15** Diagram showing where dissertation fit into transportation network[**Author, 2012**]
**Fig_2.16** Passenger Railway Agency of South Africa Logo [**www.prasa.com, 2012**]
**Fig_2.17** Metrorail logo [**www.metrorail.co.za, 2012**]
**Fig_2.18** Transnet logo [**www.transnet.net, 2012**]
**Fig_2.19** View of island inbetween railway tracks [**Author, 2012**]
**Fig_2.20** Carwash small business relying on taxi industry [**Author, 2012**]
**Fig_2.21** New taxi rank facilities south east of study site[**Author, 2012**]

fig_2.22

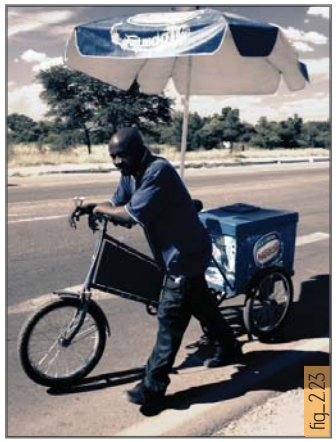


fig_2.23

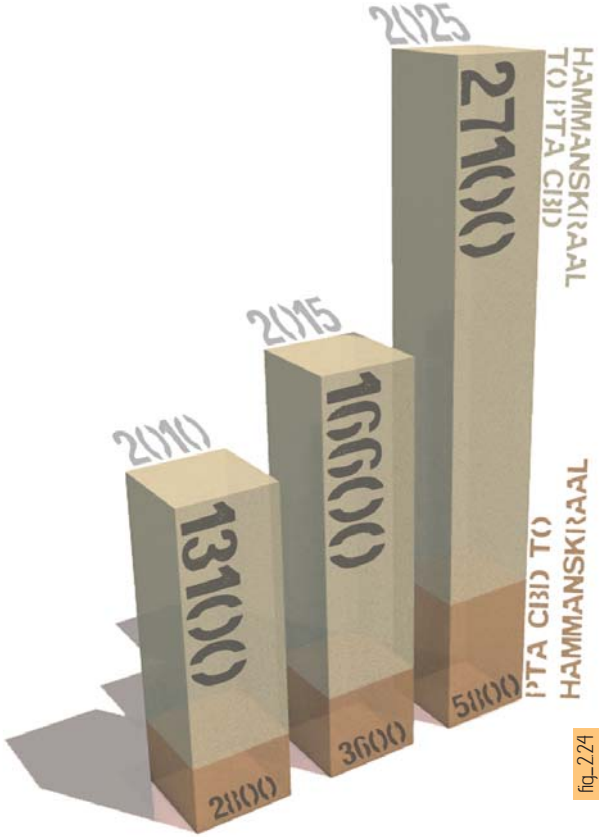


fig_2.24

# 2_05 The user

## Commuters_Distribution and collection

*Train_Proposed*

Railway commuting used to be a vital form of transport in the study area. Interviews with locals have revealed a positive reaction to the idea of reopening the public commuter line to the Hammanskraal railway. Collection, orientation and distribution of commuters will be key design considerations. Figure_2.24 shows the current and predicted commuter numbers between Hammanskraal and the Pretoria CBD.

*Taxi and bus*

Current taxi and bus service are the only forms of public transport available to the public. The intervention proposed in this dissertation will have to address the use of these forms of transport adequately as not to have a negative impact on their role in the community. Inclusion and integration of these services into the project will be a key aspect to address.

*Private_not primarily*

The objective of the design is to promote public transport use as the site is situated within an extremely busy public transport node. The extent of catering for private transport is limited to the collection of travellers, shopping at informal market and service related travel.

## Informal traders_Accommodate

Numerous informal traders surrounding the train station and taxi rank indicate the economic potential of the precinct. Formalization of trade gives the trader and buyer better orientation and structure to conduct business. Low income users make use of these traders for their daily shopping needs. The positioning of informal traders, see figure_2.22-23, is a response to predominant pedestrian movement patterns; therefore, their importance has to be recognized in the design. This encourages interaction between trader and buyer within a larger informal market.

## Unemployed_Opportunity

With the improved connection of the study area to the greater region and the aim of the project to revitalise the commercial precinct, economic opportunities will emerge in the area. During construction, building skills will be transferred to willing unemployed citizens, establishing a sense of pride and ownership among local residents. With job creation prospects in the newly established transit zone, unemployment is addressed to an extent.

## Visitor_Orientation

Hammanskraal railway station intends to become a hub of economic and social activity, within the local community and surrounding areas. By creating commercial progress, both formal and informal, visitors will start frequenting the shopping opportunities in the Hammanskraal CBD and the neighbouring Dinokeng Nature Reserve and Carousel Casino. Orientation becomes a crucial consideration to avoid travellers to the station being confused and lost.

**Fig_2.22** Informal trading is a common occurrence next to roads in Hammanskraal **[Author, 2012]**

**Fig_2.23** Ice cream sales - a form of mobile trade **[Author, 2012]**

**Fig_2.24** Daily passenger numbers between Hammanskraal and the Pretoria CBD. current and predicted **[Olifant, 2012]**

**Fig_2.25** Diagram indicating potential users and clients of the dissertation project **[Author, 2012]**

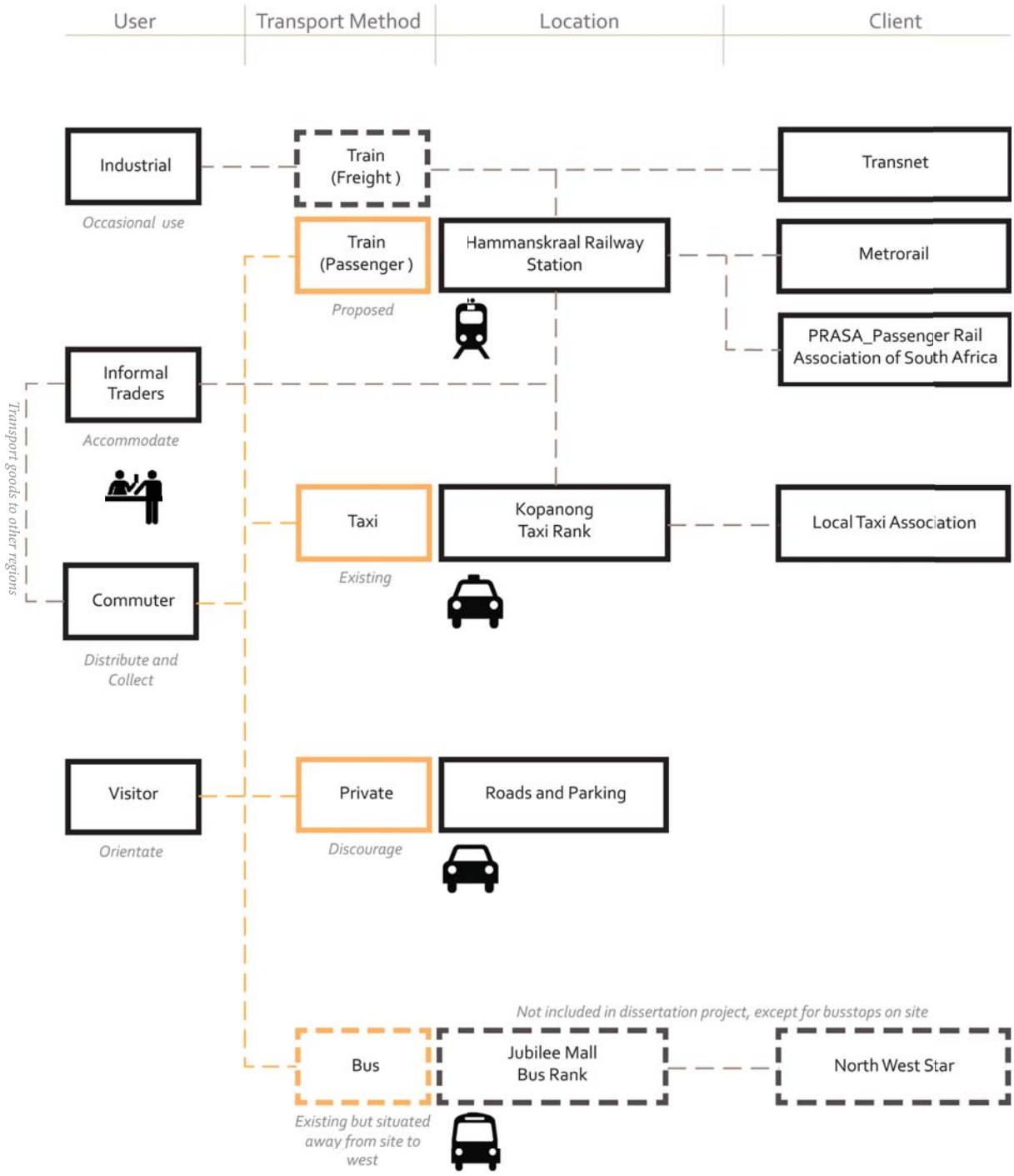
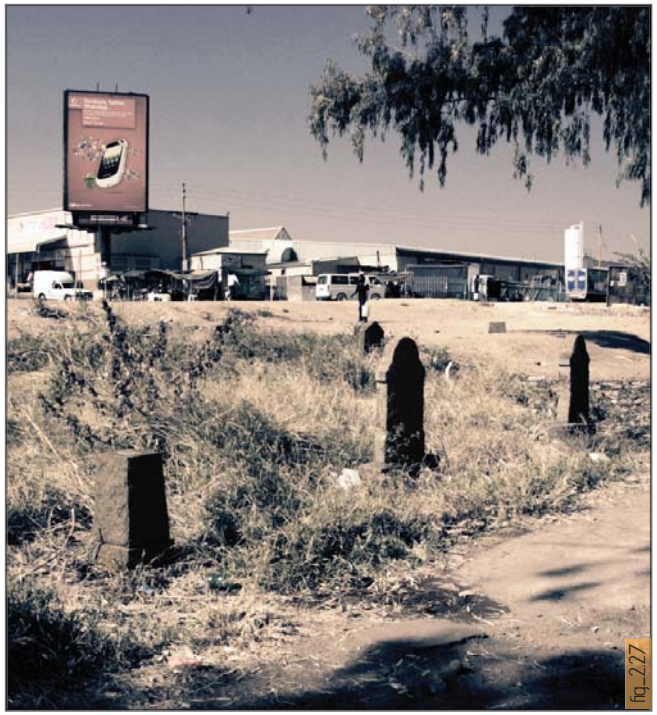



fig_2.25


## 2_06 Statement of heritage significance

In terms of the 1999 National Heritage Resources Act, all buildings older than 60 years are automatically protected. A number of station buildings and other railway structures, figure_2.28, are also formally protected in their own right. This legislation has not prevented vandalism and destruction.

Josias Thabo Pila, journalist at the Kopitori township website, writes that there was a railway station already located in Hammanskraal by the 1920's. It is assumed by the author that, due to a lack of supporting information, the station focused on is the above mentioned station (Pila, 2011).

While the Hammanskraal station, shown in figure_2.26 was a recognized stop along the northern railway route, it was an insignificant station compared to other more prominent stations in the area. (Personal communication, Du Preez, 20 May 2012)

Seeing as the population of Hammanskraal has increased considerably over the last few decades, and recognizing the positive impact the reactivation of the railway station could have on the community, aims are to keep the existing station, which will be integrated as part of the new station-complex.

The spaces around the station intend to function as a gateway to and from the railway tracks, into the new transport interchange and Hammanskraal. Using this approach the station functions as a reminder of the historic origins of the township and aims to reconnect the community both physically and metaphysically to the surrounding towns and cities.

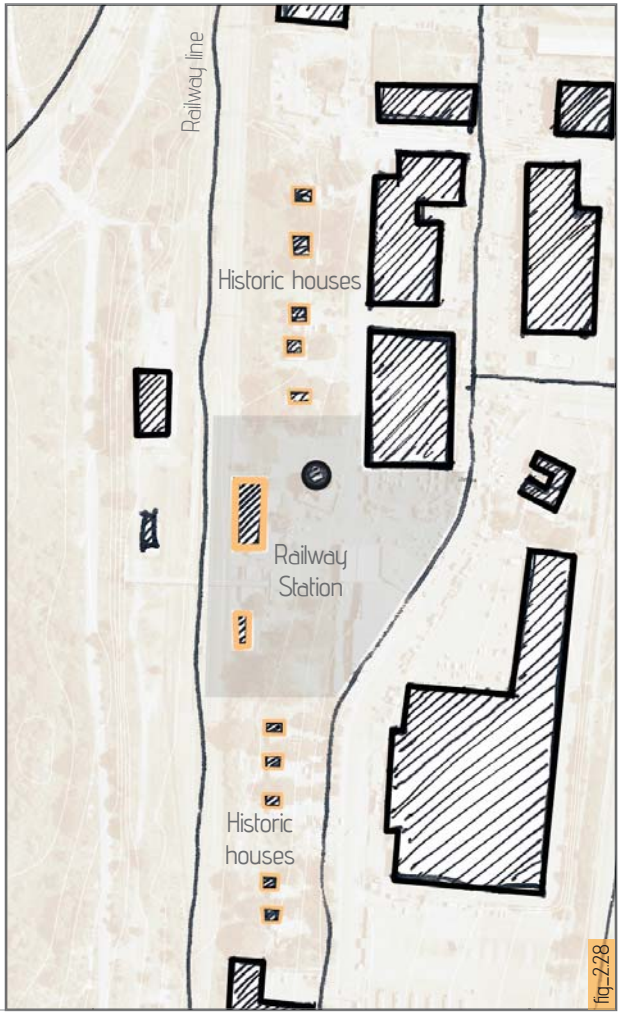



**Fig_2.26** Railway station in its current condition viewed from the railway tracks **[Author, 2012]**

**Fig_2.27** Gravesites located on the study site east from the railway station **[Author, 2012]**

**Fig_2.28** Map indicating heritage structures in and around the study site **[Author, 2012]**

## 2_07 Objectives of study

- Provide a platform for informal trade within publicly accessible spaces
- Further integration of commercial node into urban fabric
- The transformation of a transport interchange into civic terminus
- Reconnection of township to CBD with re-establishing railway travel as a transport option
- Access to key services at reasonable cost, within a reasonable time and with reasonable ease

"Certain interventions can transform the current facilities into havens of dignified transport service provision which maintain safe and relaxed surroundings. People must be able to change modes of transport with ease and in an orderly fashion, purchase groceries and/or other items, carry out scheduled meetings with family members/ associates/ colleagues and most importantly transport interchanges must relieve the daily stresses associated with commuting for extended hours"

**Tshwane Regional Spatial Development Framework, North Eastern Region (2007: 15)**

## 2_08 Limitations

- Access to certain areas of the site is problematic and dangerous due to the lack of integration between the railway station and the rest of the Hammanskraal business district and the larger community.
- In terms of the proposed programme, taxi and bus services might have a negative reaction to the cheaper competition made available to the public.
- Lack of historic information on the site, hinders informed design decision making in terms of heritage considerations with regard to the train station building, railway houses and surrounding sub structures.

## 2_09 Limitations and exclusions from transport generated activities

- *Physical exclusion*

Physical barriers to access of transport and other services, shown in figure_2.29, are road barriers as solid lines and railway as dotted.

- *Geographical exclusion*

The lack of transportation services in the geographic location, in which the user resides, inhibits the user to participate in main stream socio-economic activities.

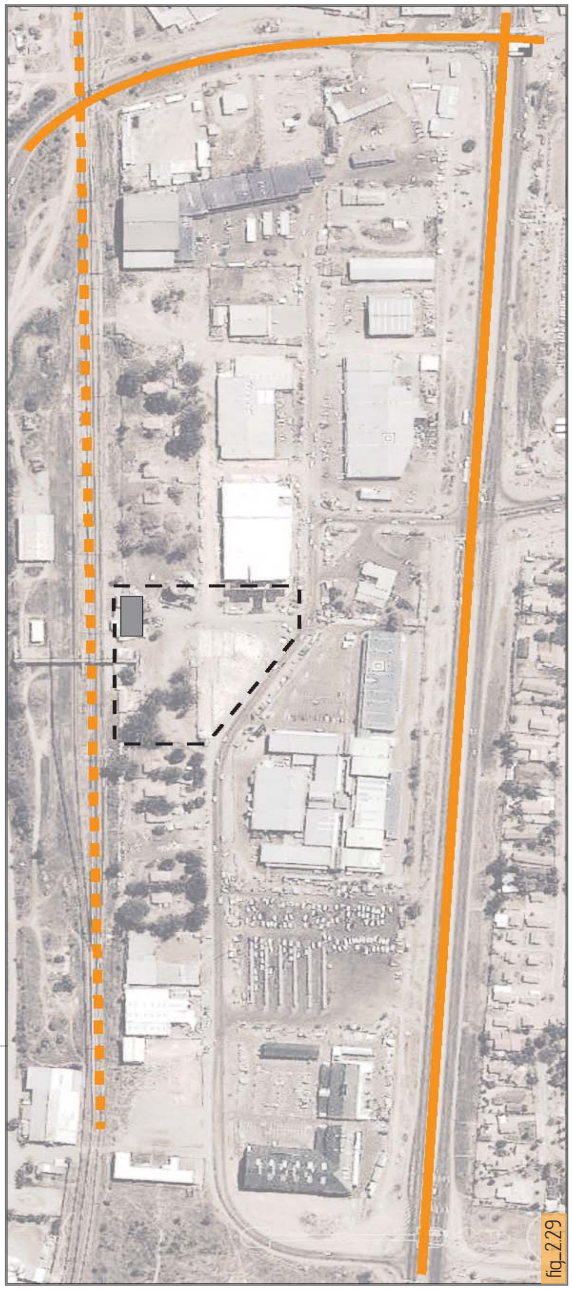



**Fig_2.29** Map indicating major physical boundaries around the site, consisting of busy vehicular routes and the railway line **[Author, 2012]**

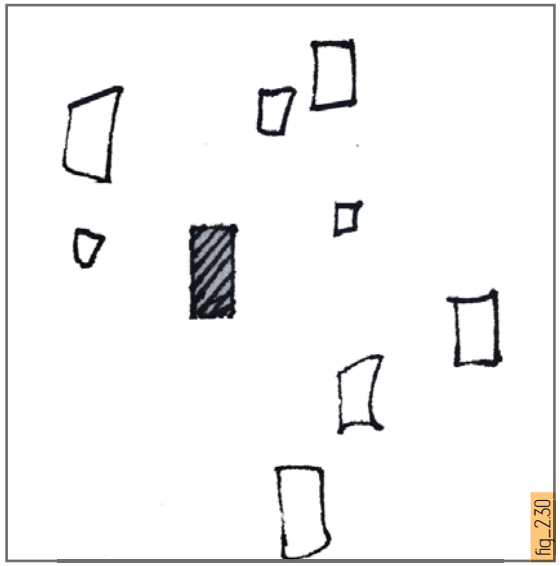


fig_2.30

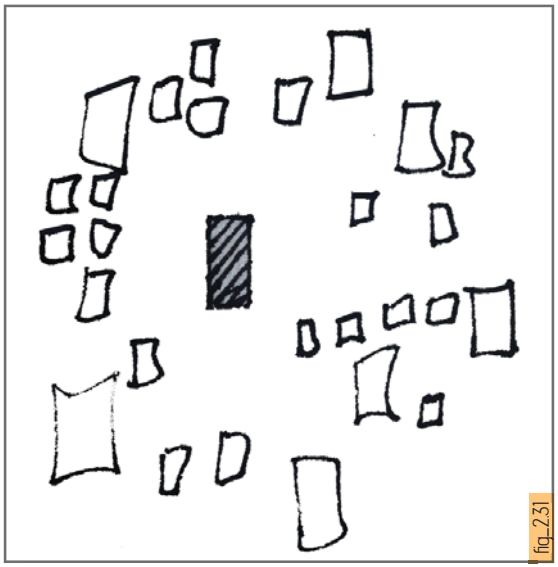


fig_2.31

- *Exclusion from facilities*

The lack of transportation service, leads to lack of facility access, which reinforces poverty cycles. Figure_2.30-31 illustrates the availability of services when in proximity of a key transportation node.

- *Economic exclusion*

The inability to afford public transportation costs can lead to the inability to travel and in turn leads to lack of access to transport and further exclusion from socio-economic opportunities.

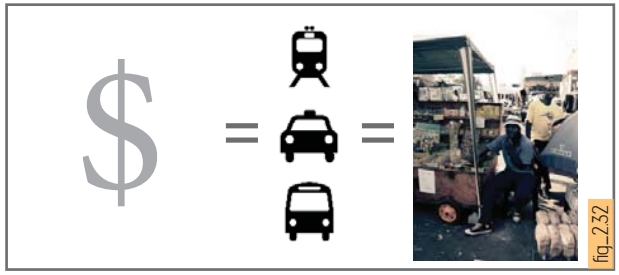


fig_2.32

- *Time-based exclusion*

Time constraints in the form of the amount of time a trip takes or the time of day or night a traveller need to travel could exclude users from transport and other activities.

- *Fear-based exclusion*

There exists exclusion of transport, and consequently, activities requiring travel because of fear of using transport. This can be because of taxi wars, labour action, poor public transport designs or gender targeted sexual harassment in specific transport modes (Chakwizira, 2009: 3).

## 2_10 Summary

Access to economic, social, cultural and recreational benefits result from the agglomeration of people. In order to facilitate access, the intensification of settlements is required, along with the generation of opportunities for a greater range of activities and choices promoting more complex levels of spatial order. Providing a platform for social activity and interaction, coupled with needed transport and trading infrastructure results in a building typology that is socially, economically and environmentally responsive. This typology is catalytic in nature as it generates the required influx of activity needed to uplift a struggling community.

**Fig_2.30 - 31** Diagrammes explaining the impact a transport facility could have on its surroundings in terms of development of economic opportunities **[Author, 2012]**

**Fig_2.32** Diagramme explaining that money is needed to use public transport and public transport benefits and facilitates informal trading activity **[Author, 2012]**

**Fig_2.33** Typical informal trading stall located within the taxi rank **[Author, 2012]**


fig_233

"Because of this nodal nature of transportation terminals, and also their function as collective gateways, they demand to be made as bold, memorable places. In consequence of that they can become major structuring elements in the city"
**Cooke (2012: 1)**


fig_301

# Chapter 3
# Theoretical Investigation



The theoretical investigation in this chapter focuses on aspects of negatively perceived spaces due to neglect and dereliction; what the role of transport and transport architecture could be in redesigning these spaces; and how architecture could guide social interaction within these spaces through planned and unplanned interaction between programmes and role players.

Roger Trancik's theory of lost space, discussed in his book, *Finding lost space* (1986), is studied because it relates to a large extent to conditions and activities found at the Hammanskraal Station site. Furthermore to build on his theory that these spaces have vast amounts of untapped potential, Rem Koolhaas' usage of social condensers in space making is investigated. In the project, this mechanism is used to attract and feed off the energy of pedestrian energy, thereby activating the vacant space.

Transport as a connector and catalyst is discussed and investigated as a means to achieve the social cohesion and socio-economic energy needed for future development in the Hammanskraal commercial precinct.

**Fig_3.01** An object in the enviroment sparks new activities, illustrated by the TLB becoming a playground **[Author, 2012]**





## 3_01 Invisible Spaces

Abandoned sites, sites out of mind and neglected sites are familiar sights for many city residents. These sites are more often than not, the edges and leftover spaces, where the urban and architectural scales and uses meet. Social and economic divisions manifest on these sites, as are visible on the Hammanskraal railway station site, figures. Spaces like these are rarely considered worthy of any design attention (Crisman, 2010: 1).

Roger Trancik defines lost space as the underused and deteriorating residual space between districts. These spaces have the potential to reshape an urban centre to draw in human activity in order to counter urban sprawl. These spaces are usually ill-defined, without measurable boundaries and fail to connect elements in a coherent manner, but have remarkable design opportunities for urban redevelopment (Trancik, 1986: 2-4).

This dissertations' site can be classified as a lost space because of the following reasons: It is bordered by pedestrian flow with limited cross circulation of movement, giving it a static atmosphere; it can be considered a no-man's-land along the railway, see figure, and is in need of maintenance; it is a forgotten railway related site and was vacated in favour of newer automobile technologies in the form of busses and taxies; finally it can be considered a residual boundary site between districts. In the case of Hammanskraal, the site is situated between commercial, industrial, natural and residential districts.

Trancik (1986: 1) explains that because of suburbanization of cities, industry and people migrated to the periphery of the urban areas, thus causing the previous economic and socially viable cores to become deserted. With the advent of the taxi industry, the discontinued Hammanskraal railway station experienced desertion, which expanded into the nearby surroundings. This disconnection of the site causes disruption in the continuity of the city form, fragmenting spaces and land use zones and serves pedestrian links between areas. With this phenomenon, the experience while walking through these spaces becomes disjointed and disorienting.

The unused space around the station functions as spaces for unemployed locals to gather. This attracts criminal activities and drug users, who are in search of neglected spaces where they can effectively become invisible. Because of these activities, the locals deem the area dangerous and avoid it, contributing to a neglected state.

A shift in public perception towards habitation of these unused sites with dense, integrative and sustainable urban infill is a potent alternative to urban sprawl and decentralization. Trancik (1986: 2) suggests that these spaces should be filled with buildings within a framework of interconnected, open space opportunities.

> Ugly, ordinary and out of the way, they present difficult existing conditions and unglamorous realities. **(Crisman, 2010: 1)**

**Fig_3.02** Western facade of the old railway station **[Author, 2012]**

**Fig_3.03** Railway tracks and transformer building west of the study site **[Author, 2012]**

**Fig_3.04** View of the railway station and study site from the pedestrian bridge **[Author, 2012]**

**Fig_3.05** Historic warehouse south of the railway station, which is proposed to become the public laundry in the dissertation project **[Author, 2012]**

## 3_02 Influencing social order and behaviour in architectural space

Henri Lefebvre (1991: 40) in his book, *The Production of Space*, classifies three interlinked forms of space:

- *Perceived space* is that which is generated and used, therefore the physical form.
- *Conceived space* is a mental construct; the abstraction of space through maps, mathematics, plans and logic.
- *Lived space* is socially produced and modified over time and through its use; it is the space of symbolism, meaning and occupation.

Construction of lived or social space, as describe by Lefebvre (1991: 13) occurs in both the mental and physical realm, where real and abstract are linked through human activities over time.

The notion of social condensers according to Bradley Braun (2007: 13), University of Calgary, is rooted in the hypothesis that architecture can be charged with the capacity to influence social behaviour through spatial interventions in the public realm. As this idea evolved in contemporary architectural theory, two concepts manifested:

- Embracing space, time and movement as a conceptual approach for (re)organizing space.

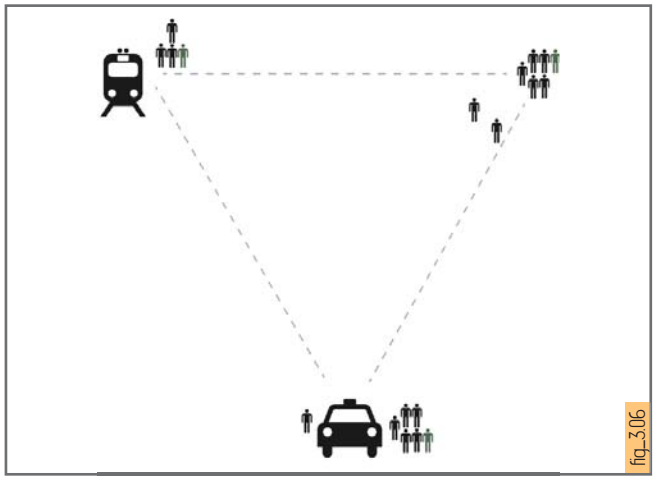
- Architecture as a dynamic form; charged with reacting to constant evolving social dynamic rather than bearing the iconography of the present.

Architecture becomes the facilitator of possibilities, as opposed to the inscriber of social change.

In his book, *Content*, Koolhaas (2004: 72) describes the process of designing a social condenser as the "programmatic layering upon vacant terrain to encourage dynamic coexistence of activities and to generate through their interference, unprecedented events".

In buildings, as described by Koolhaas and Bruce Mau in the books *Delirious New York* (1978) and *S, ML, L, XL* (1995), social condensers are expressed as the intentional overlapping and intersection of programs with circulation flows to facilitate the creation of nodes where otherwise contrasting social communities will interact. Nodes could be described as points of interaction where diverse role players, schedules and programs are brought into collision. Programmes and circulation has to be viewed as flexible and dynamic in order to facilitate the creation of new patterns, circulation and social fields.

The public nature of the intervention and the dynamic transport and social programmes dealt with in the dissertation lends itself to the inclusion of social condensers. Transport architecture and interchanges rely considerably on concepts of circulation, the temporal events of arriving and departing and the social interaction between travellers. These ingredients can be enhanced with the application of social condenser concepts. Unexpected events and social behaviour, as well as new forms of spatial usage and circulation, can manifest and add richness to an already potential memorable experience. This concept is illustrated in figurers and 3.07.





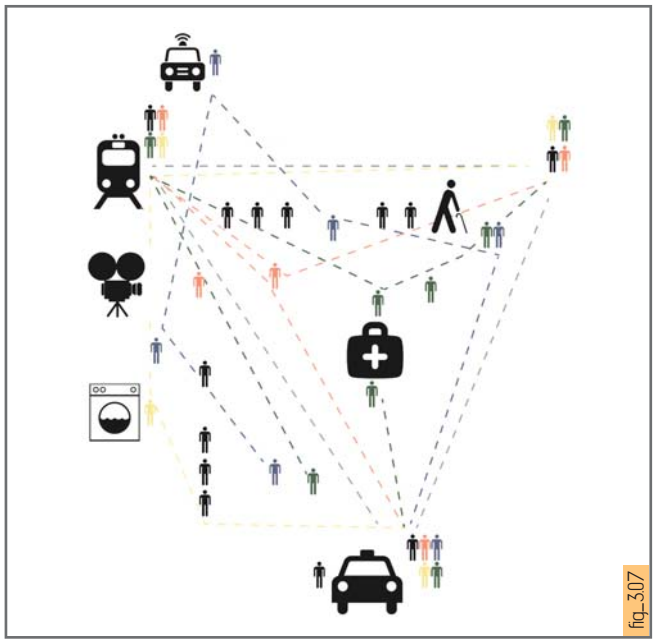



**Fig_3.06** The current state of linked activities in and the around the study site located at the railway station. The CBD, station and taxi rank forms three potential nodes **[Author, 2012]**

**Fig_3.07** Integration of more needed programmes, result in a more diverse and vibrant site **[Author, 2012]**


"[L]ived space is not just a passive stage on which social life unfolds, but represents a constituent element of social life. Therefore, social relations and lived space are inescapably hinged together in everyday life"
**Purcell (2002: 102)**

Architectural practice deals with the creation of conceived space and this space becomes the product of a design, the articulation and representation of space by the designer. Braun (2007: 15) suggests an objective and subjective approach to the design of space that wish to utilize social condensers to add meaning to a spatial experience. This approach recognizes and responds to the dynamic nature of human interaction that defines space.

Through the design response in this dissertation, the objective is to merge the programmatic intent of the conceived space with the lived/social space of the inhabitants. The spatial response will have the capacity to be reconceived by the user rather than function as a vehicle of intervention between user, the city and public space.

"[W]e can make a distinction between the physical and social aspects of the city, but we need to see them as interrelated and interdependent; in other words seeing the city as a socio-spatial phenomenon. In a sense, the idea of a complete separation between physical and social aspects of the urban space can be comparable to what is termed Cartesian dualism, the idea that body and mind are completely separate."
**Madanipour (2005: 8)**

**Fig_3.08** Image of U-Bahn Antigone- a performance inspired by the socio-spatial specifics of the Berlin U-Bahn. Described by the artsists, Das Ist Doch Keine Art!, the physical organization of space imposes a particular logic and produces norms, docility and conduct of everyday life. **[www.mpa-b.org, 2012]**

## 3_03 Transport architecture as connector and catalyst

"A simple truth is that a modern developed economy cannot be built on a large number of people living just above the poverty line, producing agricultural products alone and cut off from the rest of the manufacturing and business centres. This means that every production centre in the country should have speedy economic activity with other parts of the country"
**Kalam (2002: 217-218)**

### Transport architecture as a socio-economic connector

Bart Lootsma, historian, critic and Professor of Architectural Theory at the Leopold-Franzens University in Innsbruck, explains the impact that globalization and individualization has on the production of space within architecture and urbanism means that people are becoming less rooted. Today people belong less to a single community than in numerous networks of care and involvement. This produces uncertainty among individuals whose new freedom of organization brings with it a far greater risk of isolation than existed in more closed communities (Lootsma, 2009: 6).

James Chakwizira (2009: 1), a senior researcher at the Built Environment department of the CSIR, elaborates on the importance of social interaction by explaining that with a lack of access and mobility, people fail to break out of a cycle of social exclusion. For this reason, in urban as well as rural

settings; social dimensions are serious concerns for sustainable mobility and communities.

Chakwizira also argues that transport in itself is not an end to a means, but much rather a means to more ends, indicating the power of transport developments to unlock potential industries and activities and act as a catalyst to its surroundings. In the Hammanskraal commercial precinct, where the presence of the train station previously sparked commercial development and social interaction, this potential lies dormant.

The opposite consequences are also visible as the closure of the public commuter line, contributes to the once safer surroundings of the train station being neglected, forgotten and criminalized. Neglected and dangerous areas breed wariness from local inhabitants and visitors alike and in turn leave the spaces isolated, avoided and decaying.

Sustainable transport and mobility is underpinned by three values and principles according to Chakwizira (2009: 2):

1. *Transport equity principle and value*

This principle ensures that the socio-economic benefits emanating from transport interventions are inclusive in meeting the needs of all areas of the society. Particular emphasize is placed on those with unique needs such as the elderly, youths, children, disabled, women, those without private transport and those living in impoverished areas.

2. *Accessibility principle and value*

Defined as the ease with which one reaches ones destination. This principle is mostly geared towards the resident, with regard to access to activities such as employment, shopping and leisure. The importance of such a principle is reflected in the need of employment opportunities in the Hammanskraal area and its surroundings. According to the 2001 Census, 54% of people residing in the northern part of north east Tshwane, which includes Hammanskraal, are unemployed (Tshwane Regional Spatial Development Framework, North Eastern Region, 2007: 24).

3. *Accessibility vs. Mobility*

Mobility can be defined as physical movement between nodes or activities and can be provided by means of walking, cycling and public and private transport, whereas accessibility is the availability of options and choices present to the traveller. Accessibility is increased with the clustering of activities in and around transport nodes, along with the choice of different travel options. This concept is illustrated in figure_3.09.

The Hammanskraal precinct with regards to sustainability and effectiveness can be considered highly mobile, but its full accessibility potential has not been reached. Currently public road transport is its only choice for travelling distances greater than comfortable walking and cycling distances. The area itself is particularly harsh, confusing and chaotic and does not provide safe and accessible movement options for the disabled or disadvantaged users, other than vehicular transport.

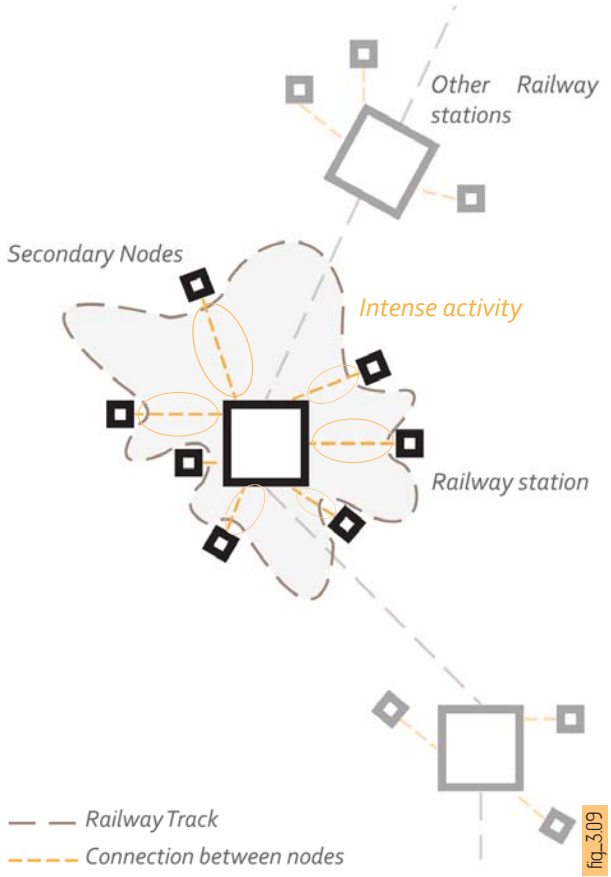



**Fig_3.09** The placement of secondary nodes around a major transport node facilitates increased socio-economic activity within the vicinity of these points of interest **[Author, 2012]**

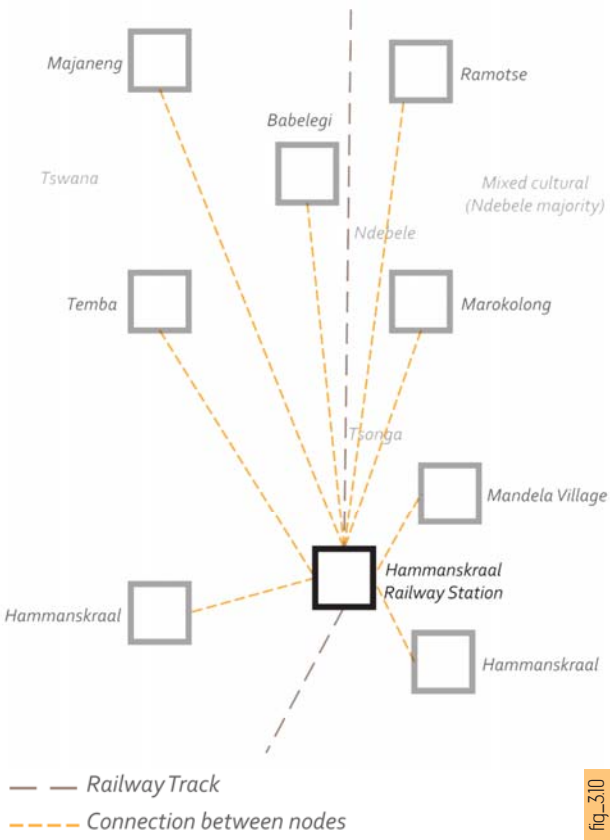



fig_3.10

## Transport architecture as a socio-cultural connector

The Australian Burra Charter (1999: 1) defines the function of cultural significant places as the enrichment of people's lives through the providing of a deep sense of connection to their community and surroundings as well as to the past and memories. These places are historical records that are important, tangible expressions of a community's identity and experience. Places of cultural significance reflect the diversity of communities, telling us about their heritage and historic identity.

In a South African context, architectural heritage is bound to the socio-political aspiration of the country's multiethnic population, reinforcing its complexity and its cultural wealth (Joubert, 2009: 8). Because of its diversity the heritage of all South African ethnic groups should be protected and celebrated where its possible and appropriate.

Cultural significance is embodied in the fabric, setting, use, associations, meanings and related spaces of a place itself. These places have different meanings and values for different groups of people. It is because of these diverse values and importance that different communities attribute to a place that can give it a catalytic quality. This quality can be harnessed to connect and integrate cultures together, into a more collaborative and collective community.

Urbanization and the problems ascribed to it, specifically urban sprawl and decentralization of cities, leave people disconnected from a sense of community and economic opportunities as explained by Lootsma (2009: 6). Individuals and communities alike are confronted with numerous choices in present day life. The wealthy and well educated are often given more choices and economic freedom. The impoverished are forced to be torn away from their traditions, families and communities due to economic deprivation, forcing them to living an almost nomadic existence in search of livelihood.

The Hammanskraal railway station played a role in the urban sprawl of Pretoria by means of connecting the community to Pretoria with a reliable mode of transport, namely commuter trains. Figure_3.10 illustrates the connection the dissertation site has to all the wards in Hammanskraal and how they are linked to Pretoria via the railway line. This made Hammanskraal a preferred residential location, especially for disadvantaged demographics, because of the easily accessible economic market, now within reach.

It is because of this fact that the old Hammanskraal railway station holds, within its culturally significant heritage, the potential to reunite and reconnect cultures represented in the Hammanskraal community.

## Transport architecture as a spatial connector

**Fig_3.10** Diagramme illustrating the central location of the dissertation study area around the old Hammanskraal railway station [**Author, 2012**]

The old Hammanskraal railway station is separated from the rest of the commercial district by an open space of unused land, shown if figure_3.11. Any attempt to integrate the station back into the precinct and the larger community will have to make use of this stretch of land. The land parcel is large enough to facilitate a number of different programmes and in terms of this dissertation various options will be reviewed. These include a public square, market space (both informal and formal), cross over space for modal interchange and public park.

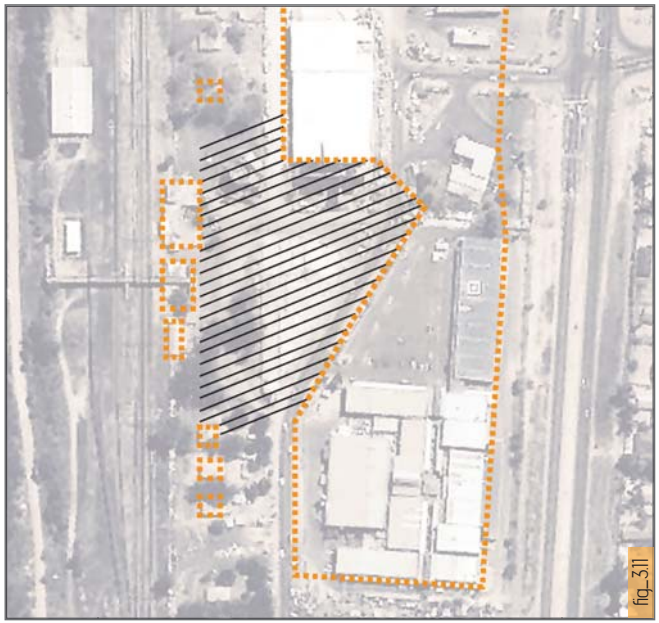
Frances Ching (1979: 202) describes the organization of two spaces linked by a common space. In the case of this dissertation, these spaces will constitute the train station and the existing taxi rank and shopping complex. He explains that two spaces that are separated by distance can be connected by a third, intermediate space. The relationship between these two spaces will depend on the nature of the third. In order to express its linking function, the intermediate space can differ in form and orientation from the other two.

If the space is large enough, which is the case in the study area, it can become the dominant space between the two, or at least more dominant than one of the spaces. With such a large space, its capability of organizing space can include a number of spaces. There are a lot of existing buildings and focus points around the old Hammanskraal railway station. A spatial organisation tool like a communal connection space can start to organize the surroundings. See figure_3.12.

In order for the new intervention to be able to reach into the community within the constraints of a site, an organisation tool is needed to imply connections. Ching (1979: 224) describes a radial organization of space as a combination between linear and central organization. Radial organization differs from centralized organization in term of its spatial focus. Where the latter focuses on the core or internal, the former reaches outward into the context. Radial consists of linear connecting arms which extend and connect to multiple elements or focus points of a site.

Kisho Kurokawa in his book I*ntercultural architecture, the philosophy of Symbiosis* (1991: 107-108) explains how the concept of symbiosis between to opposite spaces can be applied to a connection space. He argues that in western society designers tend to resolve intermediate spaces in terms of a hierarchical structure. Two opposite spaces are connected by a third and are either merged into a single entity, or one is neglected or rejected in favour of the other. Kurokawas' concept of symbiosis creates a dynamic relationship between the two spaces while still allowing them to remain two opposite entities.

Kurokawa (*ibid*) argues that spatial or temporal distance can be utilized to achieve this desired relationship. Western society usually perceives these spaces as negative or undesirable. At the moment, the space separating the Hammanskraal railway station from the commercial core is a negative and neglected space. Through this dissertation, the author's intent is to create a space, connecting the two entities and integrating them with each other while providing a spatial separation that contribute to the urban well being and needs of the community.



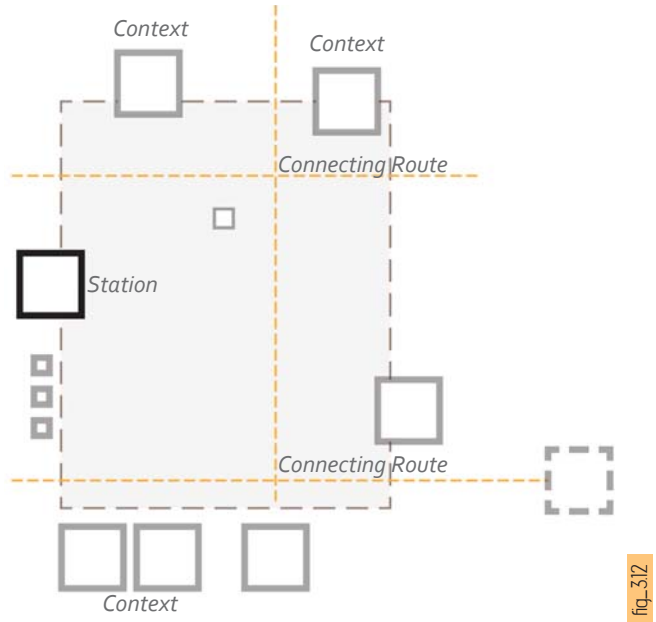




**Fig_3.11** Map showing the open space connecting the railway station with current heart of the Hammanskraal CBD [**Author, 2012**]

**Fig_3.12** Diagramme illustrating how the placement of programmes around the railway station can begin to create space and indicate routes [**Author, 2012**]

fig_3.13

**Fig_3.13** Conceptual sketch of pedestrian and vehicular interaction [**Author, 2012**]

**Fig_3.14** Collage illustrating a vibrant and mixed use transport node [**Author, 2012**]


fig_3.13

fig_4.01

# Chapter 4
# Precedent Studies



Bridge City is chosen as an urban design precedent as it showcases a majority of the characteristics such as accessibility and mobility for local residents and catalytic urban growth, that the author wants this dissertation to achieve.

The Baragwanath Interchange makes a bold statement in the formalizing of the taxi and informal trading industries. It is a unassuming and robust structure which facilitates the changing nature of transport and trade related programmes.

Kuyasa Interchange is located within the township Khayelitsha; with programmes supporting the railway station nearby and its layout and function resembles a civic square, which is a characteristic intended for this dissertation.

The Philippi Interchange exhibits ranges from strong, everyday solutions to complex socio-economic environments.

This precedent in Portugal showcases unadorned lines and legibility, along with a transparent quality. The public space in front of the station compliments the project. For these qualities, the project is chosen as a precedent.

# 4_01 Bridge city
## _Durban, South Africa


fig_ 4.02

Bridge CIty location

Location
_Durban, South Africa
Type
_Urban development
Scale
_Large, inter community
Client
_eThekwini Municipality
Date of Completion
_In Progress
Designer/s or Developer
_Axis Mason

Bridge City is a new town centre about 17 kilometres from the Durban CBD and links the communities of Phoenix and Inanda, Ntuzuma and KwaMashu into the urban system. This new town will serve as the social and commercial centre to an area housing a population of over 800 000 people. At present these areas have poor access to facilities and social services.

According to the Bridge City Investment Brochure (2012:10) the role the development will play in reshaping the Durban region is:

- Integrating communities
- Unlocking opportunities
- Create fundamental change in the perceptions of South African townships
- Create a sustainable catalyst for social and economic development
- Empowerment of surrounding communities by improving their access to public transport and opportunities to work, travel, shop and do business within the area
- Create opportunities for ownership and economic entry at all levels
- Create symbiotic relationship between private and public sectors, particularly in the area of transport

The aims for urban characteristics for this dissertation are also manifested in this development and are as follows:

- Mixed-use development
- Higher density
- High aesthetic standard
- Vibrant, dynamic and balanced
- Well-maintained and safe urban spaces
- Pedestrian friendly surroundings which include open squares and parks
- Walking distance planning to minimise vehicle use (refer to Urban Framework Chapter)
- Well designed public spaces
- Entertainment sites including restaurants and venues acting as economic catalyst and drawing more people to the site (Bridge City Investment Brochure, 2012: 12)

The town layout rests upon the essence of easy and effective access to public transport and promotes pedestrian travel over that of private vehicles. The inclusion of a multimodal transport station as the main public transport focus point categorises this development as a relevant precedent for any future public transport orientated developments. Even though, this is not an architectural typological precedent, it is an appropriate urban design guideline study, which encompassed not only tried and trusted urban design principles, but also gives insight into what the future of South African townships could look like.

"Bridge City will most certainly become a catalyst for growth and development and its ripples will spread wide across the community, creating development and investment opportunities"
**Obed Mlaba, Mayor of eThekwini Municipality (www.bridgecity.co.za: 2012)**

**Fig_4.01** Ladies carrying umbrellas on their way to church **[Author, 2012]**

**Fig_4.02** Map indicating the location of Bridge City **[www.bridgecity.co.za]**

**Fig_4.03** Plan of Bridge City **[www.bridgecity.co.za]**

**Fig_4.04** 3D representation of Bridge City **[www.bridgecity.co.za]**


fig_4.03

fig_4.04

- Precinct 1
  Regional Hospital. Ithala Mixed-use (Retail & Residential), Magistrates Court

- Precinct 2
  Motor City, Mixed-use (Retail & Residential), Corporate Offices

- Precinct 3
  SMME cluster, Government Mall

- Precinct 4
  Shopping Centre (Retail & Residential), Inter-modal Facility (Railway Station, Taxi & Bus Terminal)

# 4_02 Baragwanath Transport Interchange and Traders Market

_Johannesburg, South Africa

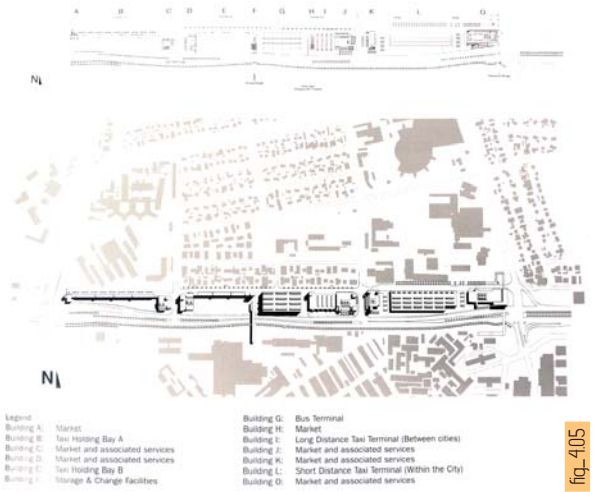



fig_405

Location
_Soweto, South Africa
Type
_Urban Public Facility
Scale
_Urban, Public
Client
_City of Johannesburg
Date of Completion
_2008
Designer/s or Developer
_Urban Solutions Architects and Urban Designers

## Context/Integration

The Greater Johannesburg Metropolitan Council's Baralink Development Framework, which includes the Baragwanath Transport Interchange and Traders Markets, was established to integrate the Greater Soweto with Johannesburg and strengthen the importance of this gateway into Soweto. The interchange is situated across, a high order road, from the largest hospital in South Africa, the Chris Hani Baragwanath Hospital, and is considered one of the busiest transport nodes in South Africa (Digest of South African Architecture, 2008: 22-23).

## Function of building

The brief from the Metropolitan Trading Company, which was established to manage trader markets and transport facilities in the greater Johannesburg area, asked for a functionally efficient transport node that integrated street traders in a structure that would also act as a gateway into Soweto.

In the past, remarkably little formal facilities were provided by cities for the informal trading sector as well as the marginalized minibus taxi industry. This included a lack of public amenities and supporting structures (*ibid*).

The Baragwanath Interchange provides accommodation for around 500 street traders with supporting facilities, such as storage, washing areas, management offices and well defined circulation paths. These trading provisions are divided into different stall typologies to accommodate diverse trader types. Formal enclosed shops provide for more permanent trading activities, such as fast food stalls, hair dressers and curios. Perishable trading items such as fruit, vegetables and other food types are provided for in structured but open environments along circulation paths to maximise engagement with the community and commuters.

Apart from formalising informal trading activity, the main aim of the development is the structuring and management of the bus and taxi industries in the area. The project includes 20 bus ranking facilities and approximately 800 ranking and holding bays for the 12 taxi operators (*ibid*).

The interchange functions along a structural spine along the length of the site. Various programmes and functions feed off the circulation energy generated along the route. This spine manifests in the form of an arcade, which pedestrians use to circulate between public facilities and transport stations. The positioning of traders and public facilities along the spine gives it prominence and establishes it as the focal point of the development.

Orientation along the route is provided by the inclusion of landmark structures, height differences at main entrances and local artwork.

## Construction_Tectonics of building

In contrast to the lightweight tectonics of steel and glazing, usually associated with transport and trading facilities in South Africa, according to the Digest of South African Architecture (*ibid*), the entire building was constructed with heavy materials such as masonry and concrete.

Concrete elements were used both structurally and functionally to provide shelter and at the same time orients the different functions of the building in a legible, organized fashion.

**Fig_4.05** Plan of Baragwanath Interchange **[Digest of South African Architecture, 2008:22]**

**Fig_4.06** Formal trader stall **[Author, 2012]**
**Fig_4.07** Atrium of trader complex**[Author, 2012]**
**Fig_4.08** Public water point **[Author, 2012]**

**Fig_4.09** Fast food stall **[Author, 2012]**
**Fig_4.10** Main pedestrian colonnade running the length of the building **[Author, 2012]**
**Fig_4.11** Concrete used to create a robust and heavy duty environment **[Author, 2012]**
**Fig_4.12** One of the nodal points along the route functions as an outdoor

Organization is achieved through the interplay between solid and void on facades, with strategic openings allowing views of the transport modes and the surroundings at all times.

By utilizing simple, recognizable materials and geometries, legibility is achieved in a building with a constantly fluctuating program. The material use allows for a robust and low maintenance structure that recognizes the transient nature of its programme and the need for hard wearing finishes in a public setting.

A heavy tectonic language was chosen to give the sense of permanence to the structure, emphasizing its importance within the community. Informal trading and the taxi industries are recognized as integral parts in a contemporary South African society, by this material expression.

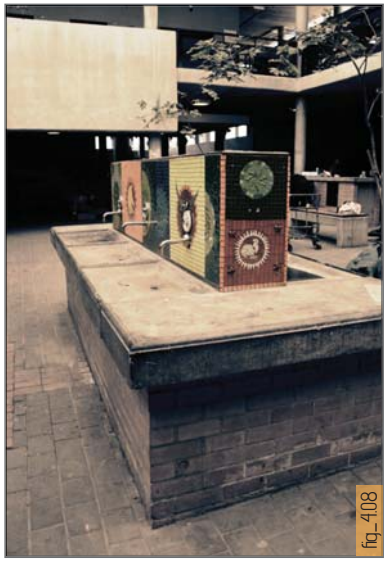


fig_408


fig_410


fig_411


fig_406


fig_407


fig_409


fig_412

# 4_03 Kuyasa Transport Interchange

## _Khayelitsha, Cape Town, South Africa

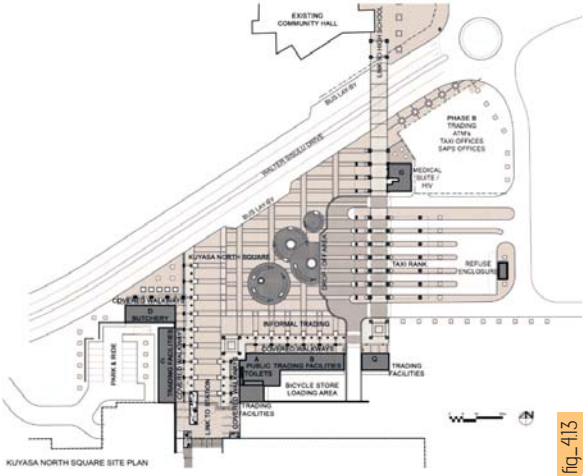



fig_4.13

"In an area where dire poverty is prevalent and the quality of life of residents is poor, the objective of the project was to create a vibrant, integrated urban environment where the broader urban needs of public transport users and more specifically pedestrians were to take precedence."
Victoria King [www. archdaily.com]

Location
_Cape Town, South Africa
Type
_Urban Public Transport Facility
Scale
_Urban, Public
Client
_City of Cape Town
Date of Completion
_2009
Designer/s or Developer
_Meyer + Vorster Architects

## Context/Integration

Kuyasa is a new railway transport interchange that serves the historically marginalised and dislocated township of Khayelitsha, Cape Town. One purpose of the interchange is the gradual change of the spatial make up of isolated neighbourhoods and to bridge the competing rationalities and demands that characterise South African townships (Meyer & Vorster, 2011: 4).

## Function of building

The intervention provides the facilitation of intermodal transit as well as routes and spaces designed to accommodate commuters, formal and informal commercial activity and social opportunities in the form of gathering space. By combining the scale and layering of connecting the routes and movement patterns, a vibrant civic node is created (*ibid*).

The South African climate lends itself to outdoor activity and combined with the ample space available to designers in relatively undeveloped areas, like Khayelitsha, it is an apt approach to design a public facility to be more outdoors. Covered and indoor areas provide for the need of basic shelter while a majority of the buildings functions is located outside and around these structures.

Different urban planning devices have been used to add legibility and direction to the project. These include the provision of seating in the form of circular mosaic covered built in seats along principle circulation routes, as well as guiding lines in the pavement that emulates the city grid while connecting to main routes leading into the township.

Covered colonnaded walkways frame the main square and add depth to the surrounding buildings as well as provide cover from inclement weather. This creates a vibrant and active edge to the square, as the traders are located in the structures behind the circulation colonnades, facing towards the square. The roof planes along the edge of the square has been altered in such a way as to add height towards the open square and still maintain a human scale towards the trading spaces. This indicates sensitivity towards pedestrian oriented design.

## Construction_Tectonics of building

Robust, hard wearing and low maintenance materials, such as brick masonry and concrete, were use throughout the project to react to the public nature of the building. These heavy materials also attributes to the proposed permanent nature of the certain activities, which includes public amenities and trading.

A perception of lightness and transparency of activities is achieved with arcades and column colonnades in front of more solid structures. This abundant use of columns gives a vertical quality a largely horizontal surface typology. This typology is utilized to allow the project to blend in with the scale of the surrounding urban fabric.

More lightweight structures where used to give height to more prominent parts of the project, for example, the water tower which indicates the entrance to the railway station. These higher elements also give a landmark quality to the project in its surroundings.

**Fig_4.13** Plan of Kuyasa Interchange **[www.archdaily.com]**
**Fig_4.14** Detailed columns emphasize the grounding of the project **[www.archdaily.com]**
**Fig_4.15** Aerial view of the public square in the Kuyasa Interchange **[www.archdaily.com]**
**Fig_4.16** Trader stalls with colour coded columns **[www.archdaily.com]**
**Fig_4.17** Seating areas at Kuyasa Interchange **[www.archdaily.com]**
**Fig_4.18** Pedestrian movement through Kuyasa Interchange **[www.archdaily.com]**
**Fig_4.19** Section through trader stalls **[www.archdaily.com]**
**Fig_4.20** Image of model of Kuyasa Interchange **[www.archdaily.com]**
**Fig_4.21** Taxi and bus drop off zone **[www.archdaily.com]**


fig_4.14


fig_4.15


fig_4.16


fig_4.17


fig_4.18

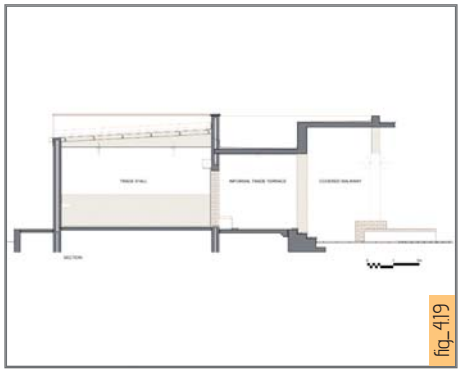


fig_4.19


fig_4.20


fig_4.21

# 4_04 Philippi Public Transport Interchange

_Philippi, Cape Town, South Africa

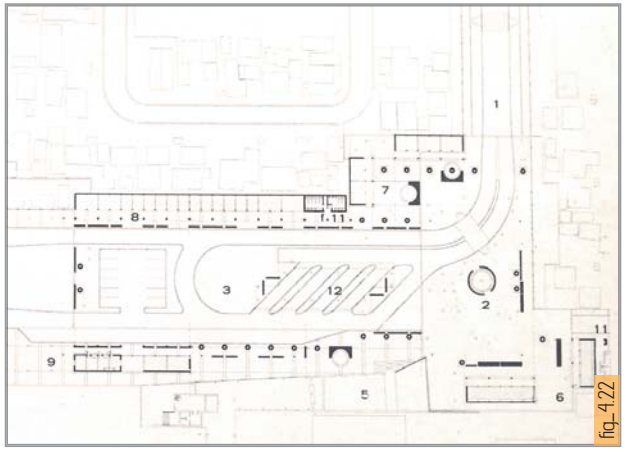



fig_4.22

Location
_Cape Town, South Africa
Type
_Urban Public Transport Facility
Scale
_Urban, Public
Client
_City of Cape Town
Date of Completion
_2003
Designer/s or Developer
_Du Toit and Perrin Associates

## Context/Integration

The Philippi Public Transport Interchange is part of transformative process that is taking place in the harsh and destitute environments of Philippi in the Western Cape. The project is located 20km from the Cape Town CBD in Philippi. The railway station in Philippi is the third largest train station in Cape Town with 30000 daily commuters, predominately pedestrians as stated by Deckler (2006:81).

## Function of building

Deckler (*ibid*) explains that the projects' intent is to create a public terrain with the support of key programmes, which would benefit and facilitate community needs. The project aim, similar to the aim of the author in this dissertation, is to establish an integrated public environment which would support future public and private investment. The project can therefore, be seen as a catalytic intervention in a low income community.

The project has an urban quality, firstly because of the scale, with the length of the development stretching almost two town blocks. Secondly the urban nature is reinforced by the project supporting informal economy by incorporating existing traders, basic needs of the community and the needs of the daily commuting public.

The public spaces are grouped together in the centre of the designed space, surrounded by various scales of trading activities. The public space comprises of mainly seats, taps, cooking platforms and outdoor rooms formed by trees clustered together.

## Construction_Tectonics of building

The architecture of the interchange consists of well-proportioned and detailed frames, which allow for the infill of small businesses. The buildings are conceived as urban building blocks.

The uniqueness of the building is celebrated in the corners and threshold areas by simplistic poetically functionalism.

The architecture is on a human scale and is designed to be useful. This amenity and everyday quality are particularly direct and evident in the design of the interchange. The buildings, although very simple, provides enough activity generation, to transform the interchange into a civic centre.

This civic quality achieved through the everyday activities of traders and commuters is a main generator in the design of the interchange at the Hammanskraal station. Public transport and informal trade are potential main income generators which could help to revive the commercial district of Hammanskraal.

For an intervention to be successful in chaotic conditions like those manifested in Hammanskraal, it needs to be understated and straightforward. The architecture produced need to be able to react to these conditions, with the public spaces able to absorb various programmes and users.

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**Fig_4.22** Plan of Philippi public interchange **[Deckler, 2006:79]**
**Fig_4.23** Pickup and drop off zone **[Deckler, 2006:80]**
**Fig_4.24** Trader stalls at Philippi public interchange **[Deckler, 2006:80]**
**Fig_4.25** Aerial view of station concourse connecting Philippi station to the interchange **[Deckler, 2006:80]**
**Fig_4.26** Covered taxi stops **[Deckler, 2006:80]**
**Fig_4.27** Trader stalls opening up to a circulation colonnade **[Deckler, 2006:80]**
**Fig_4.28** Elevation of Philippi public interchange **[Deckler, 2006:81]**
**Fig_4.29** Elevation of Philippi public interchange **[Deckler, 2006:81]**


fig_423


fig_424

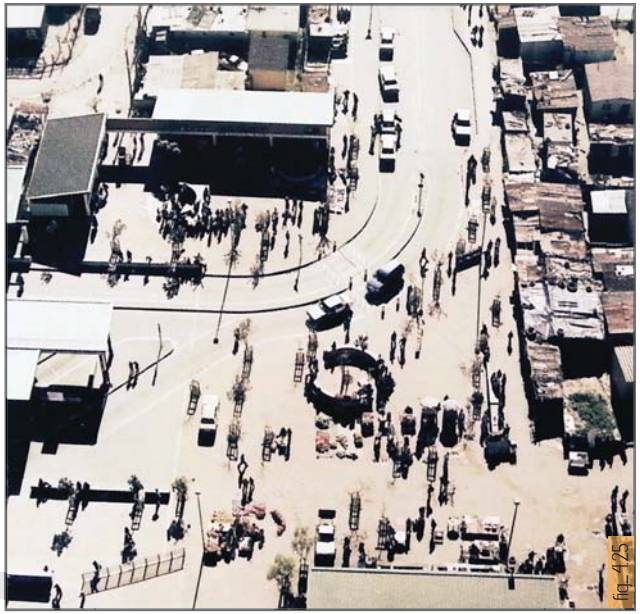


fig_425

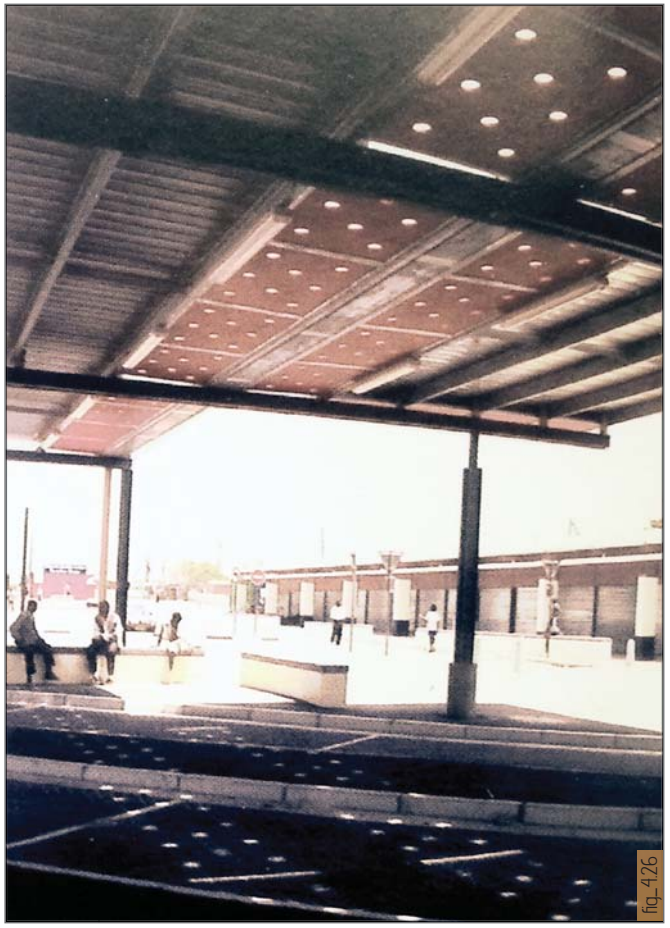


fig_426


fig_427


fig_428


fig_429

# 4_05 Lagos Train Station

_Lagos, Portugal


fig_4.30

Location
Lagos, Portugal
Type
Urban Public Transport Facility
Scale
Urban, Public
Client
Invesfer / Refer
Date of Completion
2005
Designer
Henrique Barros-Gomes

## Context/Integration

The Lagos train station operates between Lisbon, Lagos and Faro and is situated 20min walk from the Lagos CBD (Lagos Train Station: 2011).

## Function of building

The project consists of two buildings linked together by a common square and covered area. The building houses the new station functions under a single cover that project to the surrounding exterior spaces (Barros-Gomes: 2012).

The design consists of three separate volumes:

- The technical services, not available to the public except for toilets
- The construction volume is similar to the previous, but smaller and houses the ticketing office and associated services.
- The third volume houses the lobby areas, circulation and waiting area for passengers. From the passenger area, a covered pier and platforms serve two new railway lines.

## Construction_Tectonics of building

The first two areas mentioned above have a closed, opaque and non-reflective character, assuming itself as 'boxes'. In contrast to the first two, the third space is limited on three sides by glass curtain walls. Its importance is given hierarchy by a higher ceiling than the other volumes (*ibid*).

The transparent material choices allow passengers to see when trains are approaching. It also allows potential commuters from outside to navigate the space as functions are exposed through the glazed walls.

This project utilizes robust details. Materials throughout the project contrast each other to emphasize or define certain spaces and functions.

This precedent was chosen for its spatial simplicity and material use. Waiting and circulation areas are differentiated through texture and material differences as seen in figure 4.34 and 4.36. Timber flooring is separated from a smooth epoxy floor finish with a shadow line. This spatial and functional difference is emphasized through the contrasting materials and textures, celebrating the threshold more successfully.

Another construction oriented aspect of the precedent that makes it relevant to the dissertation is the public space created in front of the station as seen in figure 4.32. It is effective in its simplicity as it regulates pedestrian traffic, with fast and slow routes. Functional separators such as low walls that separate routes and ramps are created wide enough to function as seating as well.

Roof edges that line up with ramps and routes below emphasize their function and increase the legibility of the project as a whole.

Sun protection elements in figure 4.35 doubles as security barriers and become a route indicator, drawing the eye to the access point into the station.

**Fig_4.30** Aerial photo of the Lagos Station next to the Lagos Marina Harbour **[Google earth image]**
**Fig_4.31** Platforms Lagos railway station **[www.henriquebgomes.com]**
**Fig_4.32** Public square in front of railway station **[www.henriquebgomes.com]**
**Fig_4.33** View of Lagos railway station **[www.henriquebgomes.com]**
**Fig_4.34** Waiting area inside Lagos railway station **[www.henriquebgomes.com]**
**Fig_4.35** Column and sun screen detail at Lagos railway station **[www.henriquebgomes.com]**
**Fig_4.36** Materials are mixed to define and emphasize different spaces **[www.henriquebgomes.com]**


fig_4.31


fig_4.32


fig_4.33


fig_4.34

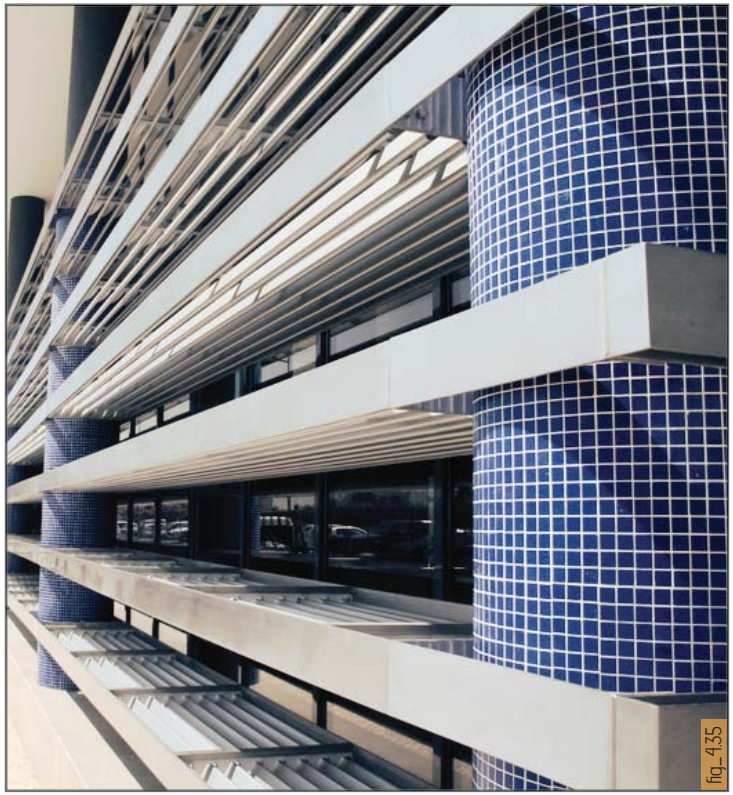


fig_4.35

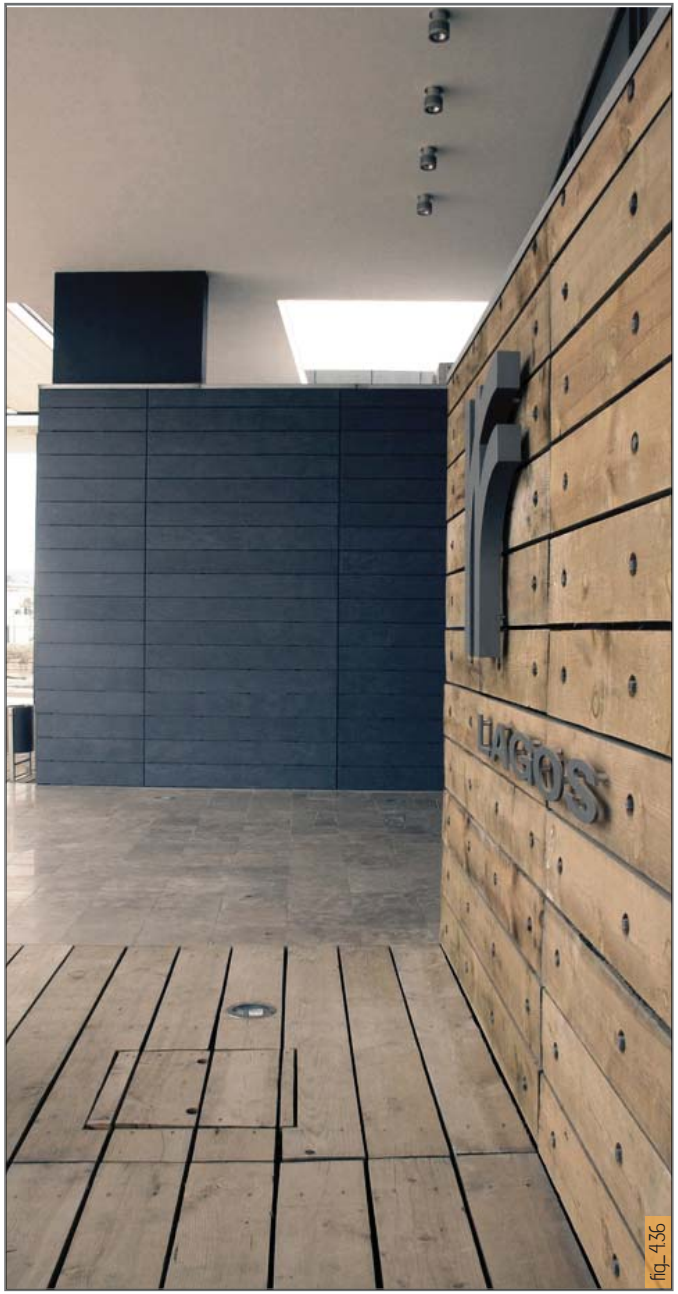


fig_4.36

fig_5.01

# Chapter 5
# Urban Framework



**Fig_5.01** Dilapidated pedestrian bridge across the railway tracks **[Author, 2012]**

"The design of the activity spines and streets and their public environment is of vital importance because they require people to continuously move past them whilst enhancing their convenience, enjoyment and safety. However in the promotion of certain activity linkages the need for permanent 'force of attraction' is paramount as they will further the sustainability of the economic activities along the street as well as the benefit from developing a conductive public environment"

**City of Tshwane Spatial Development Strategy (2007: 3)**

# 5_01 Urban design approach and main goals

The proposed urban framework for the study area has been done with the following goals in mind:

- Pedestrianization of the larger Hammanskraal movement and activity spine.
- Activation of ecological viable space
- Reactivation of industrial, commercial and transportation nodes along the movement spine of Hammanskraal
- Integration with ecological corridor
- Individuality & uniqueness of place
- Creating a tightly knit urban fabric

In addition to the above goals, the urban framework focussed on three prominent areas along the main circulation axis, north to south, which through activation could act as catalysts for urban development and community integration. These zones are illustrated in figure_5.13 and are the Babelegi industrial area to the north; the open land and the northern shores of the Leeukraal dam in the centre of Hammanskraal; and the commercial precinct and transportation hub to the south of the Leeukraal dam.

Focus is placed on social spaces, their resulting community enrichment qualities and the reintegration of various nonresidential zones into the community. This entails the reactivation of the industrial precinct, Babelegi, and the public transport systems such as the Hammanskraal public commuter railway service. Public transport plays a prominent role in the sustainable design of the area; therefore specific attention is given to the provision of this service, in the form of bus and taxi stops within comfortable walking distance of residential areas.

All the dissertation projects in this study area are linked by proposed programmes. Figure 5_02 explains this connection. Node 1 proposes a community agriculture training centre; Node 2, an agricultural packaging and distribution facility for small scale residential farmers; and Node 3 proposes a biogas refinery that deals with agricultural waste products.

The following legend applies for all the maps and frameworks provided in Chapter 5_Urban Framework:



fig_5.02

**Fig_5.02** Nodal dependency within the framework **[by Author]**

# Macro Scale

fig_5.03

fig_5.04

fig_5.05

fig_5.06

**Fig_5.03** Map highlighting the Hammanskraal framework group's study area. Indicated as the darker portion **[Author, 2012]**
**Fig_5.04** Canada Line_Olympic Village SkyTrain Station,Vancouver, Canada **[www.topboxdesign.com]**
**Fig_5.05** McBean Transfer Station, Santa Clarita, LA **[www.aecom.com]**
**Fig_5.06** Transit oriented design, Pheonix, Arizona **[www.valleymetro.org]**

## 5_02 Major existing activity nodes with pedestrian and vehicular circulation routes

The majority of the primary nodes in the study area are multipurpose nodes, which consist of informal trade, formal commercial activity, transport oriented funtions and recreational activities. Other nodes that consist of industrial activities and are mostly located around Babelegi industrial area. These nodes mainly operated as distribution nodes from heavy cargo.

Even though most nodes have a transportation element attributed to them, being either a bus stop or a informal taxi gathering area, the gateway site situated in the commercial precinct to the south acts as the major transport node. This node consists of a major taxi rank, a large amount of informal trading activity and the proposed railway station dealt with in the dissertation.

All of these primary activity nodes are located next to major vehicular routes, giving them easy access to resources and maintenance opportunities. Pedestrian routes indicated are informal and formed naturally as residents cross the natural belt dividing the town in two. Leeukop dam to the south can be seen as a natural node as it provides for some recreational activity in the area.

1 Industrial
Distribution of goods

2 Industrial
Distribution of goods

3 Multipurpose
Mainly residential and light commercial
Distribution of people and goods

4 Multipurpose
Mainly residential and light commercial

5 Gateway site
Multipurpose / Transport and commercial
Distribution of people and goods

6 Multipurpose
Transport and commercial
Distribution of people and goods


fig_5.07

**Fig_5.07** Map showing major existing nodes in the study area
**[Hammanskraal Urban Framework Group, Author, 2012]**

## 5_03 Proposed secondary infill nodes

Secondary nodes are proposed between the existing nodes to enhance community access with regard to public transport, informal trade and other necessary services. They have been placed along prime transport routes after a walking distance analysis was done. All nodes are located within 400-600 meter of each other, which roughly translates to a 5-10 minutes walk.

A further aim of these nodes is to enhance and reinforce the main vehicular transport spine running along the old Bela-Bela road, as well as formalizing the pedestrian routes already being used by pedestrians. This will ensure safe environments for all pedestrians, as well as the promotion of a sustainable community due to use and integration of public transport in the impoverished area.

1. Transport_Bus and taxi stops
   Light commercial
   Informal trade

2. Transport_Bus and taxi stops
   Light commercial
   Informal trade

3. Transport_Bus and taxi stops
   Light commercial
   Informal trade

4. Light industrial
   Ecological

5. Ecological
   Water oriented node
   Possible recreational

6. Ecological
   Water oriented node
   Possible recreational

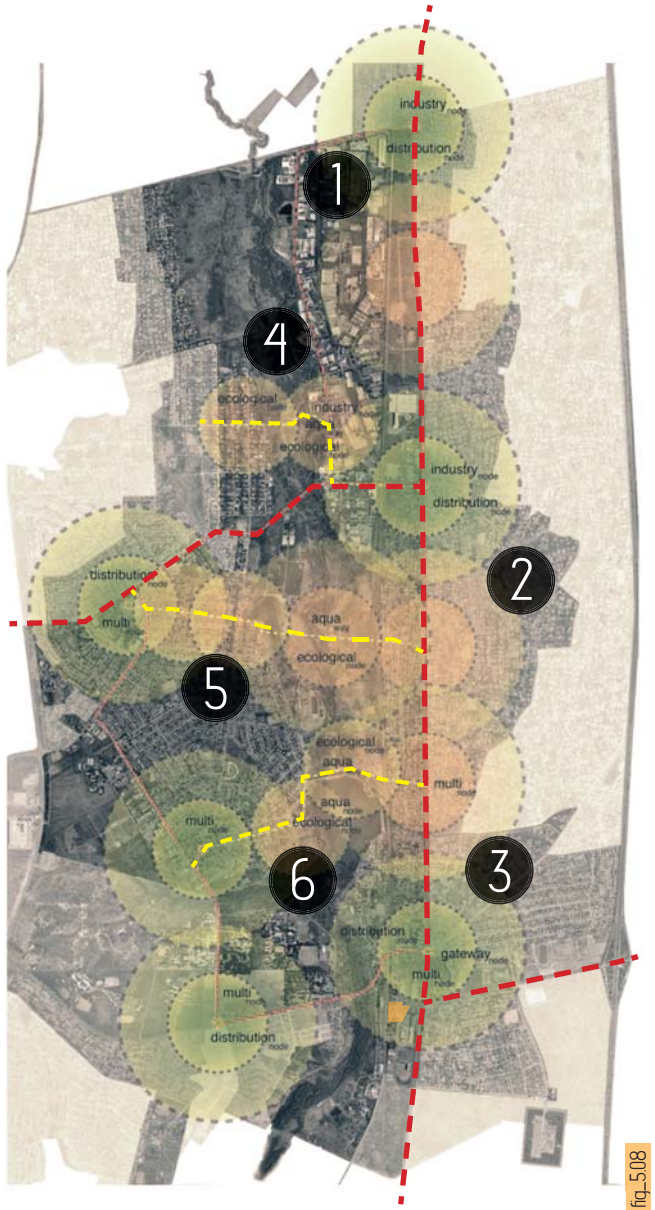



fig_5.08

**Fig_5.08** Map showing proposed nodes inbetween existing nodes
**[Hammanskraal Urban Framework Group, Author, 2012]**

# 5_04 The effect

The map to the right indicates the effect the proposed nodes will have on the study area. These effects are divided into what activities exists and what activities are proposed at each node.

## Existing

**1**
- Adjacent to small holdings
- Adjacent to natural threshold
- Adjacent to industrial area
- Adjacent to privately owned property to north
- Northern edge of provincial boundary
- Gateway to Babelegi and Majaneng

**2**
- Dilapidated mostly vacant industrial zone
- Adjacent to low density residential area
- Adjacent to main route between Bela Bela and Pretoria
- 'Lost' green space inbetween industrial and polluted natural environment

**3**
- Gateway into Hammanskraal
- Active core with critical mass
- Main transportation interchange
- Formal and informal trading hub
- Neglected and decayed space
- Pedestrian catchment area: low-medium density

**4**
- High density formalized commercial area
- Adjacent to policy academy
- Adjacent to medium density residential area
- Adjacent to educational institutions
- Existing formal transportation node_Bus service

**5**
- Established public space
- Adjacent to two churches
- Adjacent to shebeen and informal trade

**6**
- High density commercial within residential zone
- Diverse environment consisting of:
  - Institutional entities
  - Commercial buildings
  - Residential areas

## Proposed

**1**
- Public transportation node
- Upgrade natural threshold for public use
- Provide public amenities
- Low density commercial trading
- Fragmentation of industrial edge to commercial

**2**
- Revitalize, activate and re-establish industrial area
- Integrate industrial and natural relationships
- Reintroduce critical mass through residential densification
- Establish as gateway between Ramotsi, Babelegi and Temba
- Public transportation node
- Introduction of commercial centre to the north

**3**
- Rezone inappropriate programmes in the area
- Autocentric to ecocentric shift
- Formalise pedestrian linkage to Temba
- Propose public square for informal trading
- Formalize entrance into Hammanskraal
- Establish as transport and distribution node

**4**
- Pedestrian link to main commercial node

**5**
- Public transportation node
- Establish entrance into Temba

**6**
- Formalise transportation node
- Proposed public space

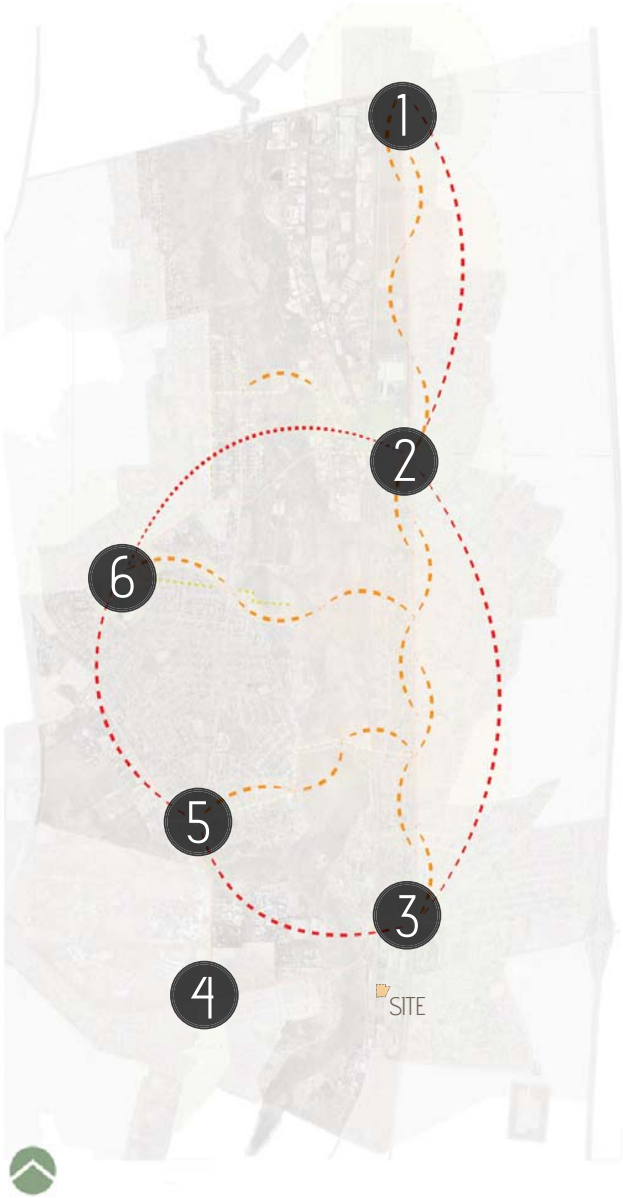



fig_5.09

**Fig_5.09** Map showing the desired affect of the proposed nodes **[Hammanskraal Urban Framework Group, Author, 2012]**
**Fig_5.10** The industrial landscape of Hammanskraal **[Hammanskraal Urban Framework Group, Author, 2012]**
**Fig_5.11** The natural landscape of Hammanskraal **[Hammanskraal Urban Framework Group, Author, 2012]**

**Fig_5.12** The infrastructural and historical language of Hammanskraal **[Hammanskraal Urban Framework Group, Author, 2012]**
**Fig_5.13** Map showing the division of Hammanskraal for framework purposes. **[Hammanskraal Urban Framework Group, Author, 2012]**

5_05 Focus areas within Hammanskraal

## zoneA _Industrial


fig_5.10

## zoneB+C _Natural and recreational


fig_5.11

## zoneD _Economical and Infrastructural


fig_5.12

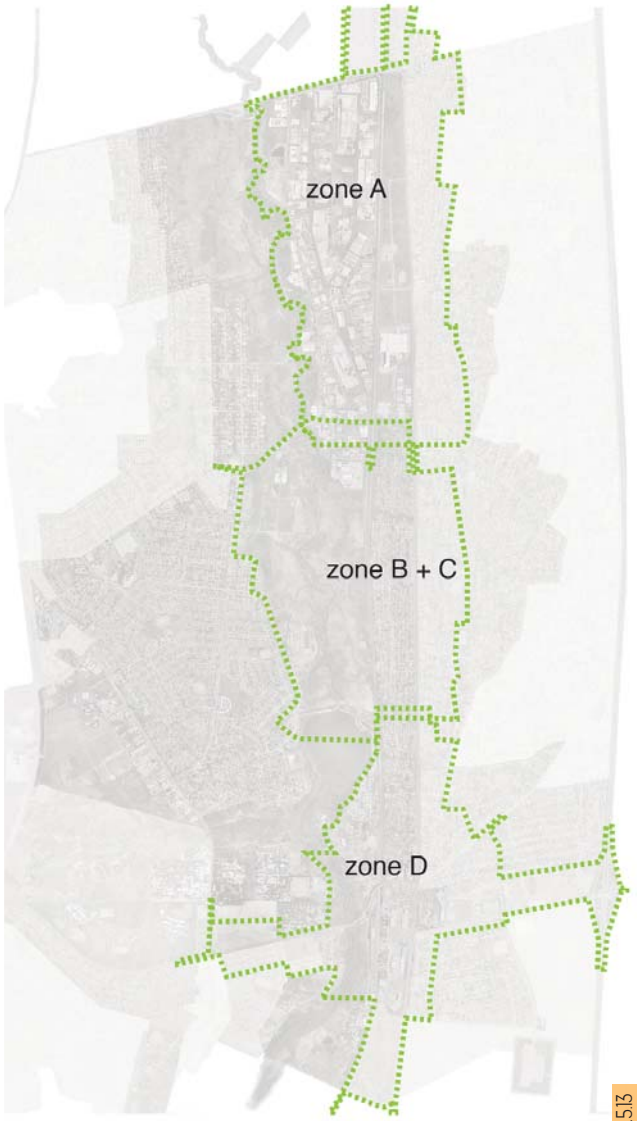


fig_5.13

# Meso Scale

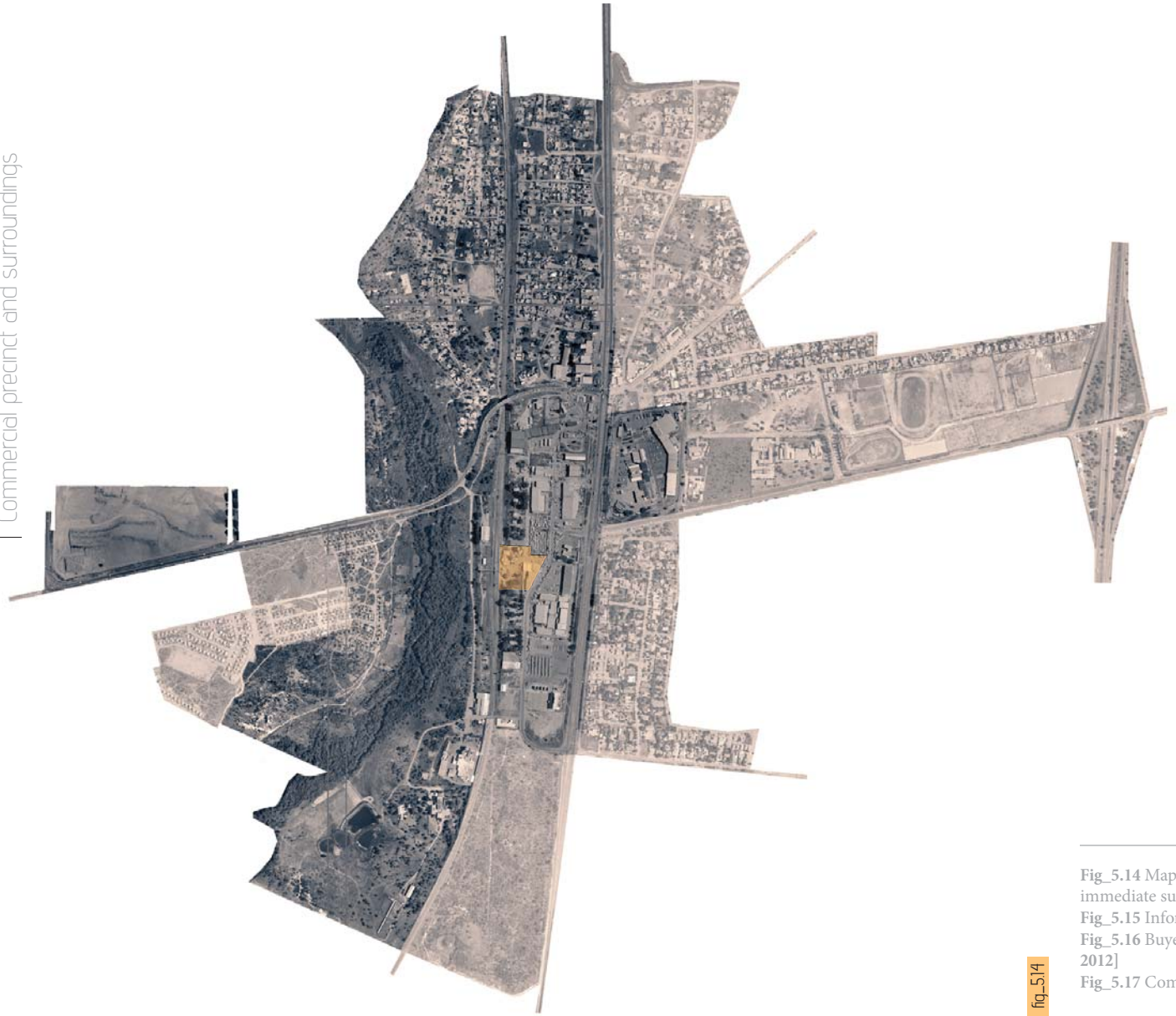


fig_5.14

fig_5.15

fig_5.16

fig_5.17

**Fig_5.14** Map showing the Hammanskraal commercial precinct and its immediate surroundings **[Author, 2012]**
**Fig_5.15** Informal vehicle shading as job creation **[Author, 2012]**
**Fig_5.16** Buyers from informal traders walking to market **[Author, 2012]**
**Fig_5.17** Commuters waiting for busses and taxi's **[Author, 2012]**

## 5_06 Proposed nodes

All main proposed nodes are located north of the commercial precinct. Focus in this area is placed on reactivation of the existing main nodes to reestablish it as a viable socio-economic zone.

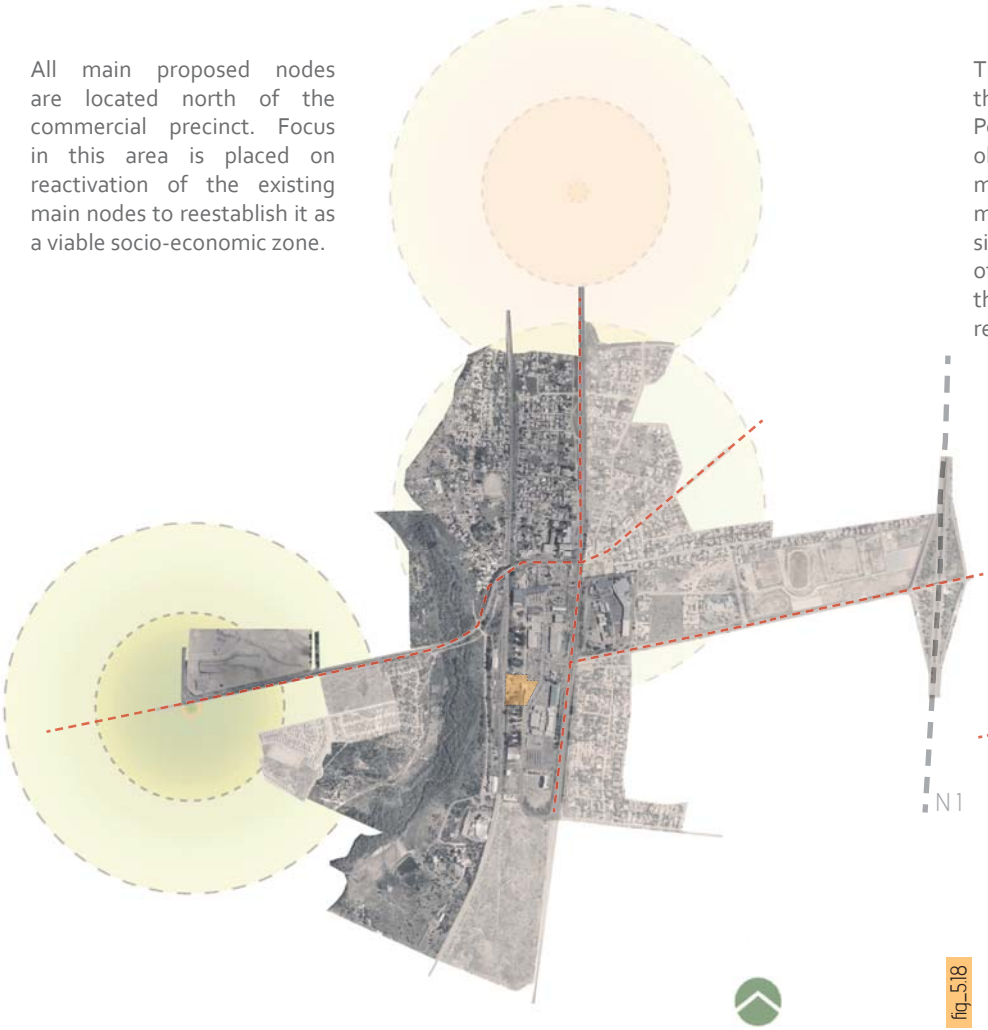



fig_5.18

**Fig_5.18** Map showing existing and proposed nodes in the Hammanskraal commecial precinct **[Author, 2012]**

## 5_07 Vehicular and pedestrian routes

The precinct is located west of the N1 between the Pretoria-Polokwane railway line and the old Bela-Bela road. Pedestrian movement flows from the main vehicular routes on the site boundaries to the centre of the site where most of the informal trading activity resides.


fig_5.19

**Fig_5.19** Map showing movement routes in and around the site **[Author, 2012]**

## 5_08 Existing urban fabric

Zoning indicates transport infrastructure in between a high concentration of commercial activity in the gateway zone. The precinct is surrounded by natural, residential and institutional zones, providing critical mass for the urban core.

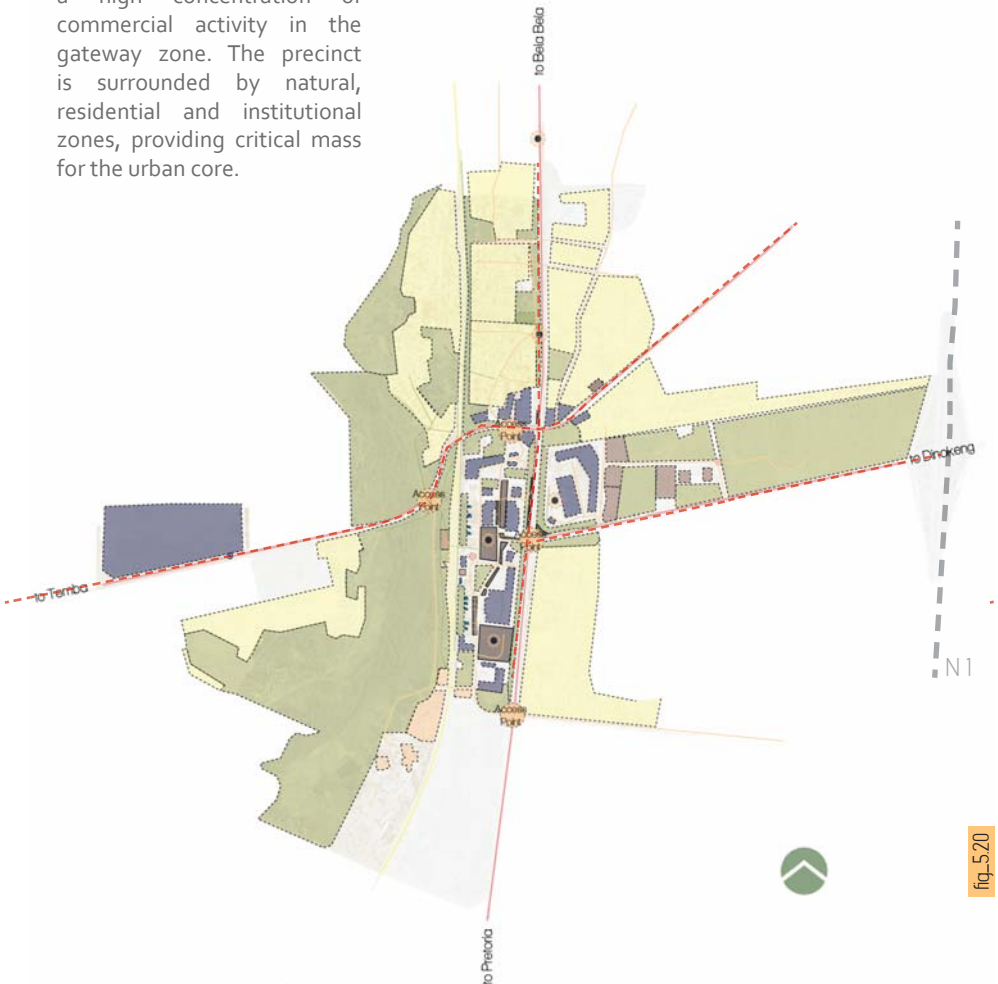



fig_5.20

**Fig_5.20** Current zoning of the Hammanskraal commercial precinct **[Author, 2012]**

## 5_09 Deductions and movement proposals

Analysis of the area indicates a need for safe crossing across the railway track to integrate the communities and traverse natural and man-made boundaries. Pedestrian feeding zones should be upgraded to allow for ease of movement into the precinct.

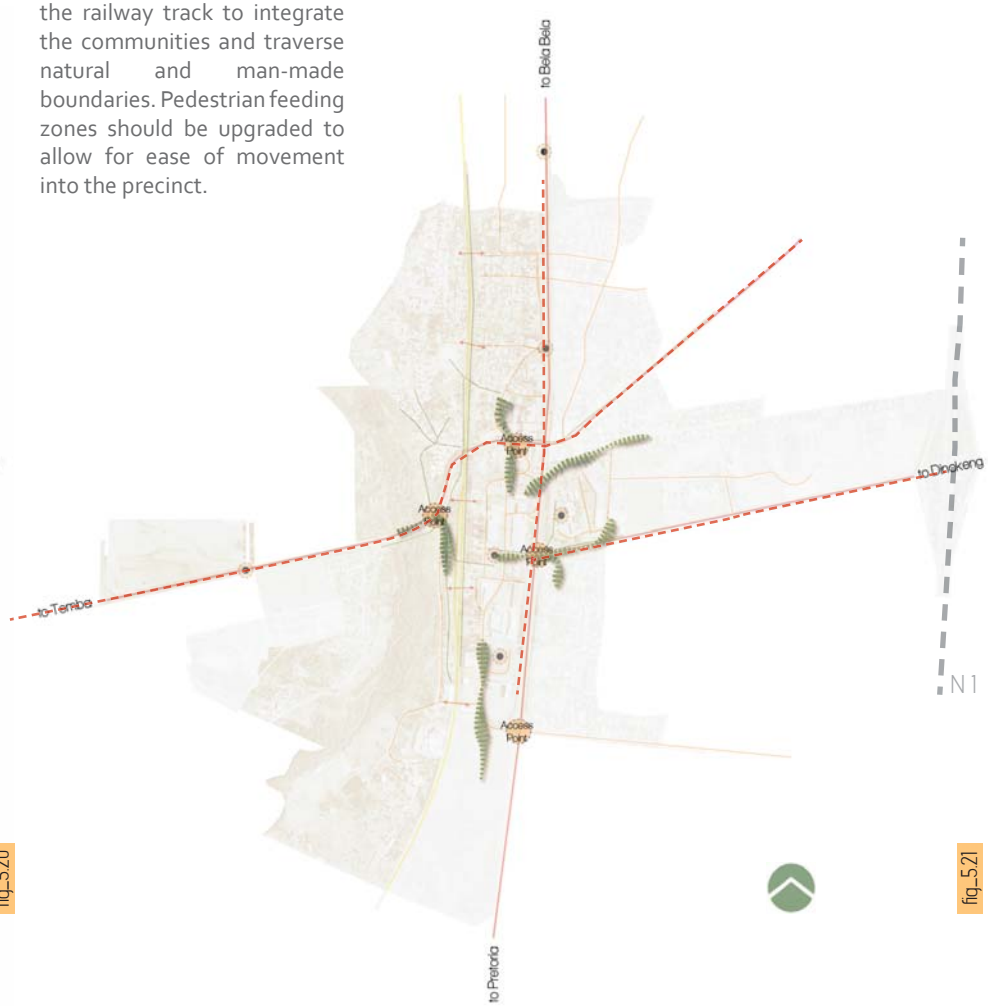



fig_5.21

**Fig_5.21** Proposed access and movement patterns **[Author, 2012]**

## 5_10 Node development proposals

The main public transport channels of the region serves as moblity routes, connecting a number of nodes and mixed use areas. These routes could support linear development although not necessarily continuous along its length. Higher order land uses should be accommodated in the nodes, but lower order land uses could develop in a linear fashion subject to alternative access opportunities. Densification along these spines should be encouraged to maximise the public transport opportunities provided by these routes.

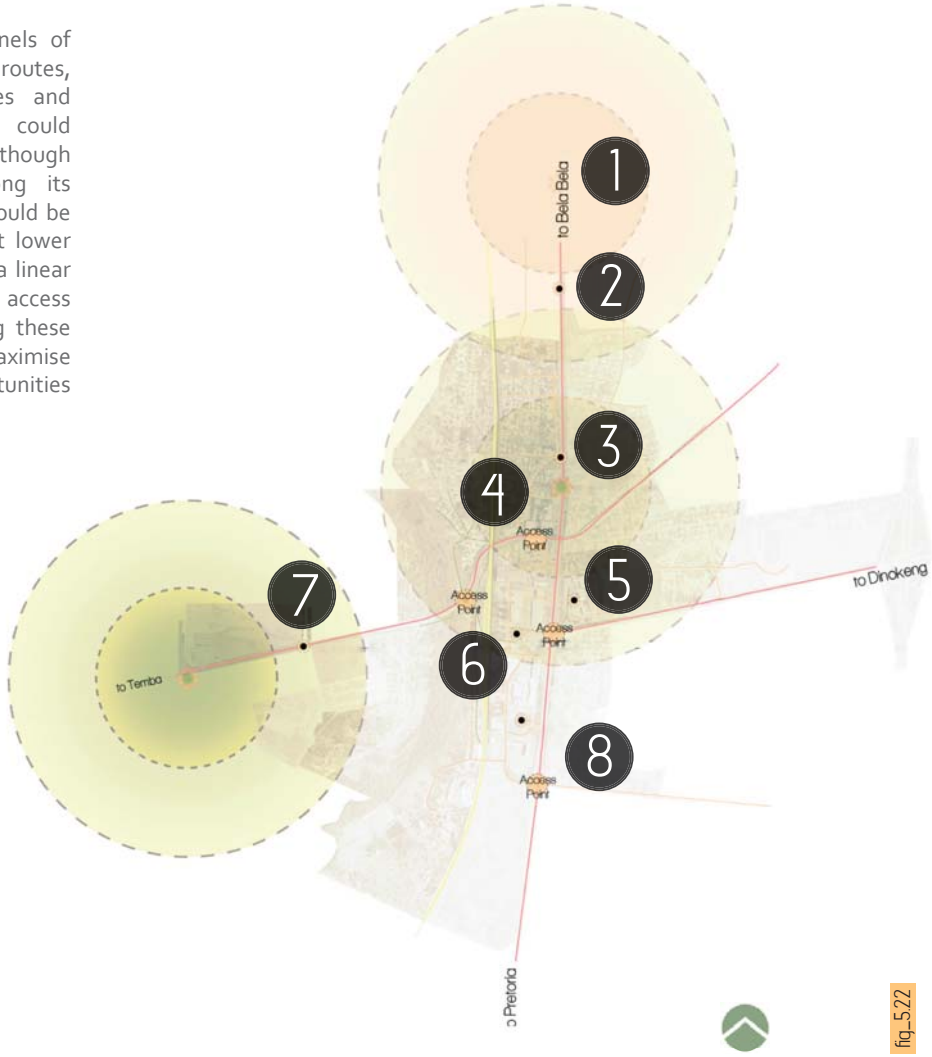



fig_5.22

1
- Low density commercial activity
- Activate waiting zone for commuters
- Mixed use surrounding residential
- Activate route along main transport spine

2
- Pedestrian node

3
- Pedestrian node

4
- Major transport and commercial node
- Upgrade facilities available for social intergration
- Revitalise local industry and business by providing new attractions like an integrated transport inter change
- Provide ease of access to commuters
- Restore historic and vacant buildings

5
- Taxi node

6
- Taxi node

7
- Bus node

8
- Taxi node

**Fig_5.22** Map showing the desired affect of the proposed nodes **[Author, 2012]**

## 5_11 Proposed new zoning

The proposed zoning is developed around three large public squares evenly spaced throughout the block. Commercial and retail activities are still encouraged on the site, but with more density and integration.

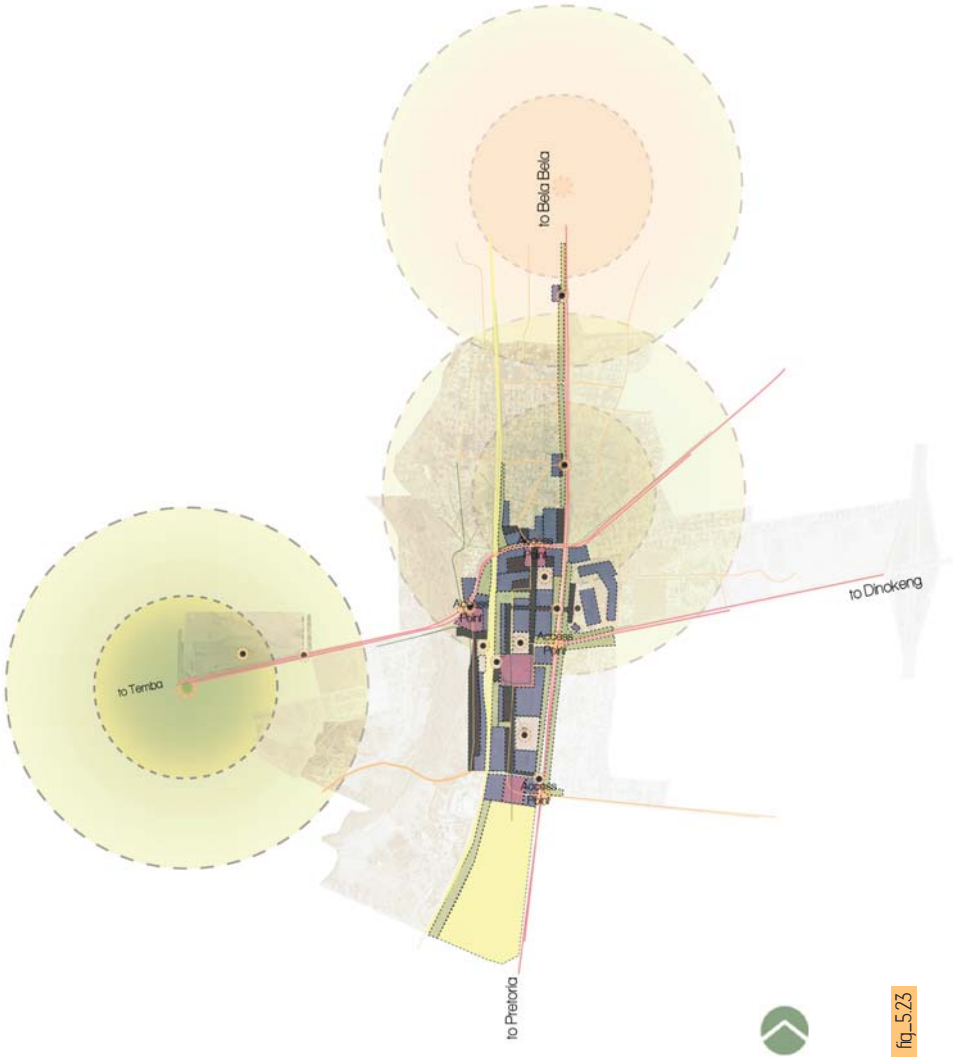



fig_5.23

**Fig_5.23** Map showing new zoning proposal **[Author, 2012]**


fig. 6.01

# Chapter 6
# Context and Site



**Fig_6.01** Water reservoir next to the Hammanskraal Railway Station which stands out as a focal point in the commercial precinct **[Author, 2012]**

# 6_01 Historic context of Hammanskraal

Hammanskraal has its roots in the supplies and cattle trading business of Hamman, a farmer 'who, while transporting supplies to this area, established a kraal made of thorn tree branches to protect his oxen from lions'. The kraal became known as Hamman's Kraal throughout farming circles, hence the present name Hammanskraal.

According to a deed search done by Rossouw (1963: 7-8) the first farms in the area were allocated to white farmers, during 1860, although most of the land has been designated and owned by Africans but embarked as Bantu locations by the Zuid Afrikaanse Republiek. Between 1870 -90 white farmers settled in a large portion of the area. which has only been surveyed and transported in the 1890's

The 1903 - 1905 report of the South African native affairs commission calcutates the population of the Hammanskraal area as 27874 in 1904 (Native tribes of Transvaal, 1905: 38).

Fully-fledged small town with its own police station, general store, train station and an office of a government department. Native Affairs

Temba was started on a farm called Bezuidenhoutsfarm in 1942 when people forcefully removed from places such as Lady Selbourne, Orlando and Klipspruit were 'dumped' by trucks on the farm. Previously known as 'Sofasonke' - "We are going to die" and later renamed to 'Temba' meaning "Place of hope".

More people were forcefully relocated to the area

Was considered the "only town developed in Tswanaland (Bophuthatswana)" with 250 housing units

Apartheid government decided to create 'homelands' (or 'Bantustans', as the government sometimes referred to them) for African people to keep them away from what they called 'White areas'

Babelegi was proclaimed on a bare piece of land and was the first industrial area in a black homeland where white capital was invested. (Republic of Bophuthatswana, 1977: 144)

Republic of South Africa declared Bophuthatswana a 'self-governing' homeland. Bophuthatswana Territorial Authority

Between 2-9 June 1972, this township hosted a South Africa Students' Organisation (SASO) General Student Council meeting which declared leaders of homelands 'puppets' of the government of the Republic of South Africa.

The first annual congress of the Black People's Convention (BPC) was held here on 16 December 1972

Hammanskraal
Babelegi
Temba

1860-1890 1904 1920 1942 1946-1947 1960 1961 1969 1970 1972 1974 1977 1979 1983 1989 1992 1994 1995 1999 2001

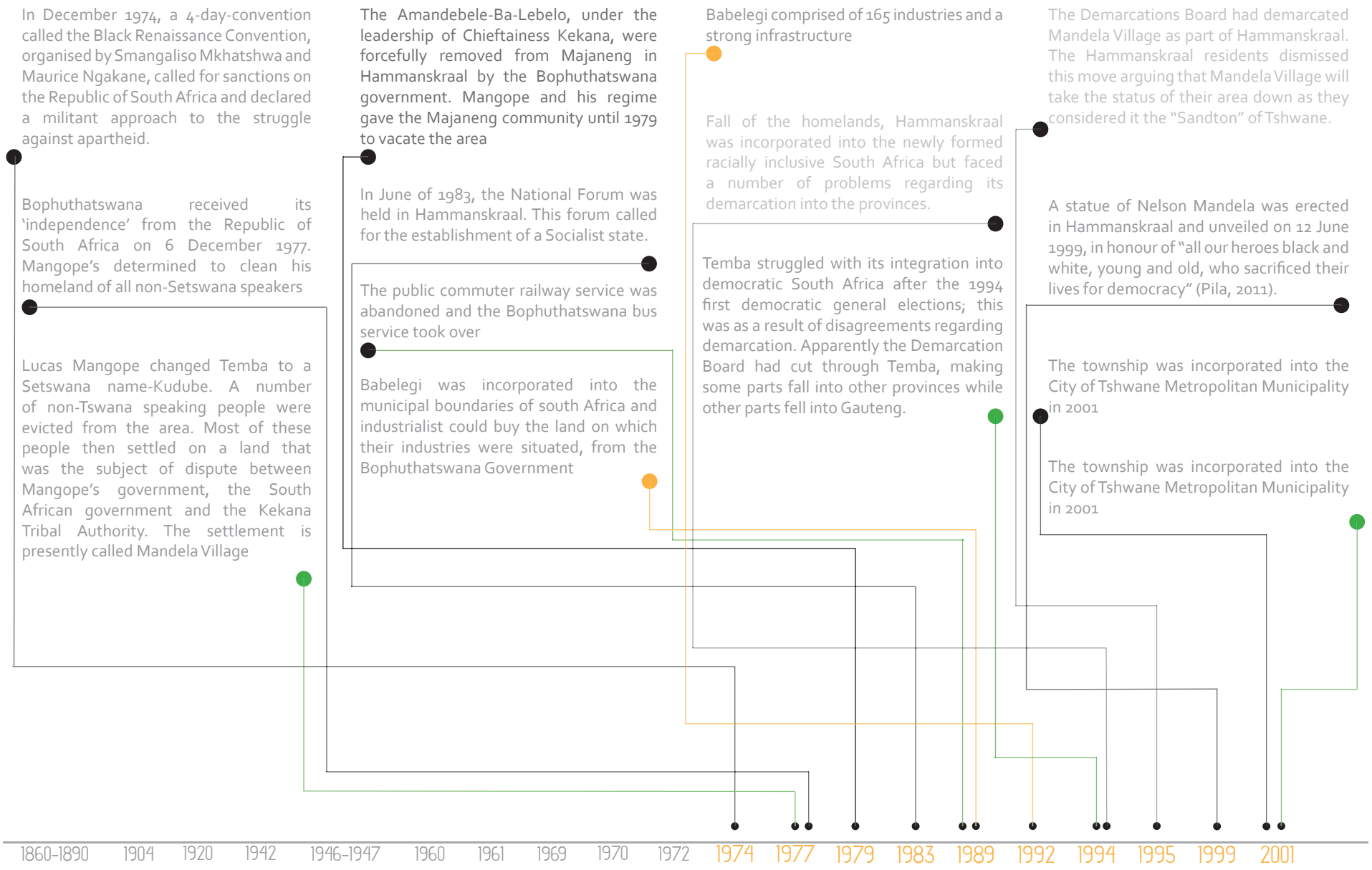





**Fig_6.02** Hammanskraal map of 1980's **[Author, 2012]**

**Fig_6.03** Map indicating development changes in Hammanskraal between the 1980's and 2001 **[Author, 2012]**

**Fig_6.04** Hammanskraal map of 2001 **[Author, 2012]**



Residential
Retail
Commercial
Governmental
Recreational
Infrastructural

As seen on the images to the left, during the 1980's and 1990's Hammanskraal developed along the central north and south transport spine. This development consist mostly of residential and commercial zones. The commercial zone is due to the Babelegi industrial complex to the north.

During the first decade of the new millennium renewed interest from the local government and the Tshwane municipality shows in the development of the gateway area to the south. This area is situated off the off ramp from the N1, a major highway linking Pretoria CBD to Hammanskraal.

Various recreational and retail programmes are situated along this route which ends upon meeting the north-south axis running through Hammanskraal. It is at this junction where the Hammanskraal CBD is located. This is also the location of the study site for this dissertation, indicated on the maps by the orange circle.

**Fig_6.05** Map indicating development changes in Hammanskraal between the 2001 and 2009. Focus from government on the development of the gateway area where the site is located is clearly evident **[Author, 2012]**

**Fig_6.06** Hammanskraal map of 2009 **[Author, 2012]**

# 6_02 Block analysis and site layout

1. Rhino Superstores _Construction wholesalers
2. Renbro Mall
3. Old Railway Houses
4. Shell Petrol Garage
5. Autozone Hammanskraal
6. Shopping Mall
7. Old Hammanskraal Railway Station Platform
8. Service Building
9. Water reservoir
10. Old Hammanskraal Railway Station Main Building
11. Old Hammanskraal Railway Station Shop
12. Pedestrian Bridge
13. Old Hammanskraal Railway Station Warehouse Building
14. Kopanong Shopping Centre
15. Old Railway Houses
16. Kopanong Taxi Rank
17. Brenner Mills


**Fig_6.07** Major nodes and attractions in and around the Hammanskraal commercial precinct block **[Author, 2012]**





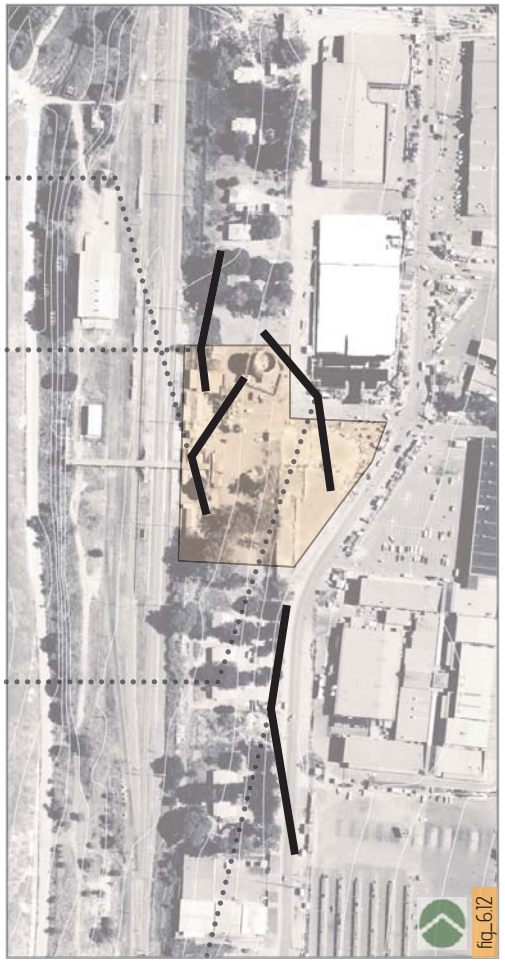



**Fig_6.08-11** View around the Hammanskraal station and Kopanong taxi rank **[Author, 2012]**

**Fig_6.12** Map indicating the location of views shown on the page **[Author, 2012]**



- Isolated
- Surrounded by barriers
- One sided connection

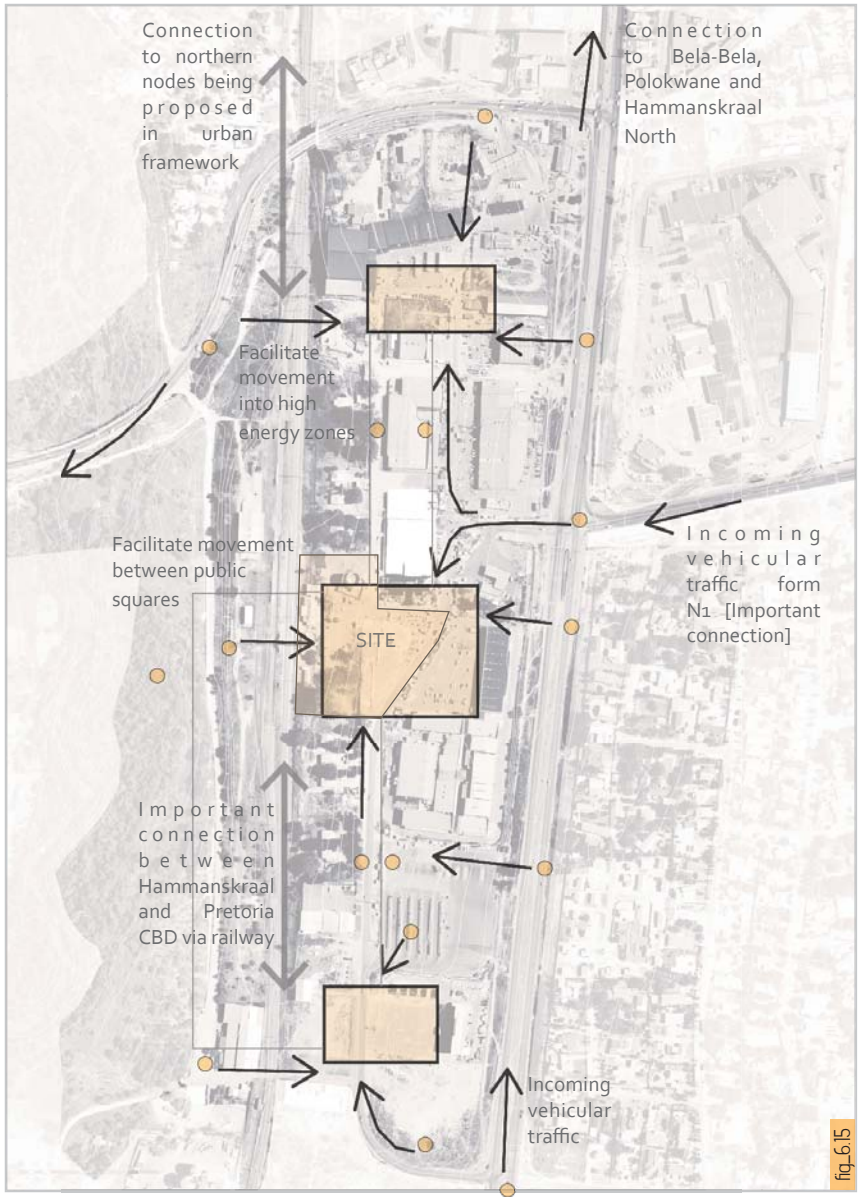
- More developed
- More energy
- Better connected

**Fig_6.13**
Major form giving masses and routes present on the site [**Author, 2012**]

**Fig_6.14**
Image showing the divide in development on the site [**Author, 2012**]

Connecting public squares

Micro nodes



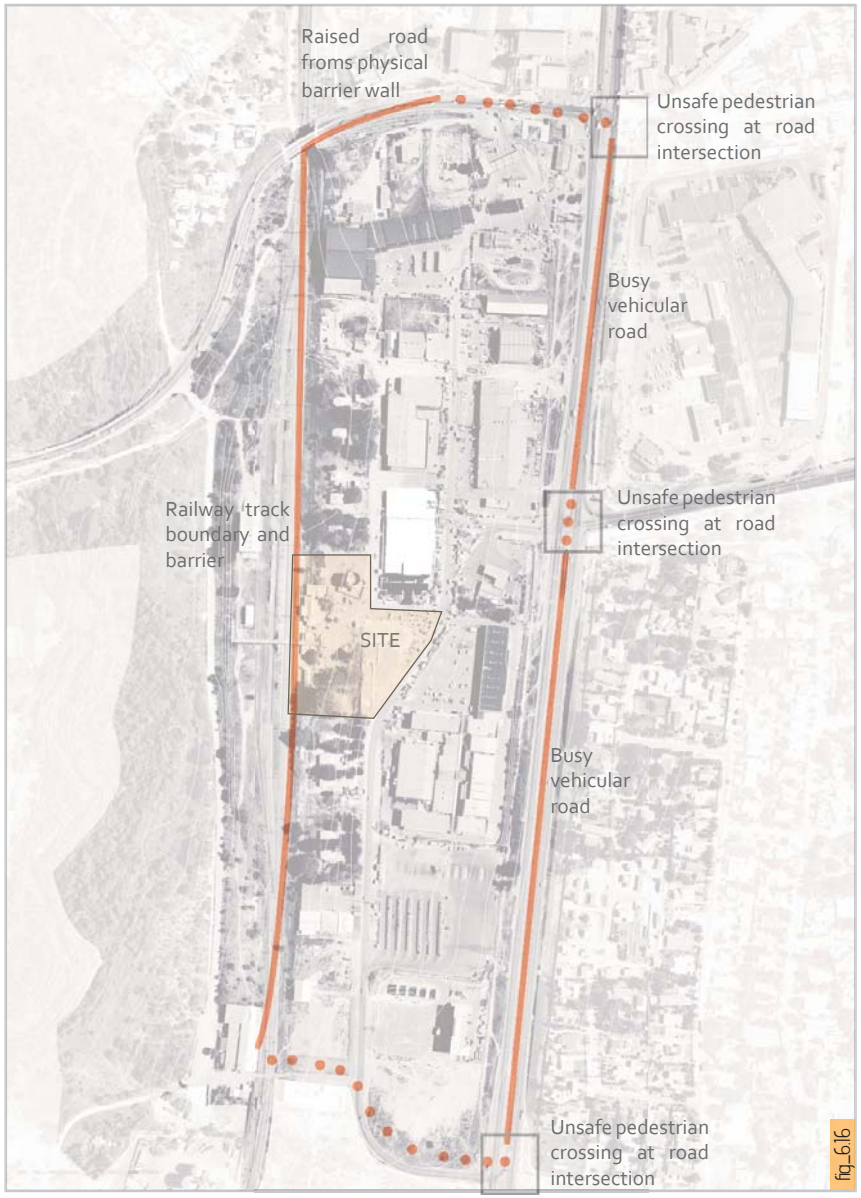
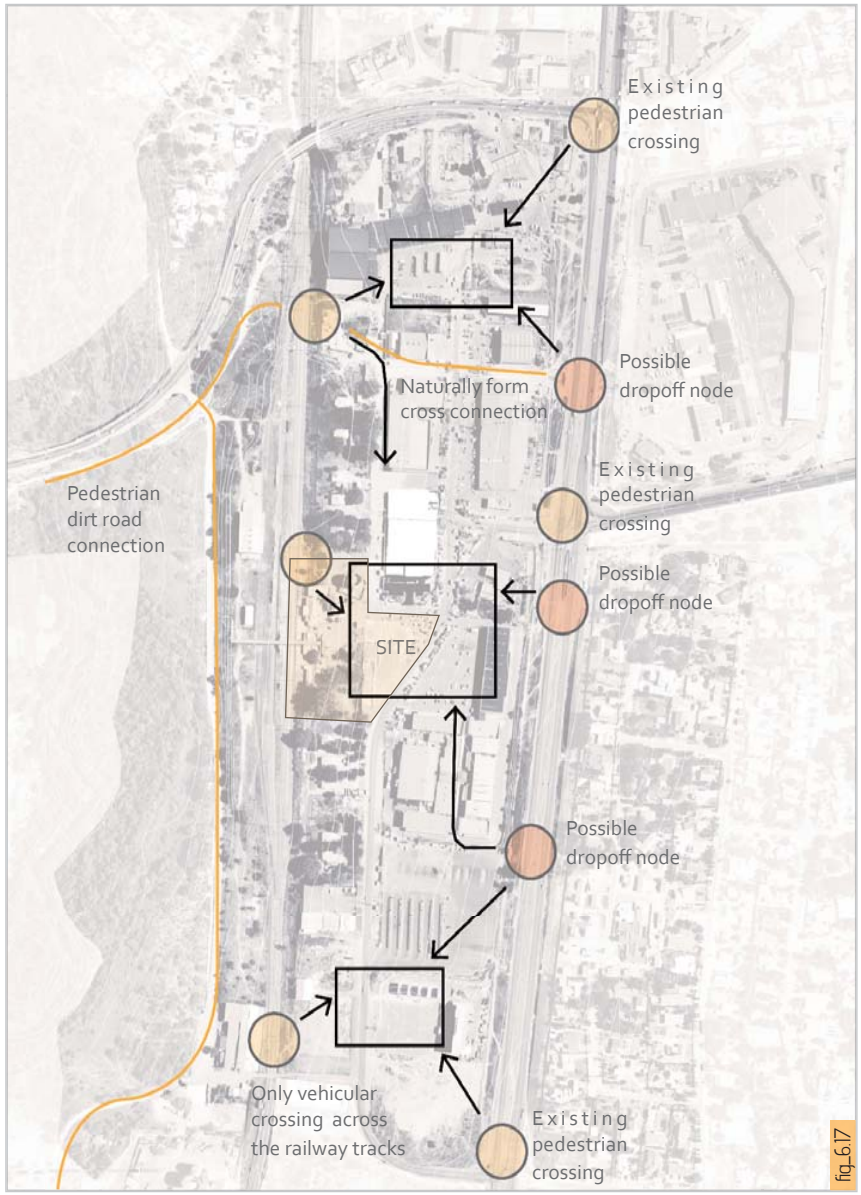
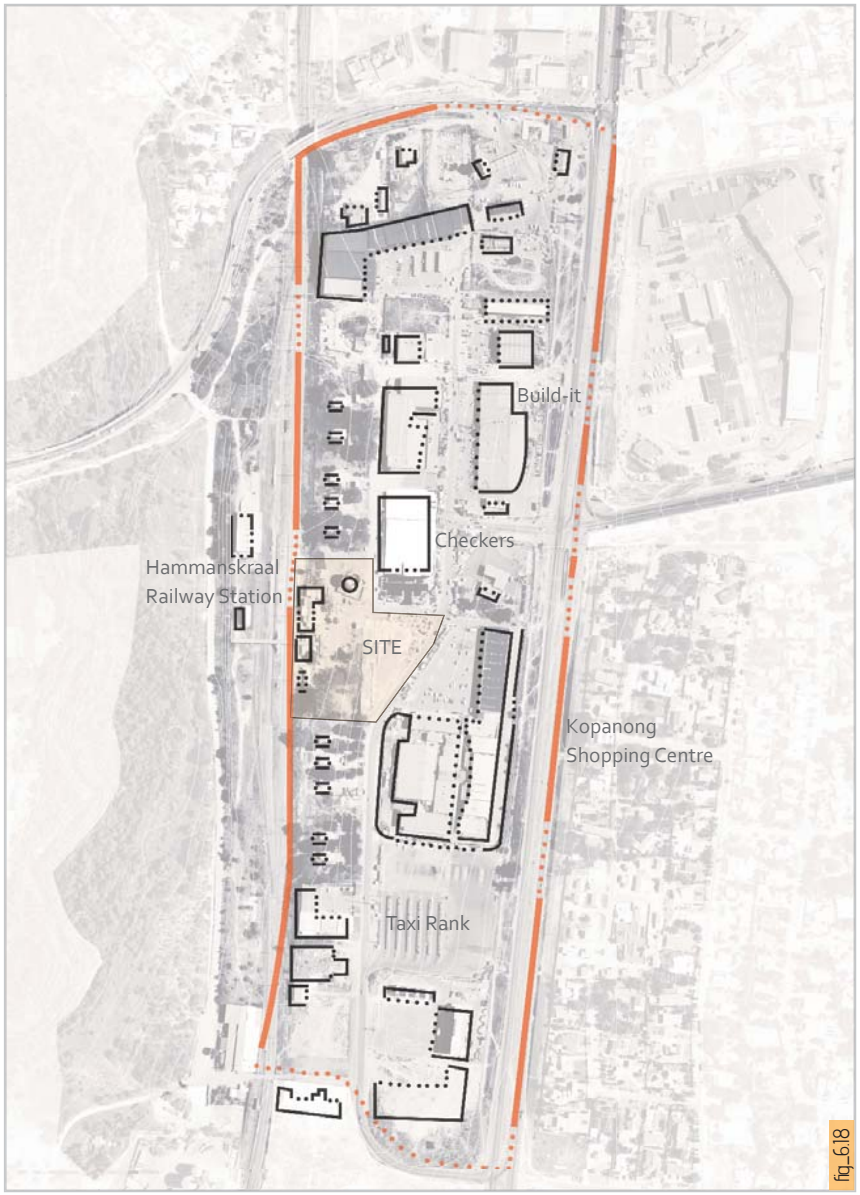




**Fig_6.15**
Public squares and the connections to and on the site **[Author, 2012]**

**Fig_6.16**
Accessibility and boundaries for the block as a whole **[Author, 2012]**



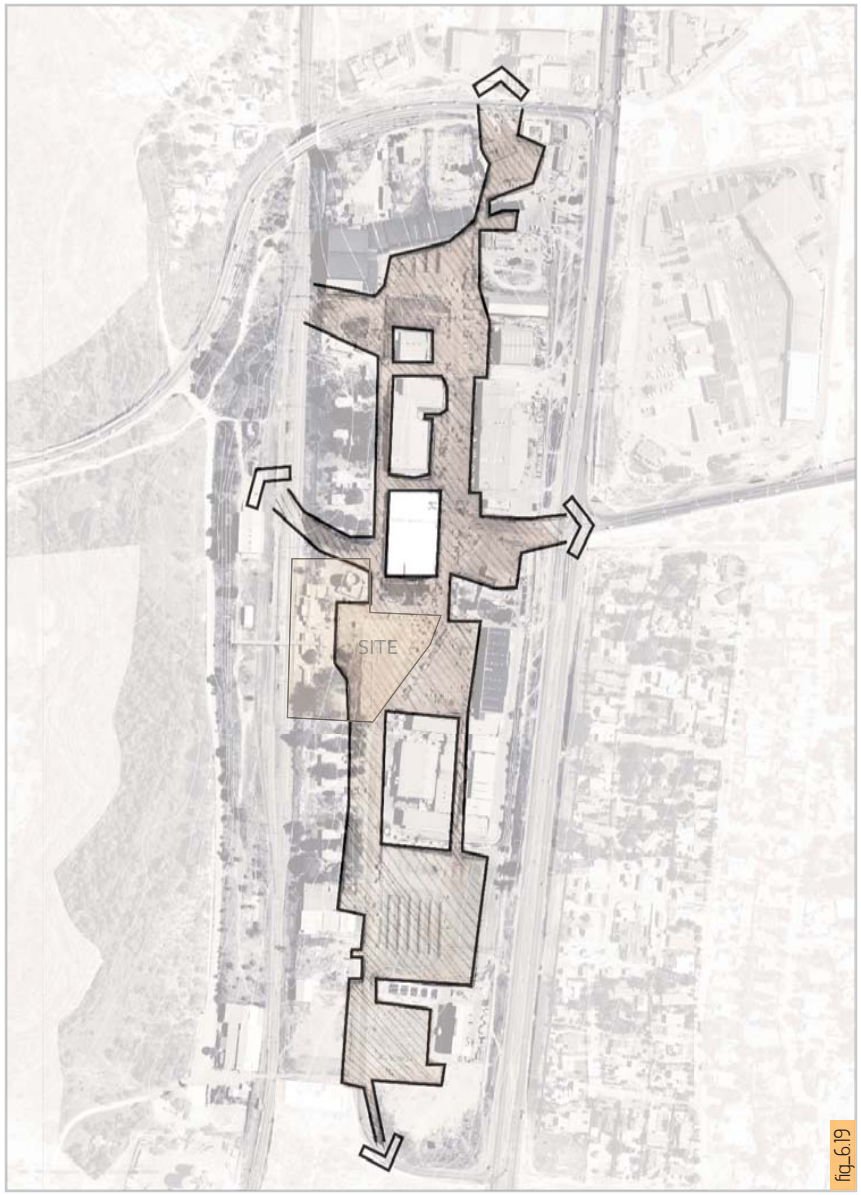




Not accessible to public

Accessible to public

**Fig_6.17**
Nodes and their connections to major form giving spaces and each other **[Author, 2012]**

**Fig_6.18**
The permeability and accessibility of buildings on site **[Author, 2012]**



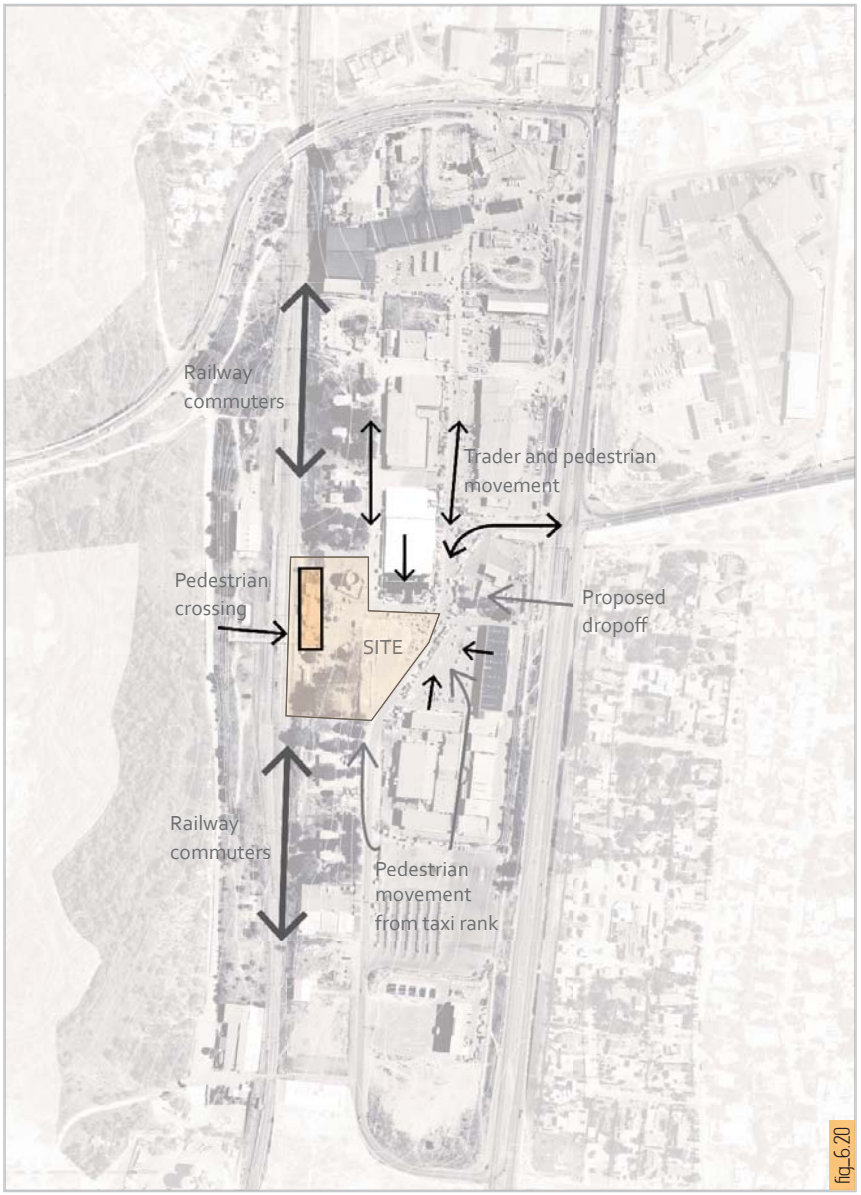
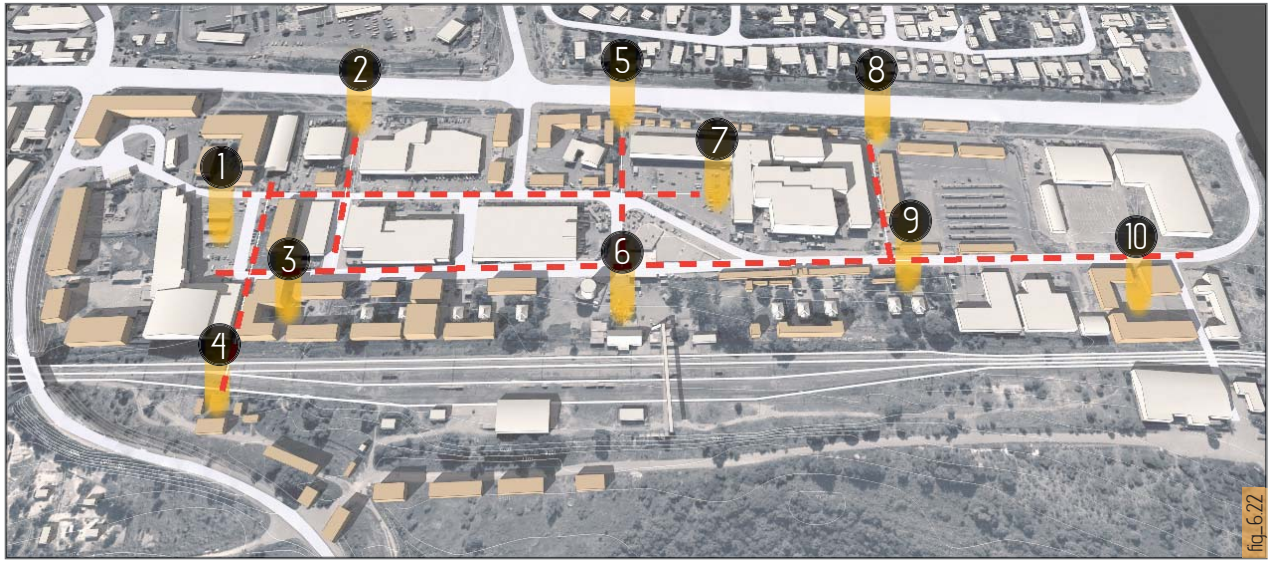




**Fig_6.19**
The current outdoor public realm of the site **[Author, 2012]**

**Fig_6.20**
Connections and routes that directly affect the proposed dissertation site **[Author, 2012]**


## 6_03 Proposal for site development

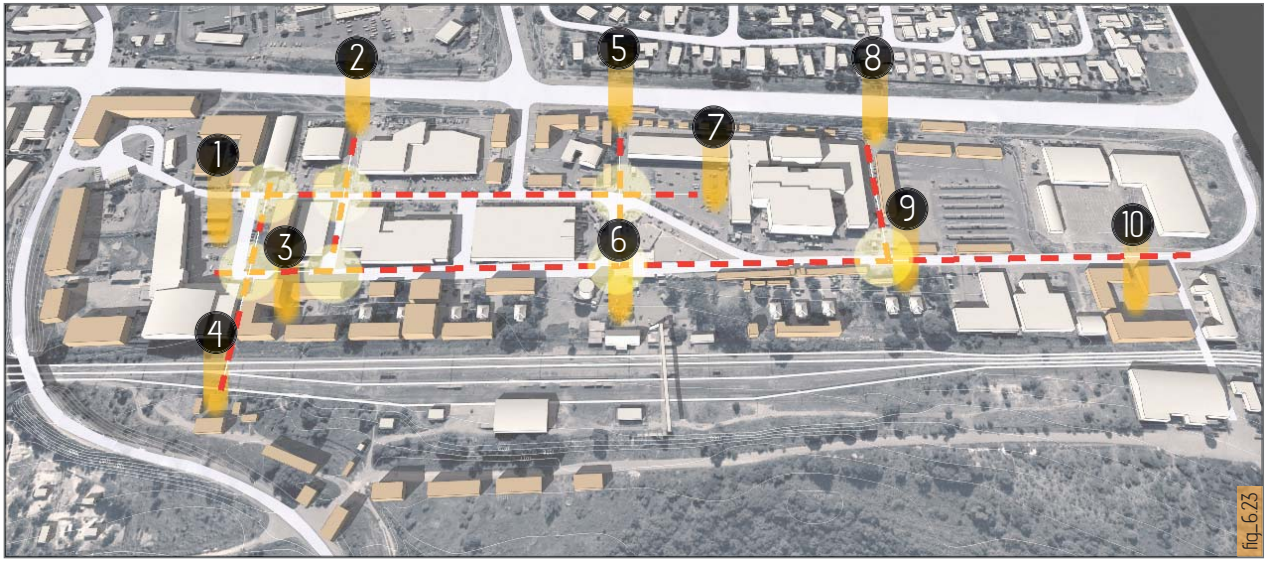
The development of the site is envisioned by the author as a four step plan. This will ensure that future development of the site happens along guidelines set up by the author.

The first of these steps is the establishment and incorporation of strategically placed nodes. These nodes are either existing or proposed and are placed along well travelled routes, either by vehicle or pedestrian.

1. This existing commercial node has the potential to increase in density.
2. Drop off node for taxies. Light retail opportunities.
3. Office node with recreational and light retail opportunities.
4. Retail and civic potential. This node becomes a focus point for the proposed route across the railway tracks.
5. Drop off node for taxi's. Light retail opportunities.
6. Major civic and retail node. The importance of this node is emphasized by the high concentration of informal trading activity and the transport aspect in the form of the railway line.
7. Kopanong mall. Existing commercial node.
8. Drop off node for taxi's. Light retail opportunities.

**Fig_6.21** Areas with potential higher energy within the block are identified or established **[Author, 2012]**

**Fig_6.22** Routes between the nodes are established and emphasized **[Author, 2012]**





9 Small scale civic and recreational activity

10 Office node

The nodes become focus points for step two, which is route establishment. These proposed routes are derived from links between the nodes and some are along roads and walkways already being travelled by pedestrians on a daily basis.
Step three is the emergence of trade or other activities at the intersection of the routes between nodes. These are seen as hot spots for informal activity as they are passed by various actors of the urban context, being trader, commuter, business men, school children and so forth.

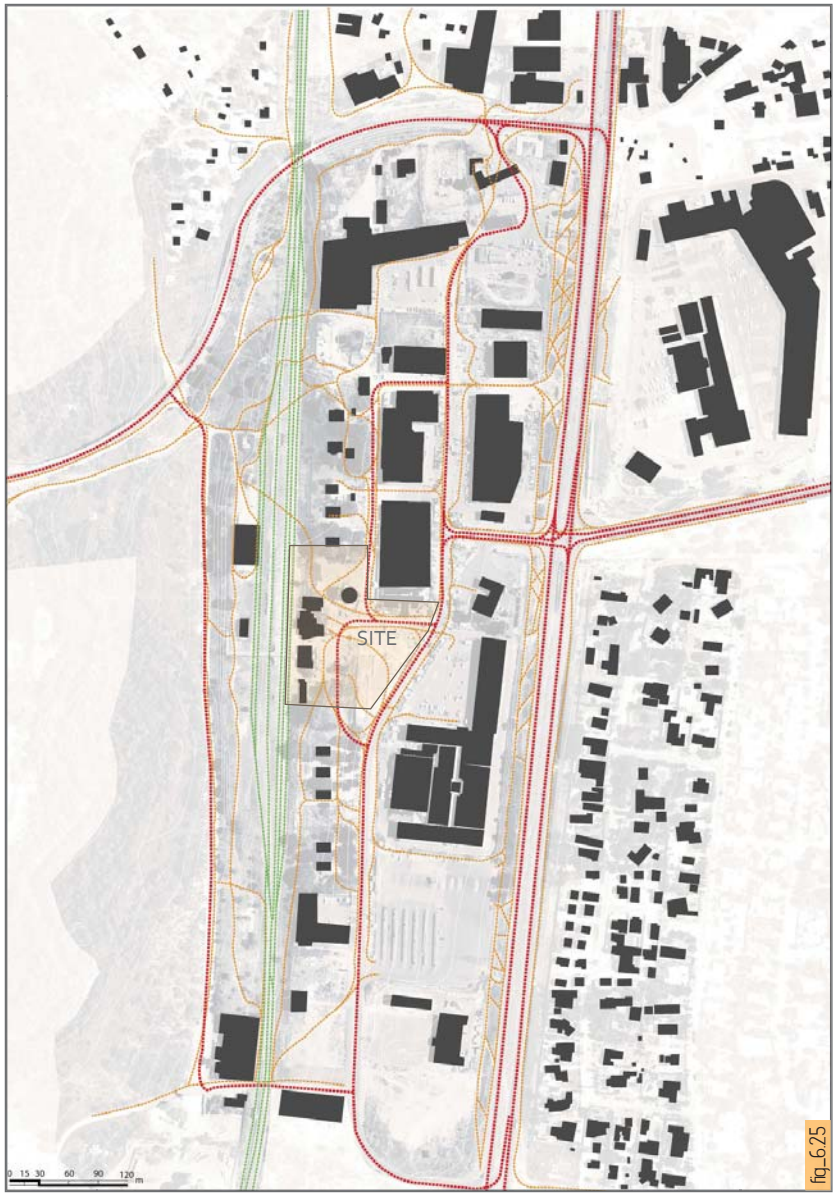
The final step will be the densification of the areas next to the routes and between nodes and intersections. Many of these spaces already contribute to the socio-economic realm in the area. With more density of socio-economic activity the economic impact of these areas could have a larger effect on the surrounding community.

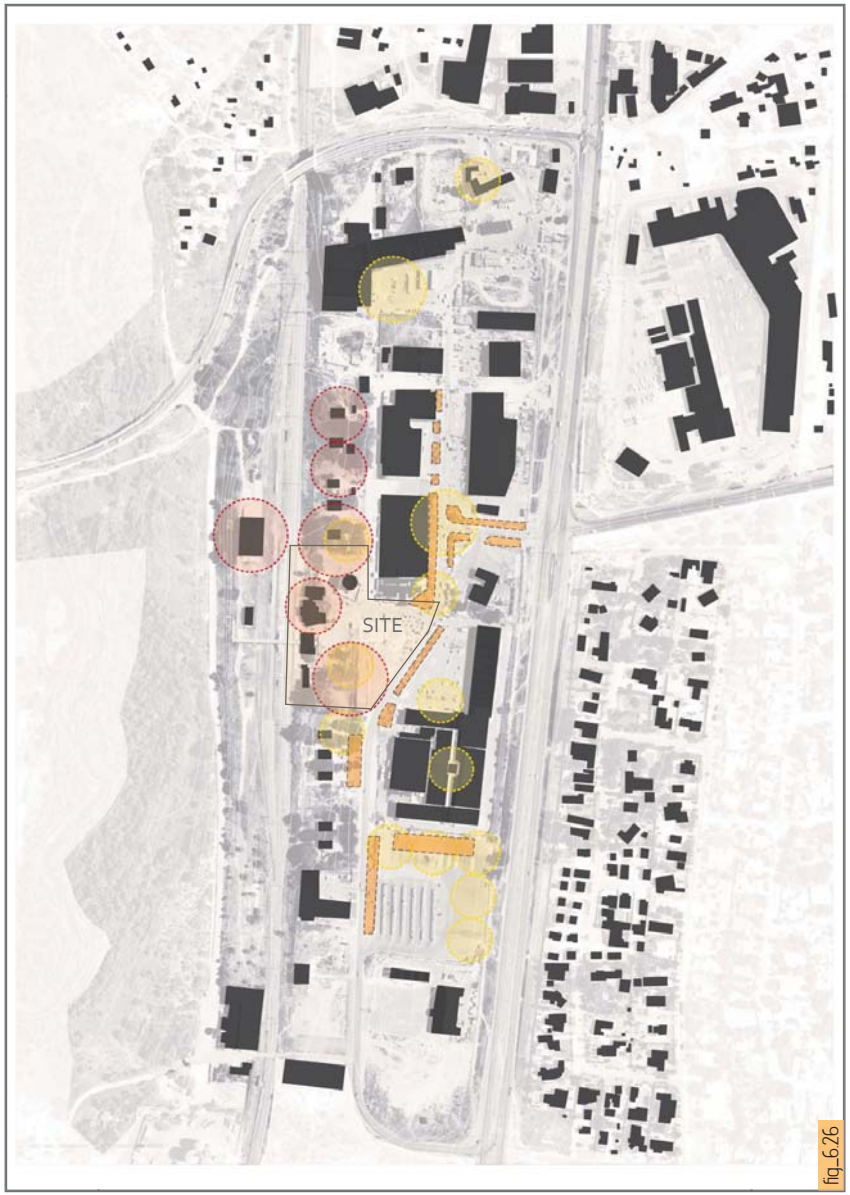
Density, in this case, could be defined not only as the physical mass of buildings but more as the increased number of activities available to the public. Activities could include trade, recreational areas, public amenities and or civic entities.

These four activities mentioned above are incorporated into the dissertation design project . The aim is to provide a multi- functional node, shown on the previous page as node 6, with a varied programmatic response to the complex urban conditions of the area.

**Fig_6.23** Where routes cross more emphasizes is placed on the intersection development **[Author, 2012]**

**Fig_6.24** The routes between the nodes will be developed to maximise their potential **[Author, 2012]**




Railway tracks

Pedstrian routes

Vehicular routes

High pedestrian activity

Criminal activity hotspots

Informal trading activity

**Fig_6.25** Existing pedestrian and vehicular routes through and around the site **[Author, 2012]**

**Fig_6.26** Various forms of pedestrian activity in and around the site **[Author, 2012]**

**Fig_6.27** Hammanskraal commercial precinct with the disseration site shown in orange **[Author, 2012]**

"Public space at transit points offers great capacity for multi-dimensional placemaking: recreation, transportation and potential commercial spheres all merge in a cacophony of urban energy."
**Isichei, U. (2002: 7-15)**

fig_6.27

fig_701

# Chapter 7

# Architectural Programme



With the urban nature and scale of this dissertation as well as the theoretical premise of architecture as a social organizer and facilitator, an approach to the design needed to follow similar strategies and guidelines.

Kevin Lynch (1918 - 1984) provided seminal contributions to the field of city planning through research on how individuals perceive, organize and navigate the urban landscape. This research is published in arguably his most famous work, *The Image of the city* (1960).

Lynch (1960: 2-3) explained that urban users understood their surroundings in consistent and predictable ways, by forming mental maps of the urban environment with five principle elements.

The five elements are discussed in this chapter and forms key design generators for this dissertation.

**Fig_7.01** Dilapidated pedestrian bridge across the railway tracks **[Author, 2012]**


fig_702

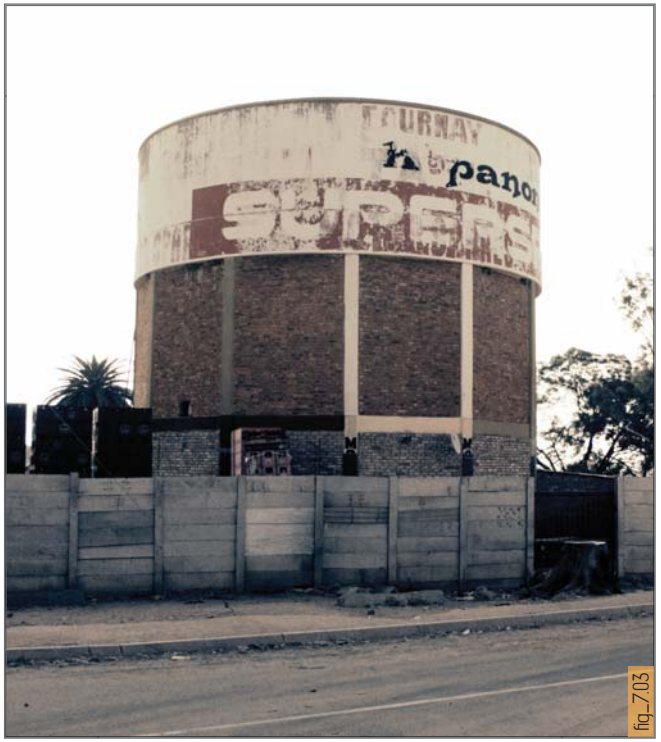


fig_703

# 7_01 Public urban landscape

Kevin Lynch in his book, *The Image of the City* (1960), identifies five characteristics of the perception by the public of urban imagery. Edwards (2011: 90) argues that although Lynch's work is more focused on an urban scale, designers of transport interchanges and transport buildings could follow the same rules. This will inform memorable transport experiences and spaces.

The five elements of district, landmark, node, path and edge, has to be translated to a smaller scale:

- District

Transport architecture and transport as a character has its own distinctive typologies and functions. This sense of distinctiveness gives transport areas its own personality and identification. Even though transport imposes its character on the whole, pedestrian movements add another layer to the already complex system. The transport district becomes the weaving of transport and people. See figure_7.02 for the transport district boundaries.

- Landmark

The interchange or station can become the landmark itself, but in the case of the Hammanskraal railway station, the station is designed around and through the old Hammanskraal railway station. The station and the interchange as a whole, aspires to become a new landmark in the Hammanskraal urban fabric. Elements like the water reservoir, figure_7.03, and the proposed chimneys become landmarks and beacons in their own right.

- Node

Lynch (1960: 47) describes a node as a placed entered where human and commercial use intensifies. The Hammanskraal station node and its function within the larger proposed urban framework is that of a transport node. With the increase of economic and social interaction, as proposed in the design, the station and interchange as a whole, becomes crucial nodes a landscape littered with micro nodes of socio-economic nature. Lynch (ibid) states the more the interaction, particularly social, the more memorable the space will become. See figure_7.04-07.


fig_704


fig_705


fig_706


fig_707

**Fig_7.02** Map indicating the commercial district of Hammanskraal **[Author, 2012]**

**Fig_7.03** The iconic water reservoir adjecent to the railway station is a visual landmark in the precinct **[Author, 2012]**

**Fig_7.04** A resident pushing goods in a trolley **[Author, 2012]**

**Fig_7.05** Taxi drivers in the Kopanong taxi rank **[Author, 2012]**

**Fig_7.06** Exchange of goods between residents **[Author, 2012**

**Fig_7.07** Informal trading activity around the Checkers opposite the Hammanskraal railway station **[Author, 2012]**

- Path

Path is one of the most fundamental elements in the transport experience and perception. Paths can be on foot, by car or by public transport, and the experience is enhanced when these are mixed and interacting. Compared to a coarser grain of perception experienced when using public transport, more detail is absorbed when walking. It is through this example that we can argue that we gain knowledge of spatial geometry via the route we take and at the speed we take them. Because routes are the main vehicles for navigation knowledge, they have to be design as memorable spaces. Edwards (2011: 92) states there is little pleasure in using interchanges, without memorable routes.

- Edge

Edges, according to Lynch (1960:47), are the boundaries of perception and are often formed by transport barriers from one form to another. The railway line at the Hammanskraal station, figure_7.09, can be seen as such a barrier. The role of the interchange, or in the case of the dissertation – the station, is to bridge the boundary condition. In the Hammanskraal transport node a physical bridge across the rail is provided, where commuters can drop down to the tracks and other users can cross as a normally. This allows perception to cross the physical barrier.

Along with these guidelines set out by Lynch, the design will be approached in a minimalist manner. The author, as designer, aims to create designs which will have a maximum impact on its surroundings, particularly socially, while only utilizing the minimum needed elements and intervention.



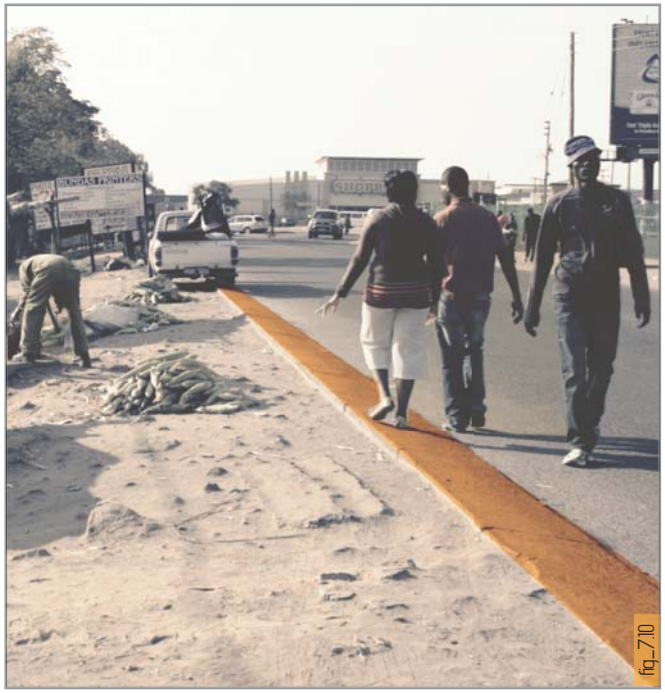



**Fig_7.08** Population of an informal path that formed naturally due to pedestrian traffic across the railway tracks **[Author, 2012]**

**Fig_7.09** Railway tracks form a strong physical barrier west from the site. The pedestrian bridge allows pedestrian traffic across the railway tracks **[Author, 2012]**

**Fig_7.10** The street kerb forms a threshold or edge between vehicular and pedestrian traffic. The edge is further emphasized by the difference of materials, natural and man-made **[Author, 2012]**


fig_7.11


fig_7.12


fig_7.13

David Dewar defines the significance of minimalism in his article, *The Relationship between Spatial Planning and Transportation Planning in Southern Africa and its Consequences for Human Settlement* (2011). He states it as the provision of the minimum strong actions necessary to give direction, while allowing maximum freedom for the ingenuity and creativity of role players to enrich the emerging reality.

Dewar (2011: 968) proposes three reasons why minimalism is a valuable approach, especially in environments where complexity results from the process and not design:

- Minimalism is the attribute that allows plans to deal with unexpected events.
- Minimalism is qualitative where sterility and monotony is the result of too few role players dominating the design process. Dewar quotes the words of David Crane:

  "Create the city of a thousand designers"
  **(Crane, cited by Dewar,** ***ibid*****).**
- Processes of urban development provide opportunities for income generation and should be spread as widely as possible, especially in developing countries.

Positive plans should be plans of process. The plan needs to release land in such a way that a wide range of actors can be incorporated into the process **(Dewar,** ***ibid*****).**

**Fig_7.11** Map indicating structures related to railway associated programmes **[Author, 2012]**

**Fig_7.12** Map indicating structures related to civic and trade associated programmes **[Author, 2012]**

## 7_02 Design Components

This dissertation design consists of three main components which together will establish a civic transportation node in the Hammanskraal commercial precinct, effectively extending the central activity core of the precinct towards the railway station:

- The main focus element of the three is the railway station which aims to reconnect the township with its surroundings through more affordable and accessible public transport. The components associated with a railway station has been fragmented and spread around the site. This was done in order to create more meaningful outdoor space, while still creating natural commuter and trader circulation in the area. See figure_7.11.
- A multifunctional market area, consisting of various semi-formalized trading stalls and supporting programmes including a community clinic, pension payout point and post office, ATM and public toilets. The market space will also acts as the mediator between the square and the rest of the commercial precinct. See figure_7.12.
- Public spaces between the components act as connectors. From the station, it will act as a spill out and gather space for commuters and the general public. From the market space, it will act as an approach to the station and extension for informal trading activities. These connector spaces are aimed to facilitate interaction between different users and promote a sense of community.
  See figure_7.13.

**Fig_7.13** Map indicating public open space **[Author, 2012]**

## 7_03 Railway station

Transport buildings are recognized as an architectural typology of change. This typology as a whole has to deal with rapid changes in capacity over a single day, change in mobility technology ever few years, and stay responsive to new ticketing, information and passenger-handling systems. On top of all the external changes, these buildings are expected to be architecturally distinctive and offer high levels of passenger comfort. They are symbolic and physical gateways and can be consider as the most public of architectural typologies (Harbour cited in Edwards, 2011:15-16).

In his book *Sustainability and the design of Transport Interchanges* (2011), Peter Edwards, a Professor of Architecture at ECA, Edinburgh and the Royal Danish Academy of Fine Arts, School of Architecture in Copenhagen, explains the main goal of transport interchanges is to achieve pedestrian priority. The experience of travel is enhance and made more enjoyable when the traveller has the ability to perceive other modes of transport, read directional signs and walk through a building bathed in natural light. (*ibid)*

Some of the guidelines followed by the author in designing the railway station and its connection to a larger transport interchange are as follows:

- An interchange should be an uplifting experience in a welcoming environment
- There should be interest or attraction at arrival and departure points
- Natural light should be enhanced and enclosure reduced as illustrated in figure_7.14.
- Sightlines should be maximised to guide and orientate passengers. See figure_7.15.
- Transport modes should be seen and not imagine
- Safe and secure routes for pedestrians
- Integration of commercial space at main interchange spaces
- Formation of civic space around and between transport modes
- Ensure legible connections between transport modes and civic landmarks.
- Link interior and exterior spaces
- Provide tranquil and busy spaces
- Provide disciplined zones for retail (*ibid*: 52-53)

The following are passenger needs, identified by Edwards (2011: 65), which should be addressed in order to have a successful transport building or interchange:

- Safe and secure routes through the building
- Well-lit legible spaces and routes

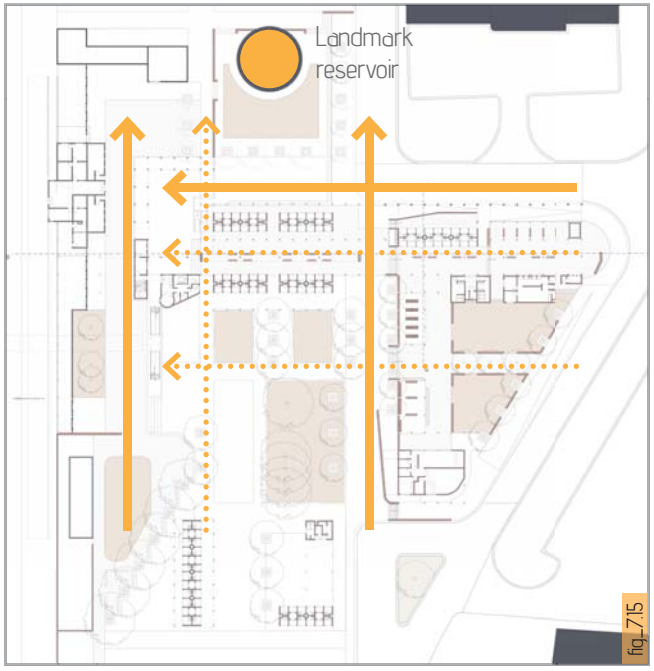




**Fig_7.14** Barnsley Bus Interchange in Yorkshire, by Jefferson Sheard, illustrates a high quality environment bathed in natural light **[Edwards, 2011:87]**

**Fig_7.15** Sightlines along major routes across the site helps with the legibility of the design **[Author,2012]**

fig_7.16


fig_7.17

- Clarity of transport mode geometries
- Clarity of signage
- Attention to disabled access and sense limitation
- Avoidance of level changes
- High quality materials within touching distance
- Attention to physical and psychological comfort [ibid: 65] Figure_7.16 is an example of a space with these qualities.

There are four programmatic priorities associated with the majority of public transport buildings or interchanges that have to be considered when designing these buildings:

- Travel and boarding
- Information
- Meeting
- Eating, reading and waiting

These spaces have been incorporated, throughout the design of the transport node, to cater to the majority of passenger needs, seen in figure_7.17. Secondary programmes are also included in the nodes design, to enrich the passenger environment and to achieve the cross programming and social interaction needed to establish the station and its surrounding as a social condenser.

**Fig_7.16** Concourse at St Pancras Station illustrates quite waiting areas and busy circulation space **[Edwards, 2011:91]**

## 7_04 Public market and traders

The main functions of these markets are to provide access of lower income consumers to commercial services and to provide economic exposure to the informal sector manufactures and traders. Unemployed citizens are given the opportunity to generate an income through a variety of small scale manufacturing, service and trading activities.

Benefits of public markets:

- The provision of central trading locations for small operations
- Higher concentrations of small traders can compete with larger commercial establishments
- Management of problems associated with individual street hawkers. These include disruption of traffic, littering and health hazards.
- Providing a high level access and distribution of goods to lower income areas

Elements associated with markets:

- Lock-up stalls

Formal stalls located within market buildings, which are divided from each other, and can be closed and locked. Electricity can be provided to the stalls through metered connections, while water and ablution can be provided communally.

**Fig_7.17** An interior view of the covered walkway which illustrates the trader stalls on the edges **[Author, 2012]**

- Market buildings

These refer to structures which contains a group of stall spaces, offering shelter and security to traders.

- Shelter and stall infrastructure

These are the publicly constructed trading spaces, usually constructed from cheap, readily available materials such as timber, corrugated iron or concrete blocks. The basic stall infrastructure can be upgraded by expanding selling surfaces and creating storage.

- Basic level of market infrastructure

The main trading surface should be a hardened material which does not absorb fallen fluids and prevents the formation of dust and mud. Furthermore, rubbish bins, public standpipes and trees are elements that should be considered. Trading space could be provided within public spaces or along road reserves [Watson & Behrens, 1996:211-212].

"A market building will operate best when it is closely aligned with street-based pedestrian flows, and there are entrances which allow passersby to penetrate the market easily"
**(Watson & Behrens, 1996:213)**

## 7_05 Public spaces

The main aim of the public or civic square is to provide a space for social interaction between various role players. Role players that would typically use this space may include pedestrians, cyclists, commuters, traders, children, homeless and a variety of other people that could benefit from such a space.

Christopher Alexander in his book, *A Pattern Language* (1977), explains the nature of positive outdoor space. He states that a space is viewed as positive when it has a distinct and definite shape, like that of a room, and when the space is viewed as important as the buildings that define it. For this reason, positive spaces are always partly enclosed or seem bounded Alexander (1977: 518-23). See figure_7.18 for an example.

According to Alexander people feel more comfortable in somewhat enclosed spaces, which he argues goes back to peoples more primitive instincts. Illustrated by a person looking for seating, he or she would rather choose a tree to lean their back against or a natural cleft in a cliff side, than sit in the middle of a square or exposed piece of ground.

It is vital that the design in the dissertation project incorporate adequate covered seating and resting space in the public square. Not only will this be done to provide shelter for people, but also to give the square a more pedestrian friendly and human scaled characteristic. See figure_7.19.



**Fig_7.18** A diagrammatic plan illustrating how the structures shape and define the public open space between them **[Author, 2012]**

**Fig_7.19** A view of the public open space created between the buildings in the civic urban lobby zone of the design **[Author, 2012]**


fig_801

# Chapter 8
# Design Development



**Fig_8.01** Existing storage facility on the western side of the railway line opposite the Hammanskraal station **[Author, 2012]**

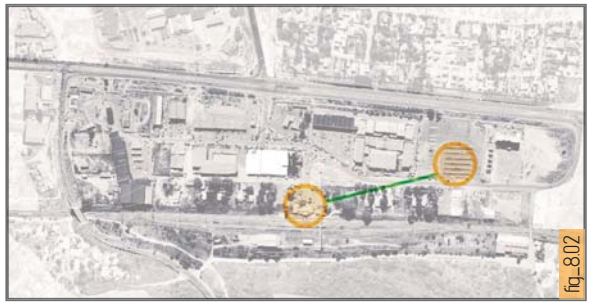


fig_8.02


fig_8.03

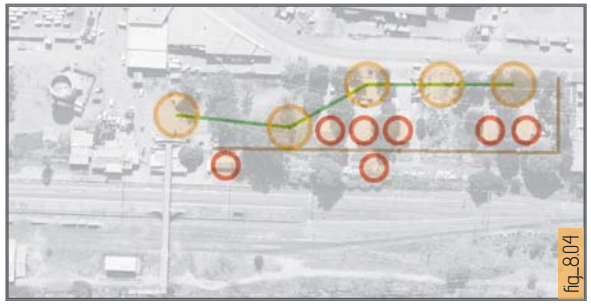

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fig_8.05

An objective of this dissertation is to create a series of buildings or structural elements in a urban landscape that houses various programmes, mostly social in nature. These social programmes possess a civic nature which contributes to the character of the proposed transport node located in the Hammanskraal CBD.

These programmes arose out of a necessity for a civic space in a Hammanskraal. The creation of a new civic node, combined with a transport mode, intends to stimulate socio-economic activity in the area.

Along with the buildings the project focuses on the public space surrounding them and how it informs and benefits these programmes. The buildings become focal points in the urban fabric and contribute to the spatiality and the public sphere of Hammanskraal. From various visits to the study area, the author concluded that well designed public space in the area was under developed or totally lacked in a majority of the township.

This chapter illustrates the evolution of the project throughout the study year. It aims to showcase how two different architectural typologies, route and object, are combined to create a hybrid building manifesting between the two.

A new typology is proposed that leans toward an object in the urban landscape, between existing context, and being heavily influenced by routes through and around the site. The concept of a route travelled between two points and informed by activities along the way is a design generator that is present throughout all the iterations of the design.

## 8_01 Route as architecture

A single line defines an interconnected system of points on a non-differentiated plain. A line can be expanded into a space; into a system of lines and spaces; and into a system of lines and spaces differentially connected. In the study area dealt with in this dissertation, the organisational and guiding qualities of the line is exploited in various forms on a site which shows the beginnings of an urban context (Dewar & Uytenbogaardt. 1995: 27).

### Line as a single entity



In an urban context, a line represents movement. This manifests in flows of people, goods and finances which forms the energy networks of urban systems. Urban activities which require greater public exposure gravitate towards the most accessible lines. The energy contained in lines is released through pausing and not movement; therefore lines which allow stopping has greater appeal. The success of a line depends on the community/ site it passes through as well as the two nodes on either side to which it is connected to (*ibid*: 27). See figure_8.02.

### Line expanded into space

At places where a line expands into space, the space becomes a holding area. The space operates as a point attracting high order activities and socially valuable institutions and facilities around it. By designing a generous space at these points unique and important events and facilities can be house in a celebratory manner (*ibid:* 28). See figure_8.03.

**Fig_8.02** Diagrammatic plan illustrating a straight line between two points in the study area **[Author, 2012]**

**Fig_8.03** Diagrammatic plan illustrating the expansion of a straight line into a spatial plane **[Author, 2012]**

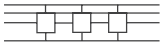
**Fig_8.04** Diagrammatic plan illustrating the expansion of lines into a series spatial planes along the lines **[Author, 2012]**

**Fig_8.05** Diagrammatic plan illustrating how lines and spaces can converge to for higher energy pockets **[Author, 2012]**

## System of lines and spaces

These system arises in more intensive situations, where there is significant through-traffic as well as marked attraction of activities to the linear system. Activities are located in order of importance. The highest order is located on the main route, some in and around the public spaces and other to the subsidiary route, accessible from the main route. [*ibid:29].*
See figure_8.04.

## Lines differentially connected



A number of interconnected modes of movement (pedestrian, vehicular, rail) are brought together into single corridors with structural opportunities possible. At places where all the different movement modes converge, key places, in this case civic spaces, can be created so higher order activities will gravitate towards them (*ibid*:30). See figure_8.05

The first design solution at this stage relies on the above mentioned definition and explanation of a line. The line would stretch between the old station and the new taxi rank to the south. Market spaces and other civic functions were to inform the route and thus establish a catalytic entity in Hammanskraal.

Criticism at this stage of the design was the scale of the project being to large, thus resulting in a project that is too fragmented to read as a cohesive entity. Apart from scale the project lacked focus and did not address the problems set out in the beginning of the year.

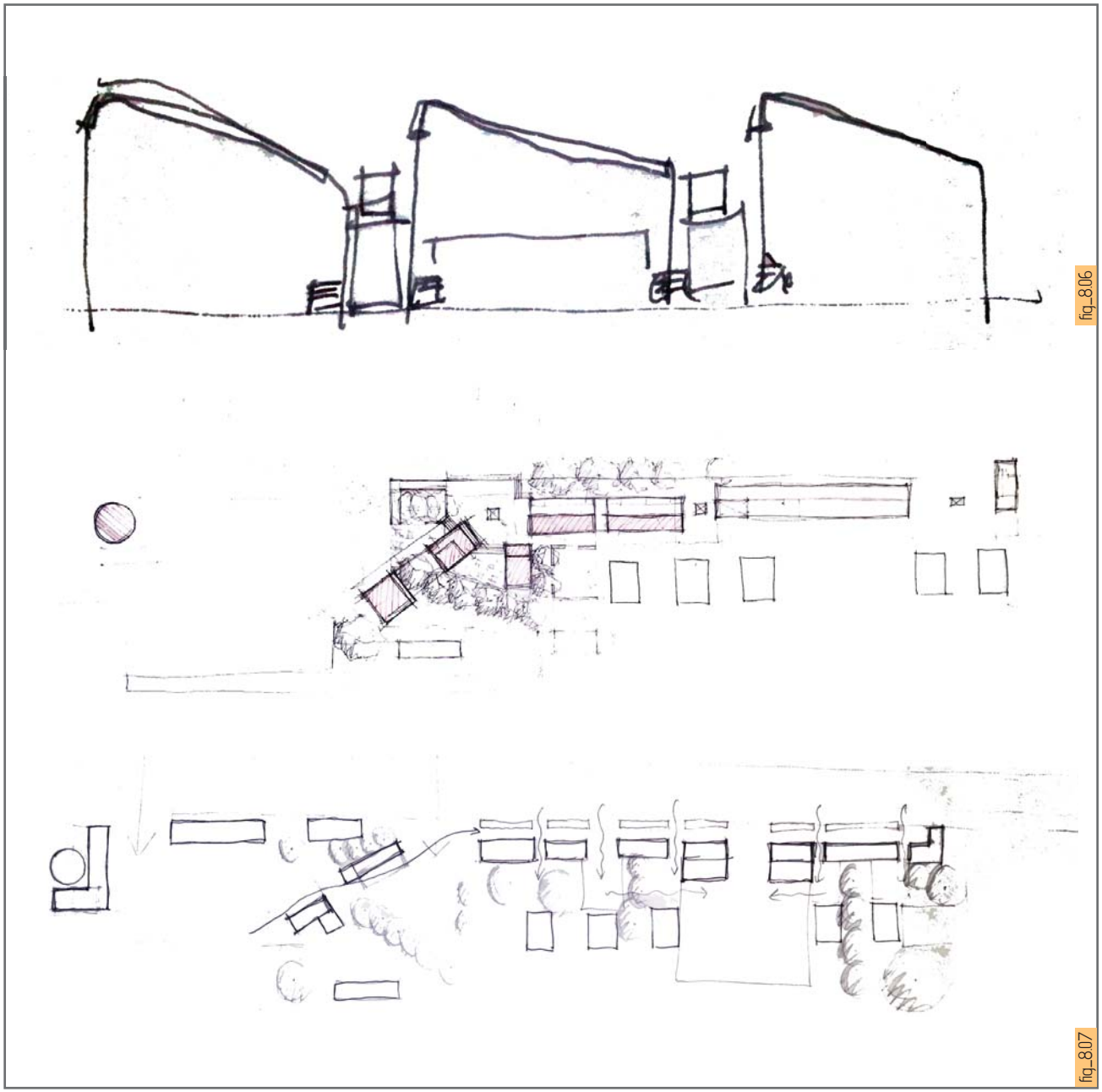
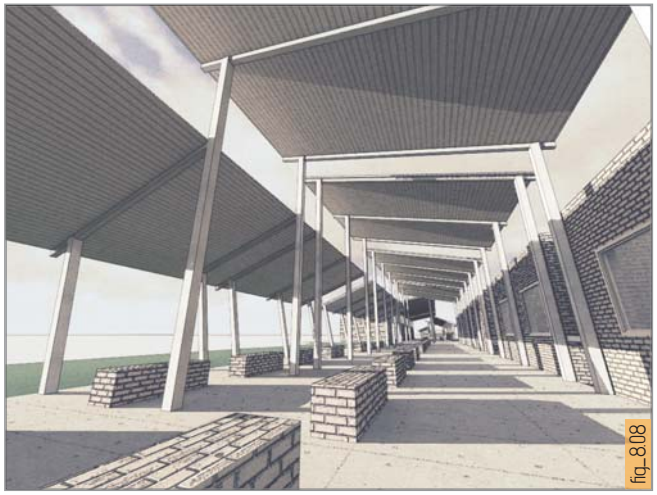



**Fig_8.06** Conceptual exploration of repeating roof structures along a route **[Author, 2012]**

**Fig_8.07** Conceptual exploration of massing and spatial interaction along a route **[Author, 2012]**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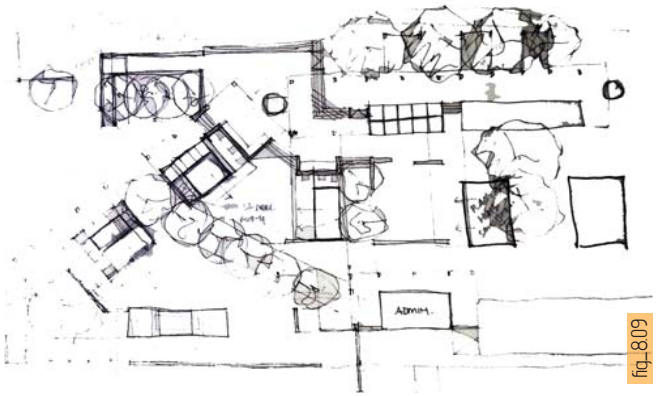

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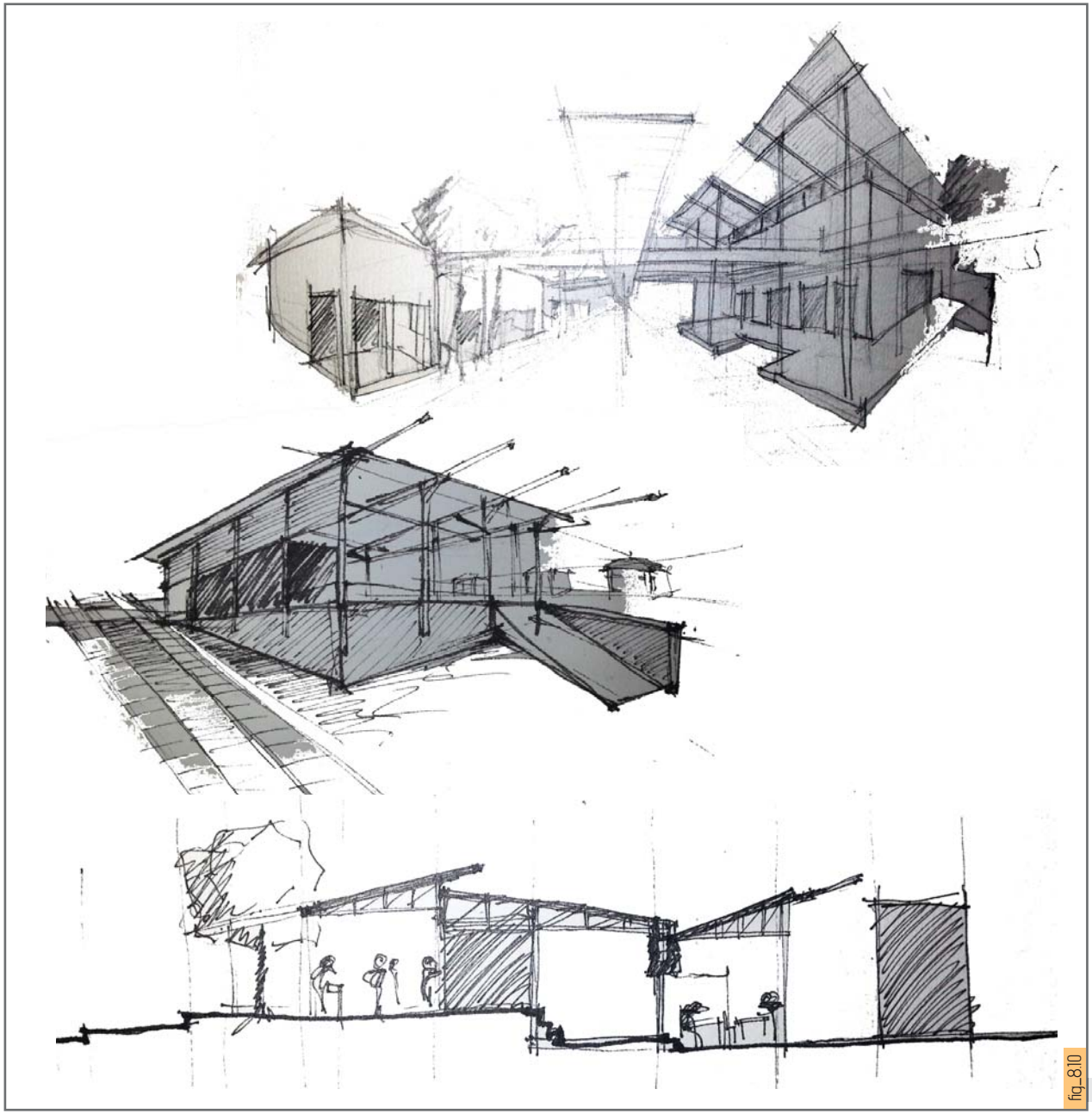


fig_8.10

**Fig_8.08** Three dimensional rendering of market space as a route **[Author, 2012]**

**Fig_8.09** Conceptual plan investigating spatial layout **[Author, 2012]**

**Fig_8.10** Conceptual exploration of section and architectural typology **[Author, 2012]**

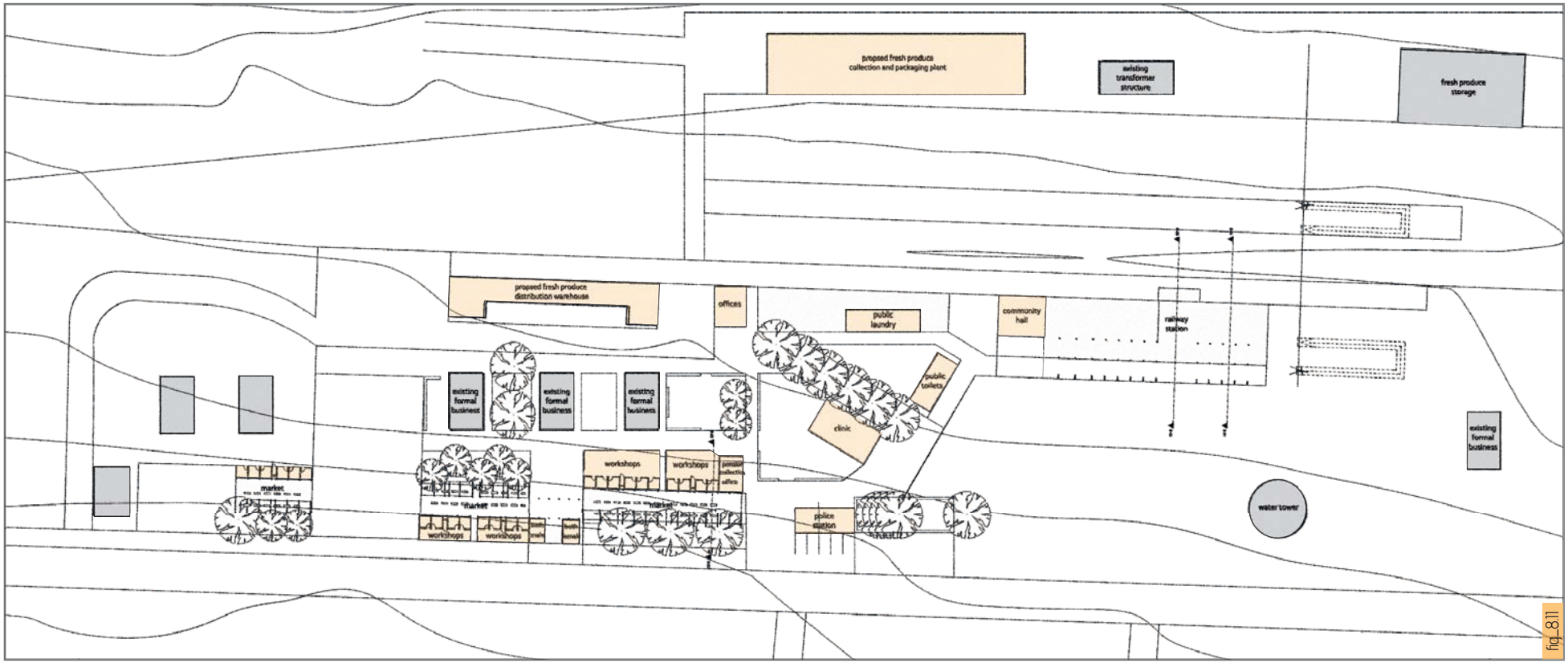
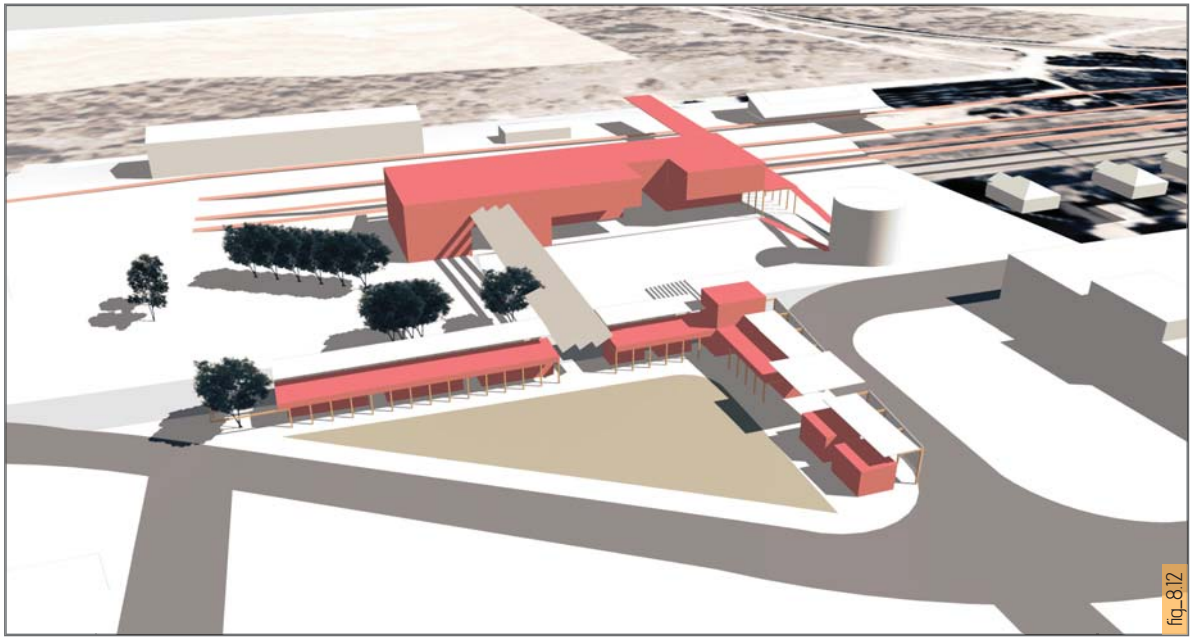



**Fig_8.11** Diagrammatic plan of the first design solution explored, namely architecture as a route **[Author, 2012]**





## 8_02 Architecture as object

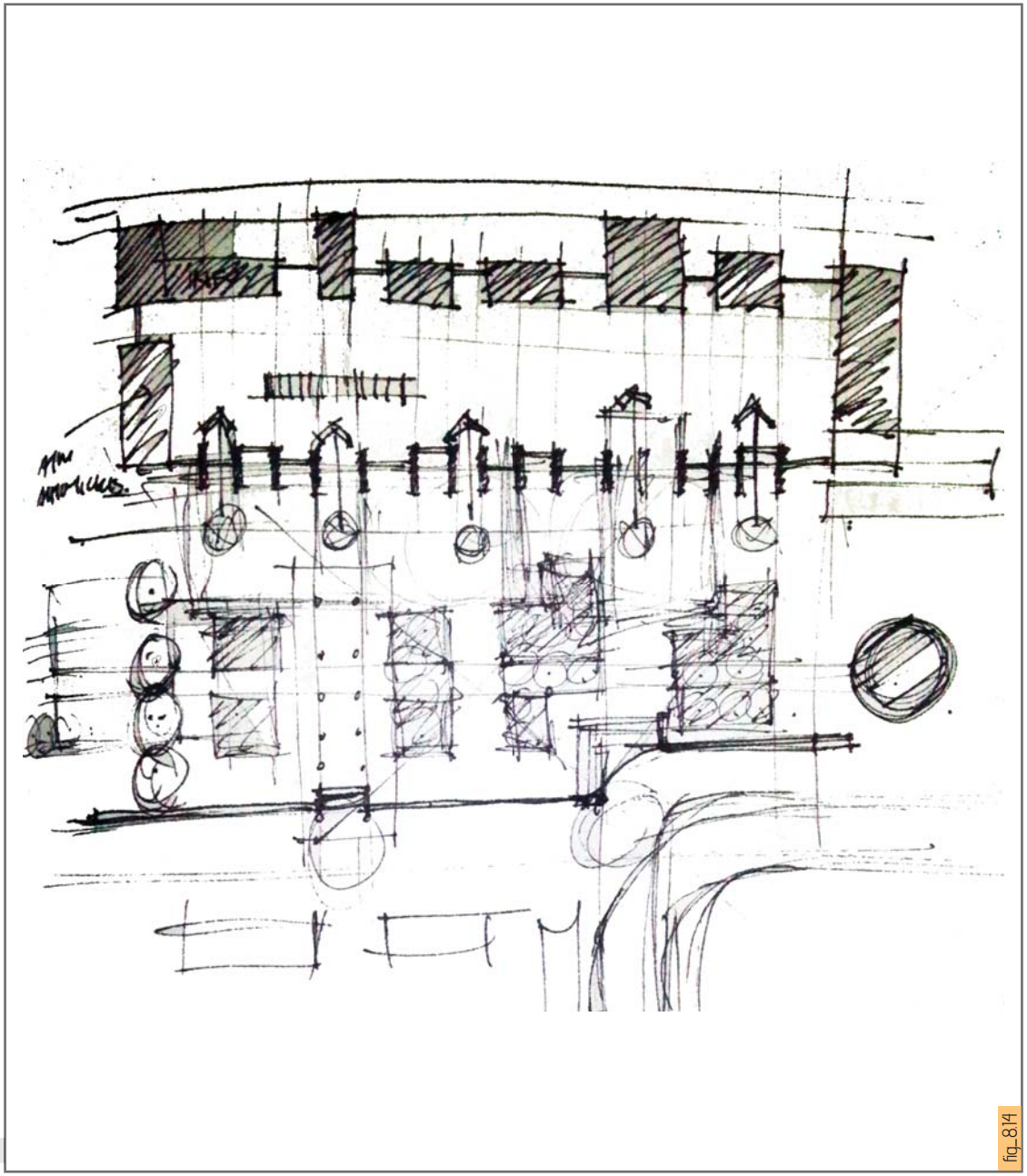
The second investigation into a possible design solution was to create an iconic building that would reactivate and reuse the non functioning railway station. This solution established a precedent of a building becoming a definite edge to the railway line. The building separated the transport mode, being the train, from a large public square. In this case, the railway station became an intermediate threshold between public and semi public spaces. This threshold space housed all the programmes associated with station. A secondary space, designed as an urban lobby, housed all the civic programmes. The public square in the design separate these two entities.

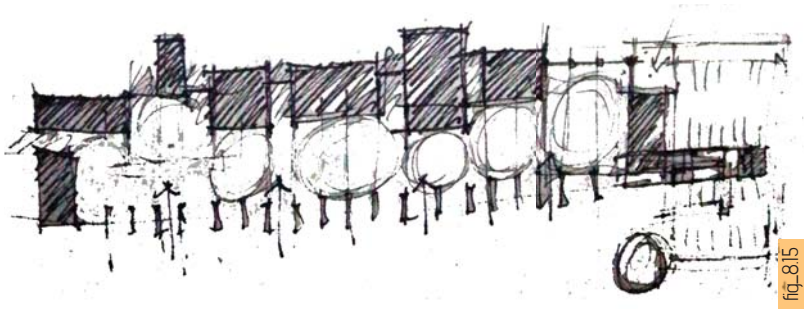
The lack of integration between the transport oriented programmes and the civic programmes resulted in a mono functional environment. Users of the different programmes will, in this environment, congregate around the spaces housing these functions. Integration and interaction with other urban users will be minimal which renders the theoretical premise of the dissertation not applicable. The large open square lacked the diversity and attraction needed to integrate commuters and everyday users with each other.

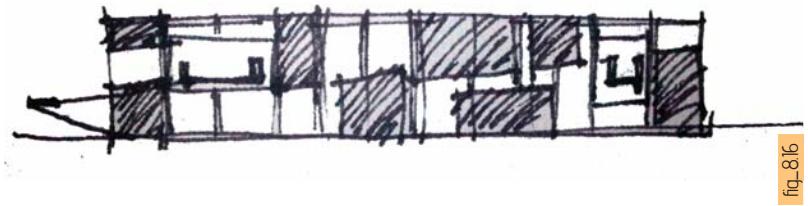
For a more successful solution, the concepts of place/object and route needed to be re-evaluated. The integration of the two would solve interaction problems between users as well as create new opportunities for interaction.

Criticism of the design at this stage was the lack of integration of the historic station. It was to be demolished in this solution with only the location and function of the station being respected in a heritage point of view. Figure_8.12-13 shows the massing models and spatial configuration of this iteration.

**Fig_8.12-13** Conceptual massing model of explored design solution - arctecture as object. Model shows the railway station linking to the urban lobby zone **[Author, 2012]**



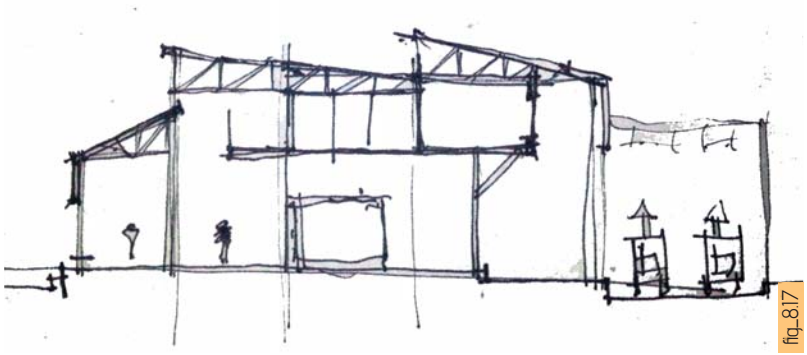
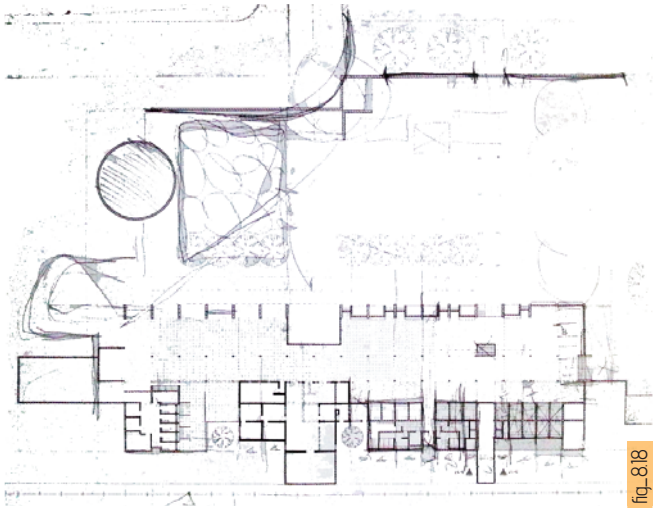




**Fig_8.14-15** Conceptual sketched plan illustrating massing, permeability and thresholds between interior and exterior **[Author, 2012]**

**Fig_8.16** Conceptual facade design **[Author, 2012]**

**Fig_8.17** Conceptual section exploration **[Author, 2012]**



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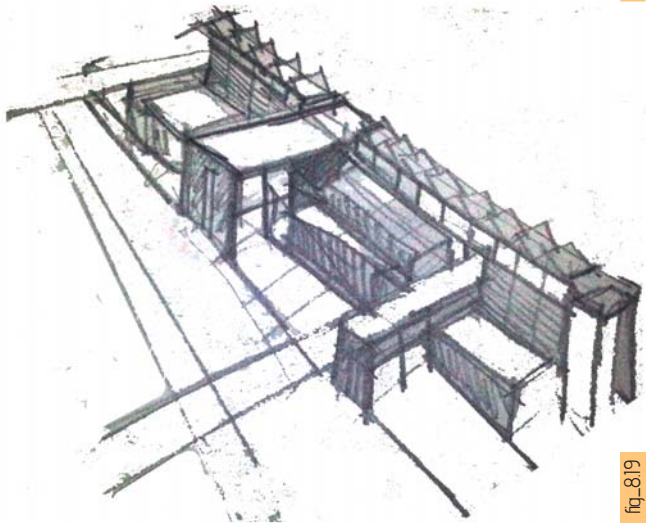

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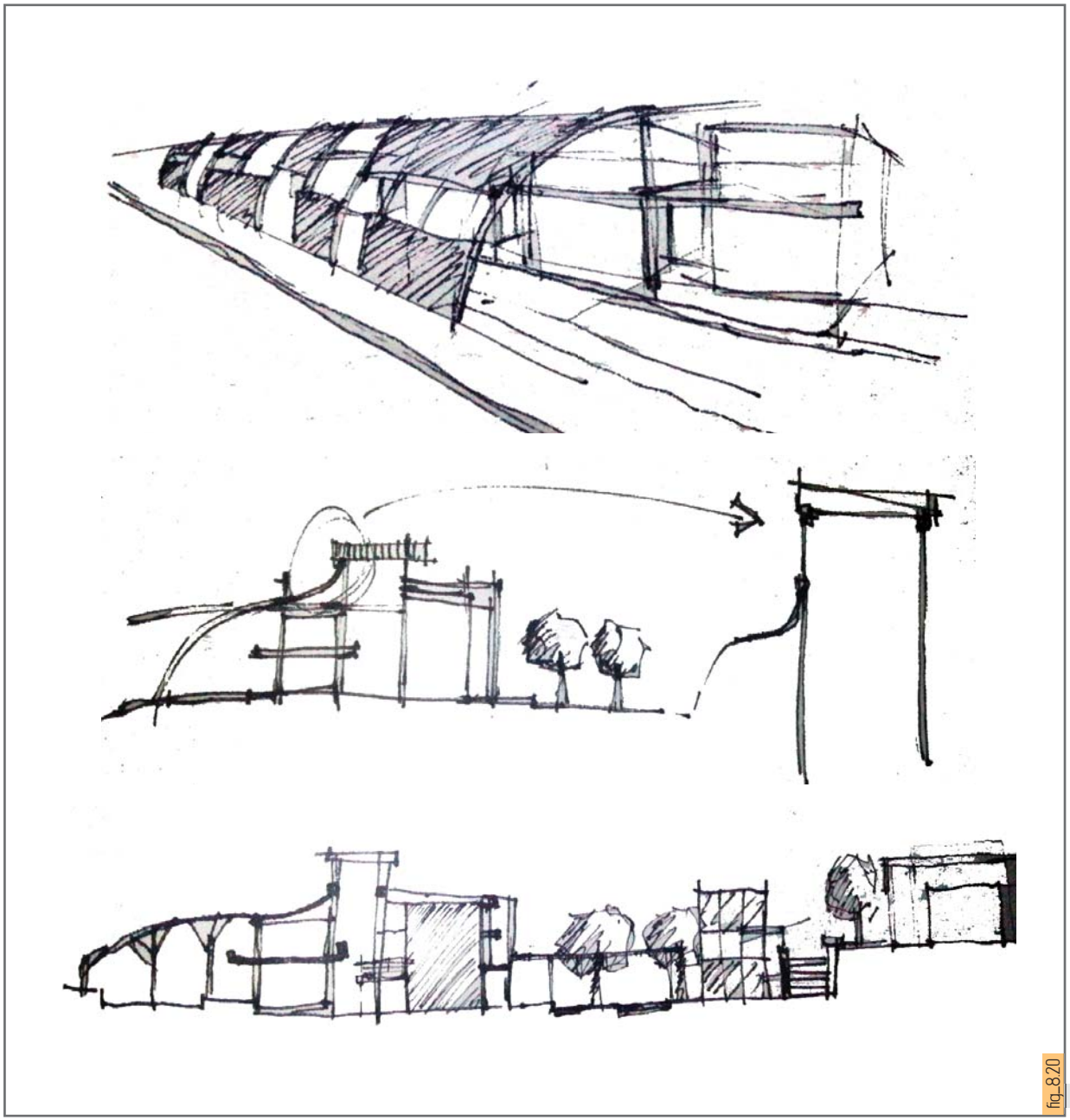

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**Fig_8.18** Sketch plan of railway station building [**Author, 2012**]

**Fig_8.19** Conceptual sketch of possible architectural typology for the station building [**Author, 2012**]

**Fig_8.20** Conceptual sketches of platform roof design exploration [**Author, 2012**]


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fig_8.24

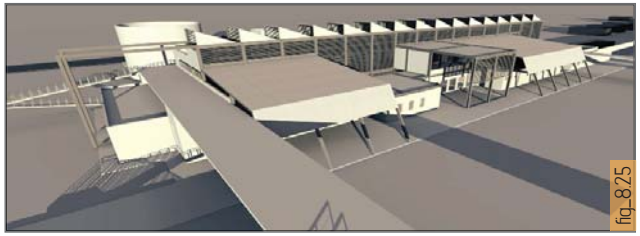
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**Fig_8.21-25** Conceptual renderings of the interior and exterior of the station building **[Author, 2012]**

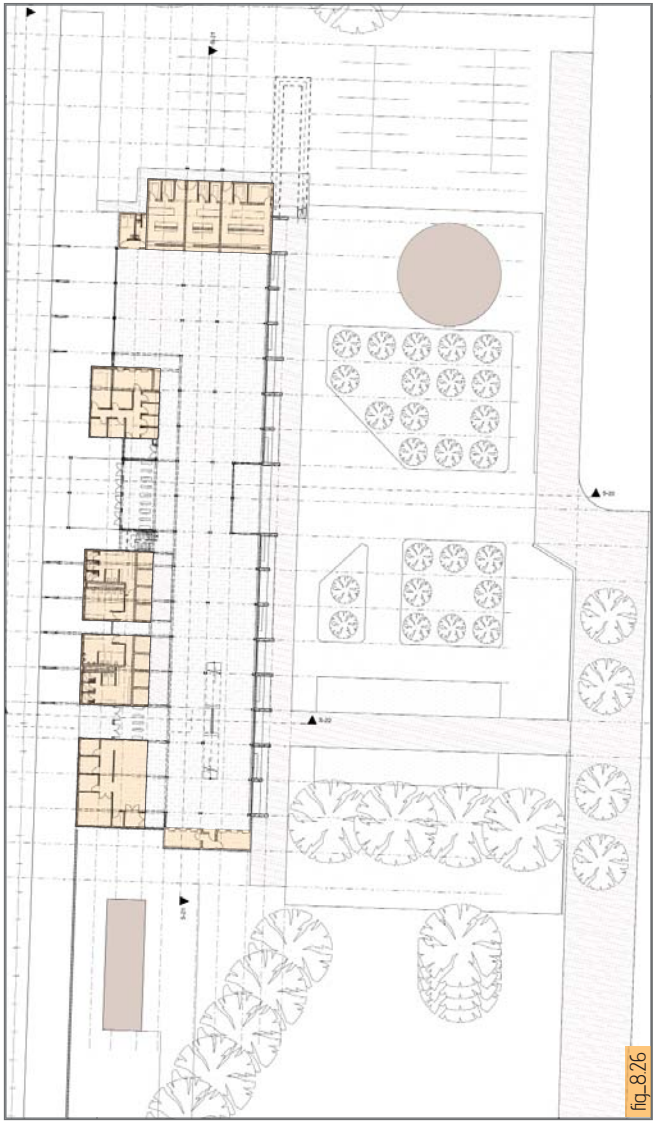
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**Fig_8.26** Sketch plan illustrating the final configuration of spaces for the railway station **[Author, 2012]**

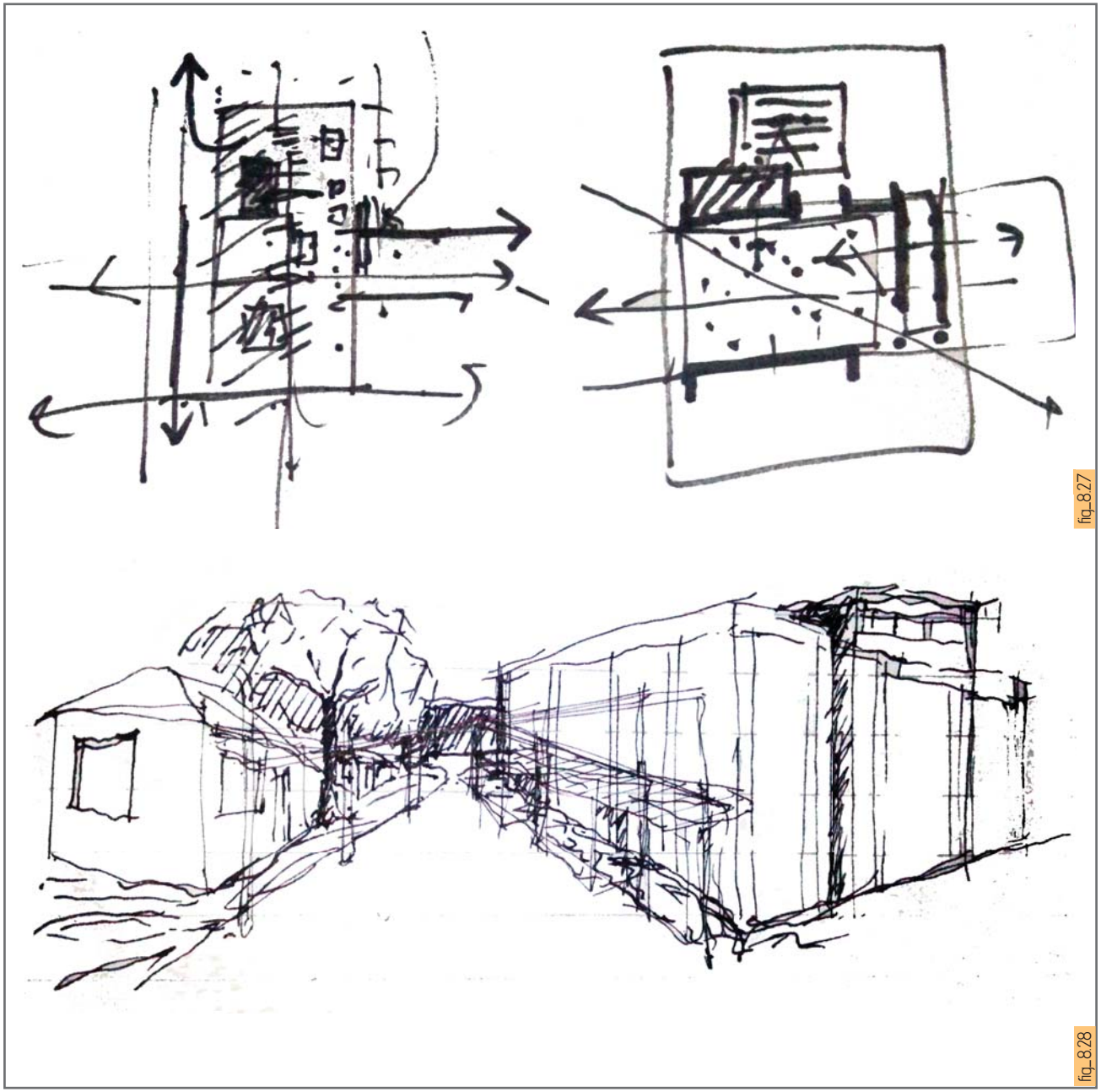

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fig_8.28

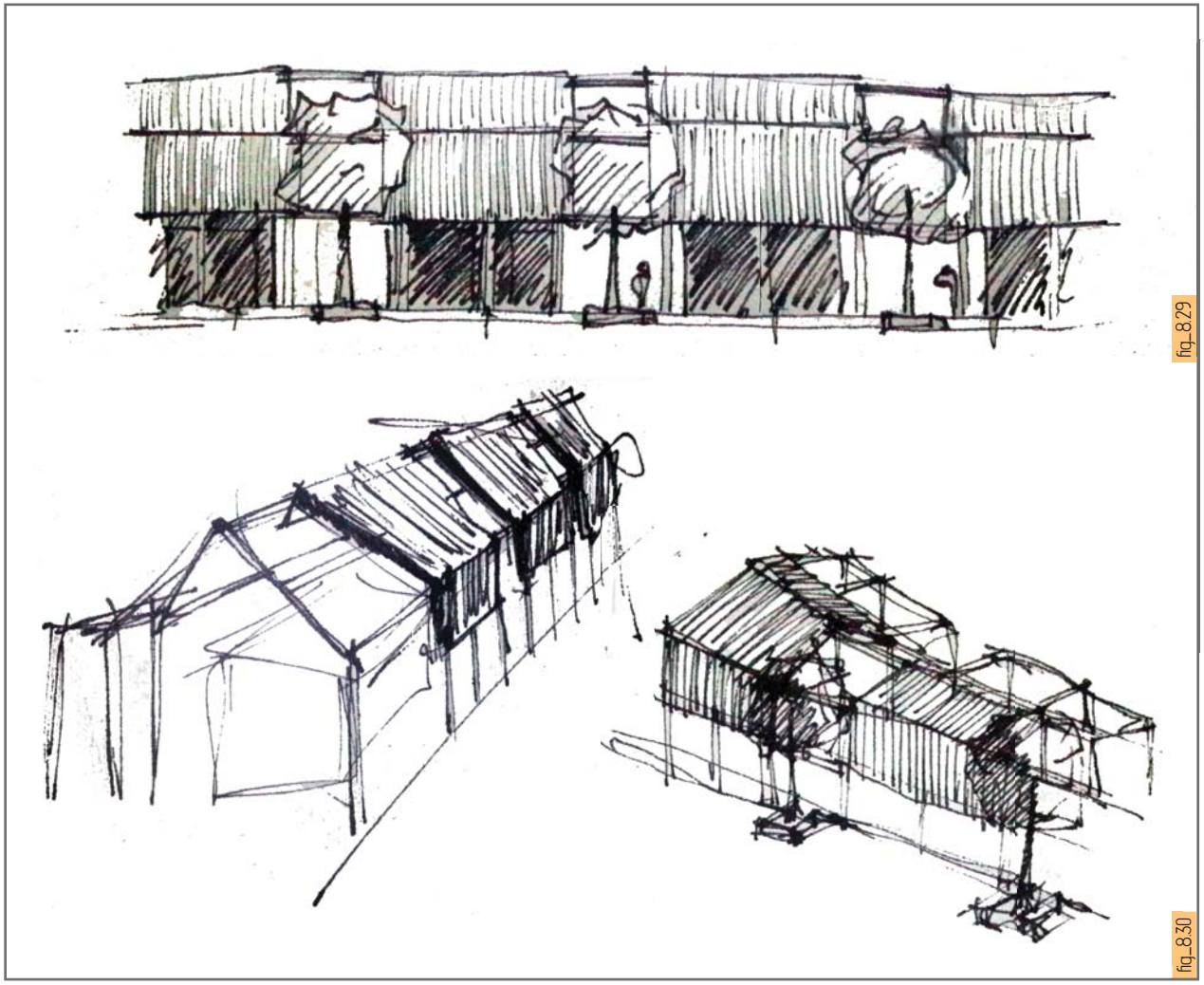
## 8_03 Architectural object informed by route

The third and final design solution investigated was the combination of the two previous attempts. The site was narrowed down from the first solution, only focussing on the station and the land to the east and south east of it. This allows for a design that is more focused and scale appropriate. In order to inform the final design, elements from the first and second design solutions were iterated. These elements are the idea of route as design generator, the building as a focal point informing the route, the building as iconic element to give the it prominence in its surroundings and the use of public space to enrich the journey from point A to B.

The design evolved into a framed structure along the major route towards the station from the current CBD of Hammanskraal. Elements such as the trading stalls were designed in a modular fashion for ease of construction and repetition around the site. Stalls were also placed along the route towards the taxi rank to promote trade in that direction. This is done to tie the project into a possible second phase of design. The market along the taxi route proposed as the first design solution could evolve naturally as a result of the newly create transport node. With two key transport modes, train and taxi, on either side of the site, activity is bound to emerge between them.

**Fig_8.27** Conceptual diagrammes investigating routes and links through and towards the study site **[Author et al, 2012]**

**Fig_8.28** Conceptual sketch of the road between the historic railway houses and Checkers **[Author, 2012]**



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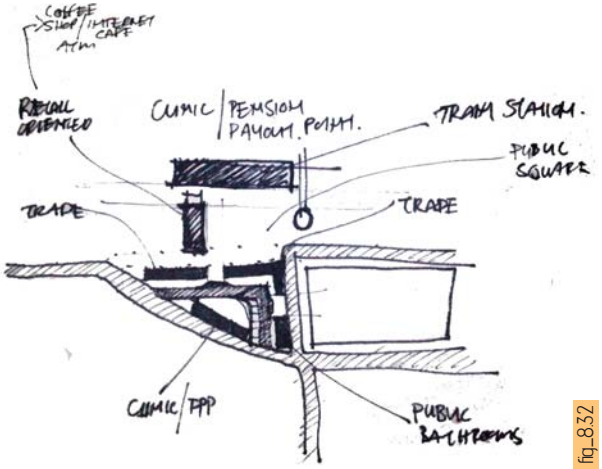


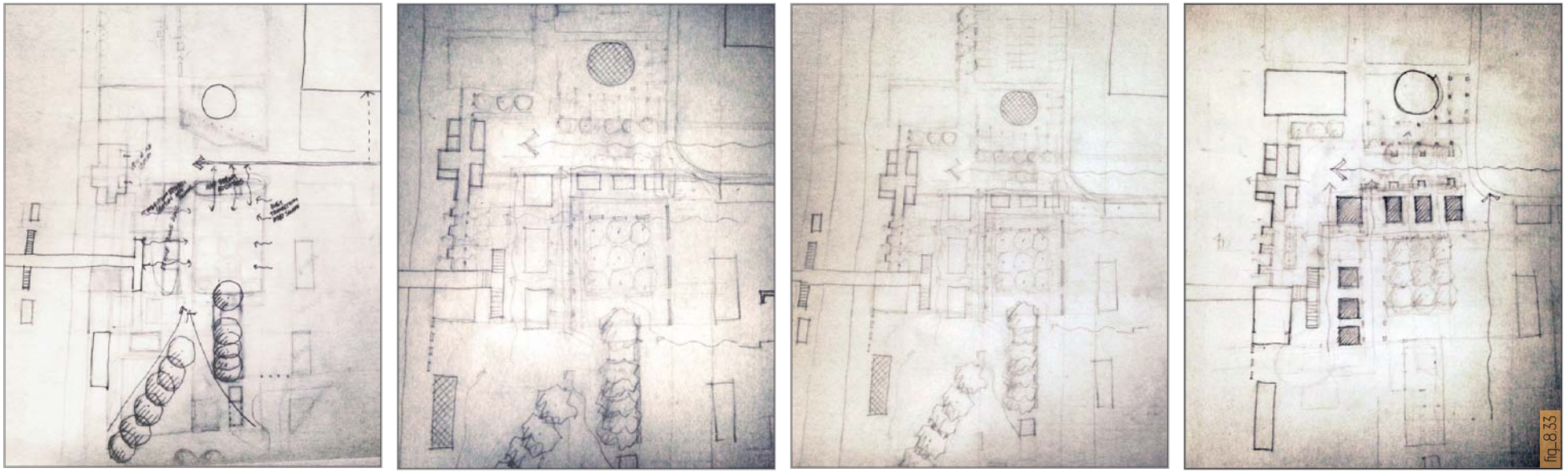

fig_8.32

**Fig_8.29** Conceptual elevation exploration of the market structure [**Author, 2012**]

**Fig_8.30** Investigations into a framed structure as an architectural typology [**Author, 2012**]

**Fig_8.31** Diagrammatic plan of the approach to the old station [**Author, 2012**]

**Fig_8.32** Diagramme investigating the location of programmes [**Author, 2012**]



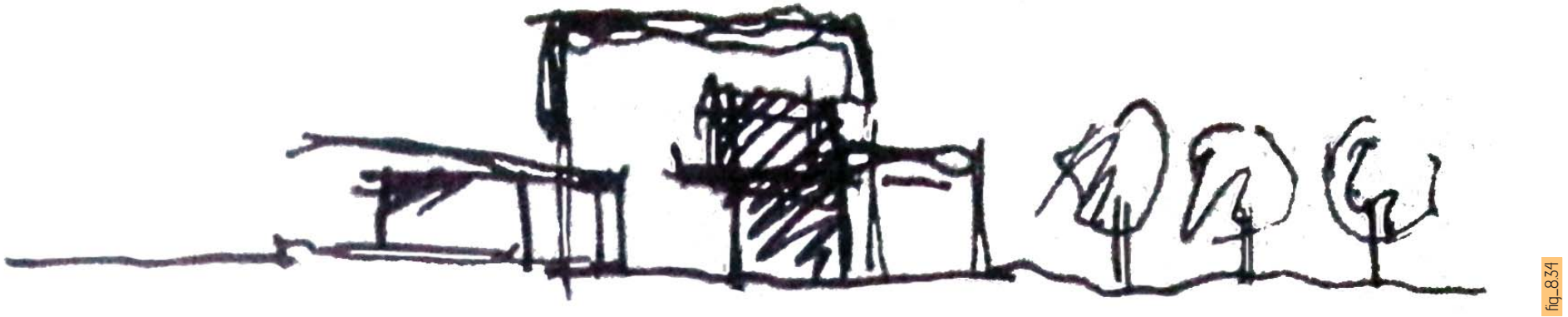




**Fig_8.33** Conceptual diagrammatic plans of the site layout **[Author, 2012]**

**Fig_8.34** Conceptual section sketch **[Author, 2012]**

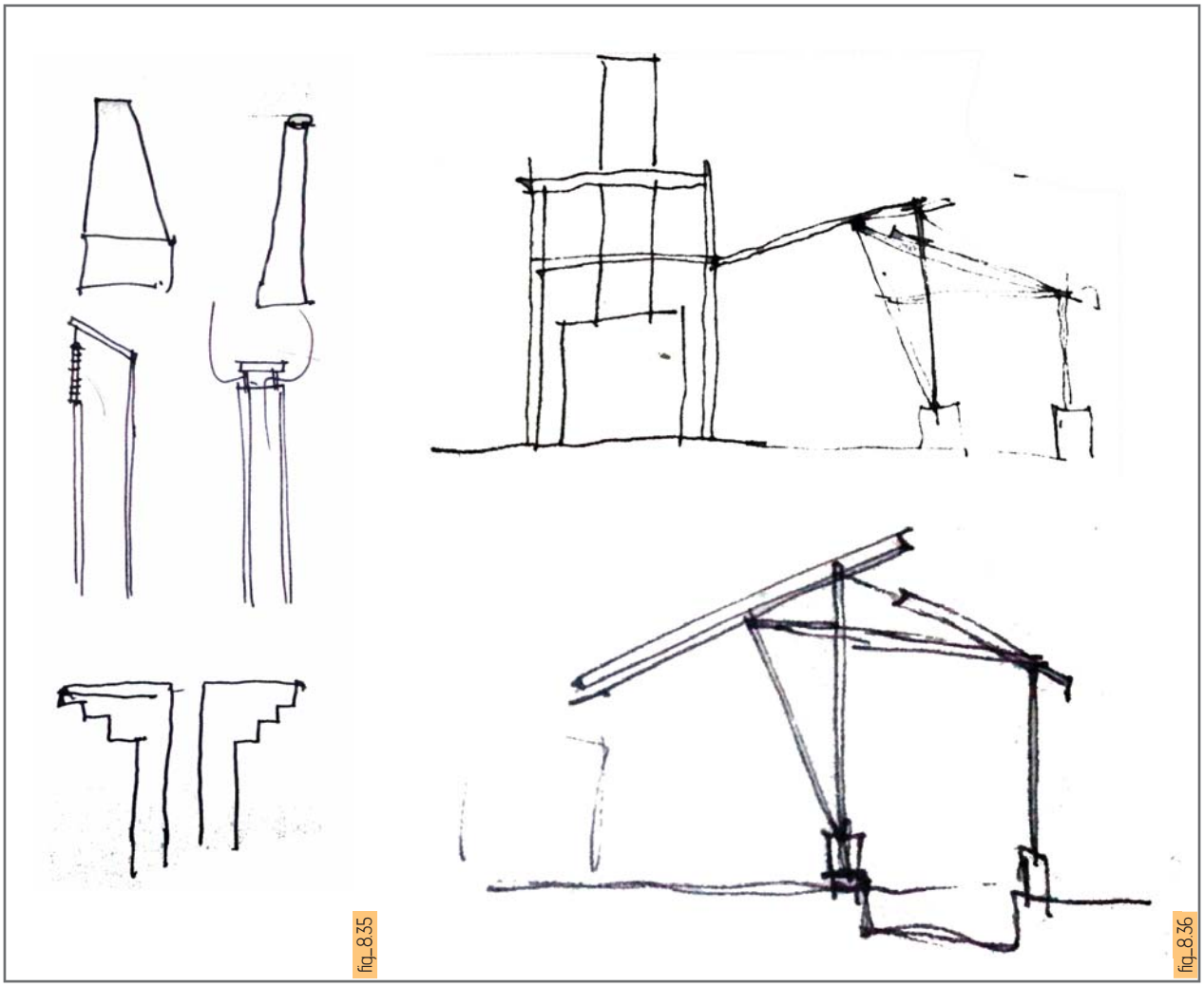
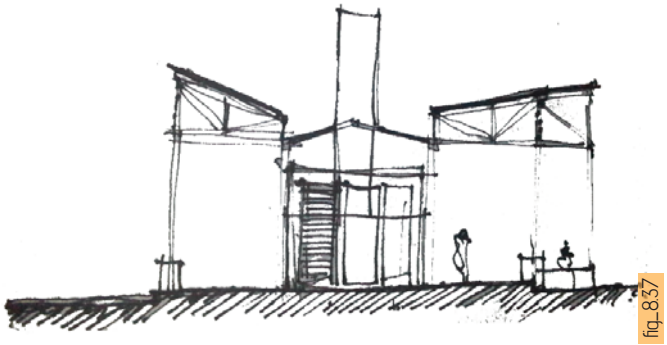


fig_8.35

fig_8.36

**Fig_8.35** Chimney design explorations [**Author, 2012**]

**Fig_8.36-39** Sketches illustrating section investigation and evolution [**Author, 2012**]



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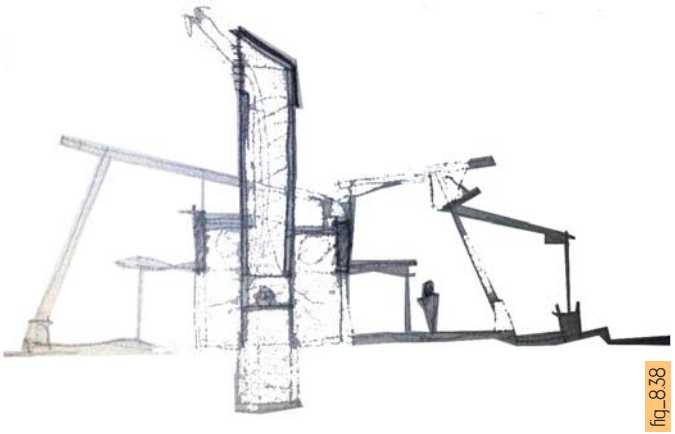


fig_8.38

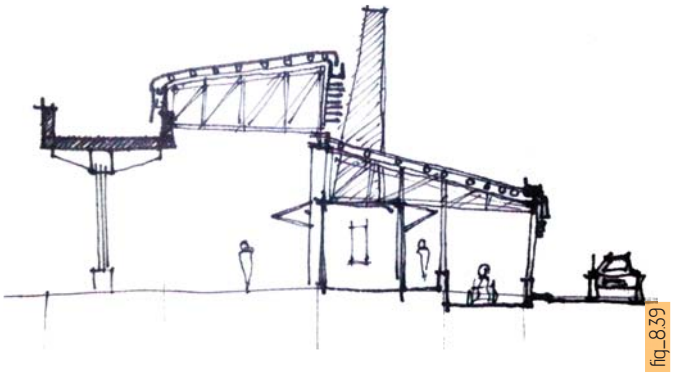
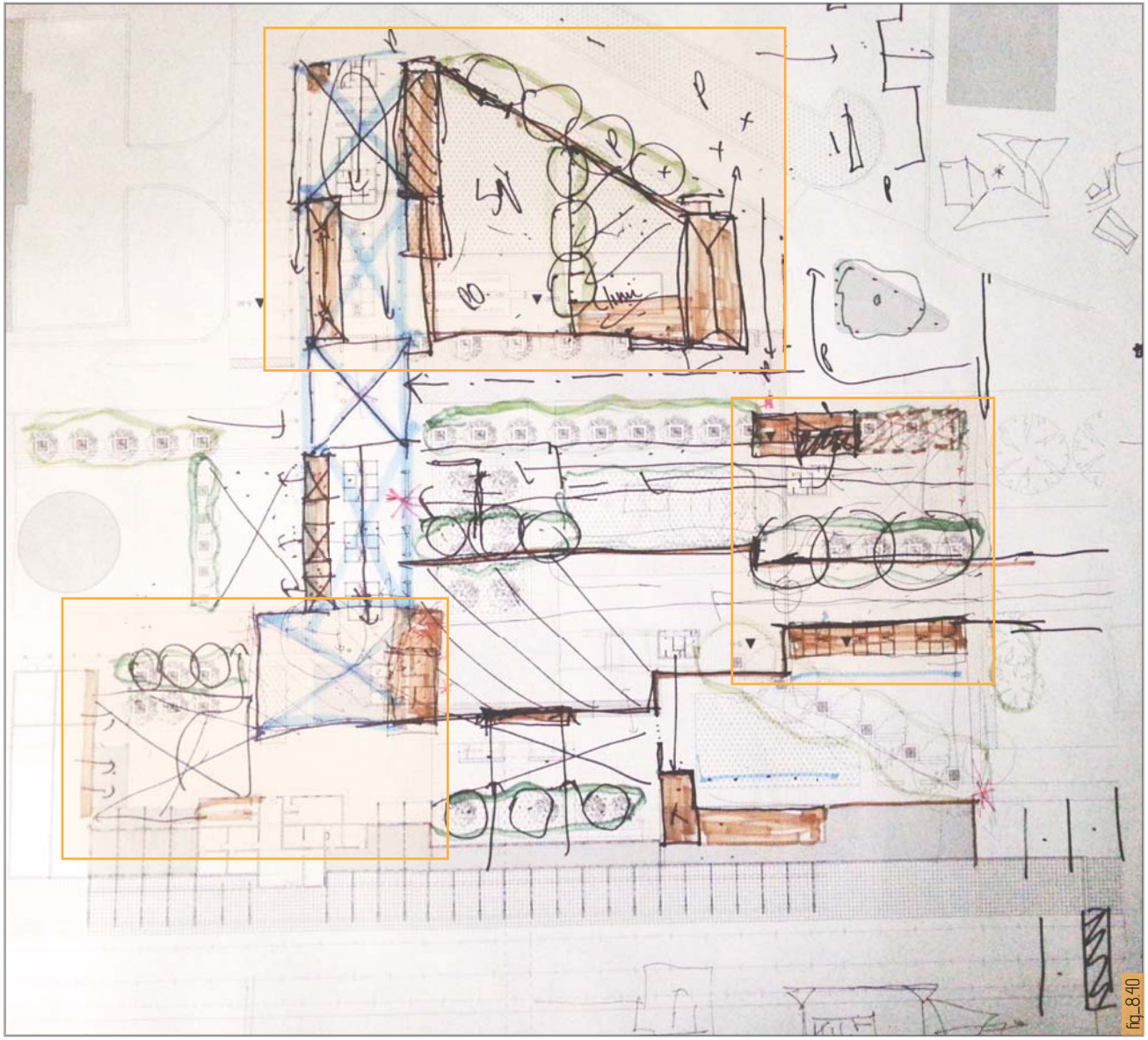


fig_8.39




The railway station's programmatic requirements were fragmented and spread around the site. Zones were created where similar functions were grouped together, for example, the ticketing and administration area in front of the old station. These zones help with the legibility of the precinct's functioning.

A majority of the civic functions that were grouped together in the second solution at the urban lobby space were kept together in the same area. These buildings were defined with public open areas, binding them together with sufficient circulation and waiting space for each one. This is to minimise the distance needed to travel for elderly patron collecting pensions, as well as to establish a point of cash transfer close to the road and trading activity.

Some of the civic programmes like the satellite police station and public laundry were designed in spaces surrounding the station itself. The police station is located on the station concourse across from the ticketing office as this is considered the area which would attract the most pedestrian traffic. The laundry is located on route to the taxi rank to ensure enough space for its programmatic requirements and ease of use for passing pedestrians.

**Fig_8.40** Conceptual sketch plan with different programmatic zones highlighted in orange **[Author et al, 2012]**

**Fig_8.41** Conceptual sketch of the main route leading to the station from the east **[Author, 2012]**

fig_84

Fig. 9.01

# Chapter 9
# Technical Resolution



**Fig_9.01** View of railway tracks with focus on the island in the middle that separate the passenger tracks from the loading tracks **[Author, 2012]**

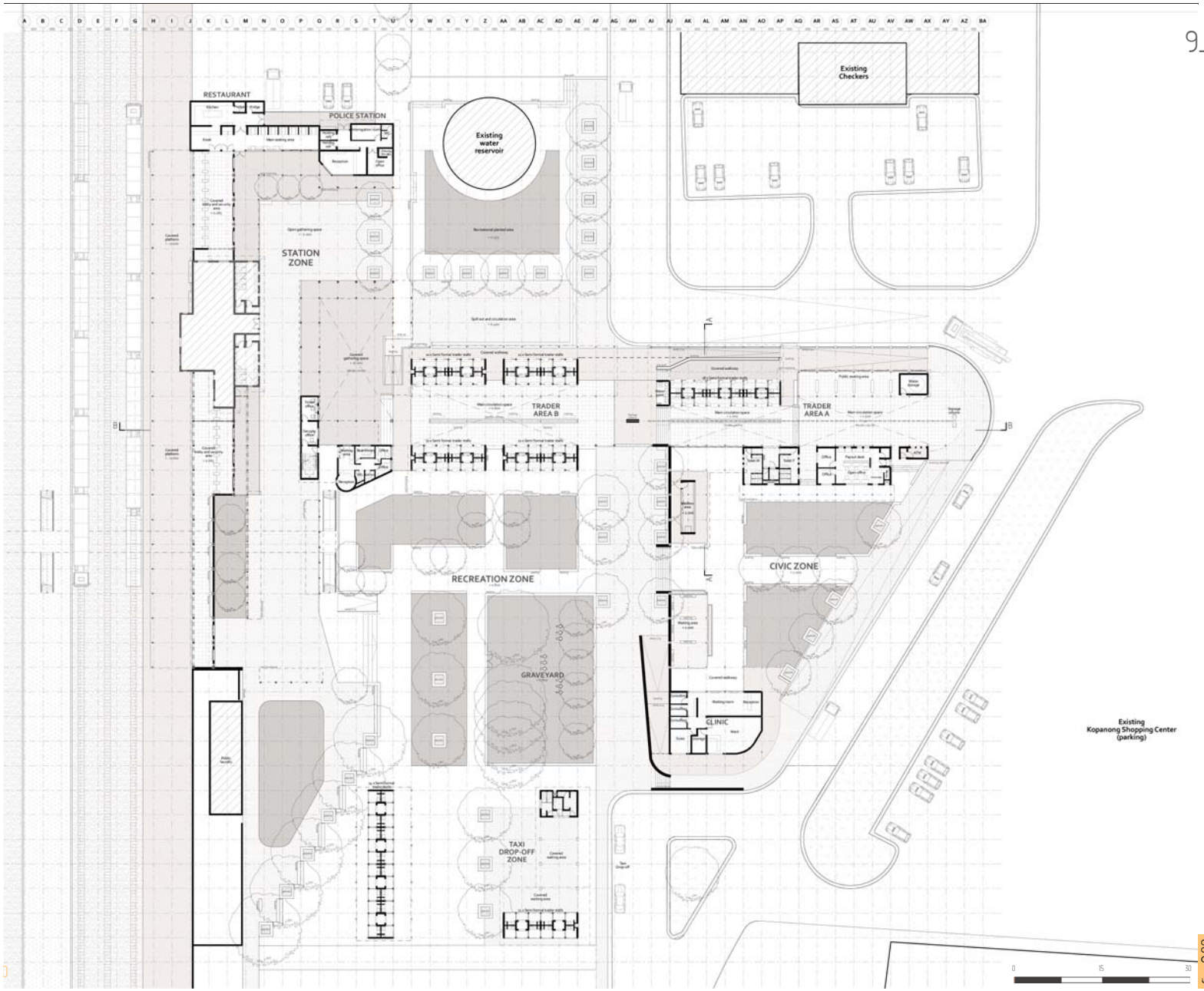



fig_9.02

Fig_9.02 Site plan [**Author, 2012**]

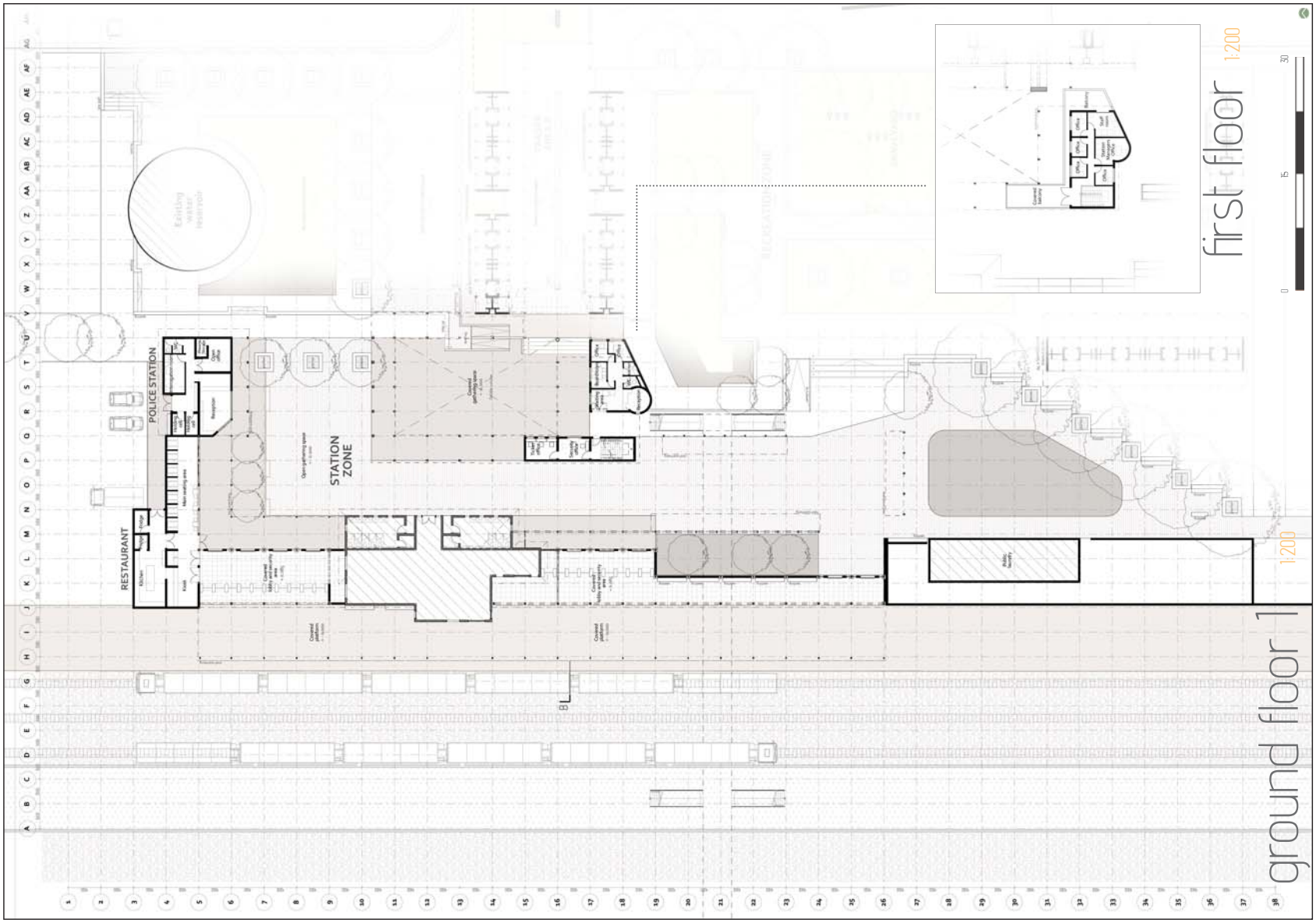



**Fig_9.03** Ground floor plan 1 [**Author, 2012**]

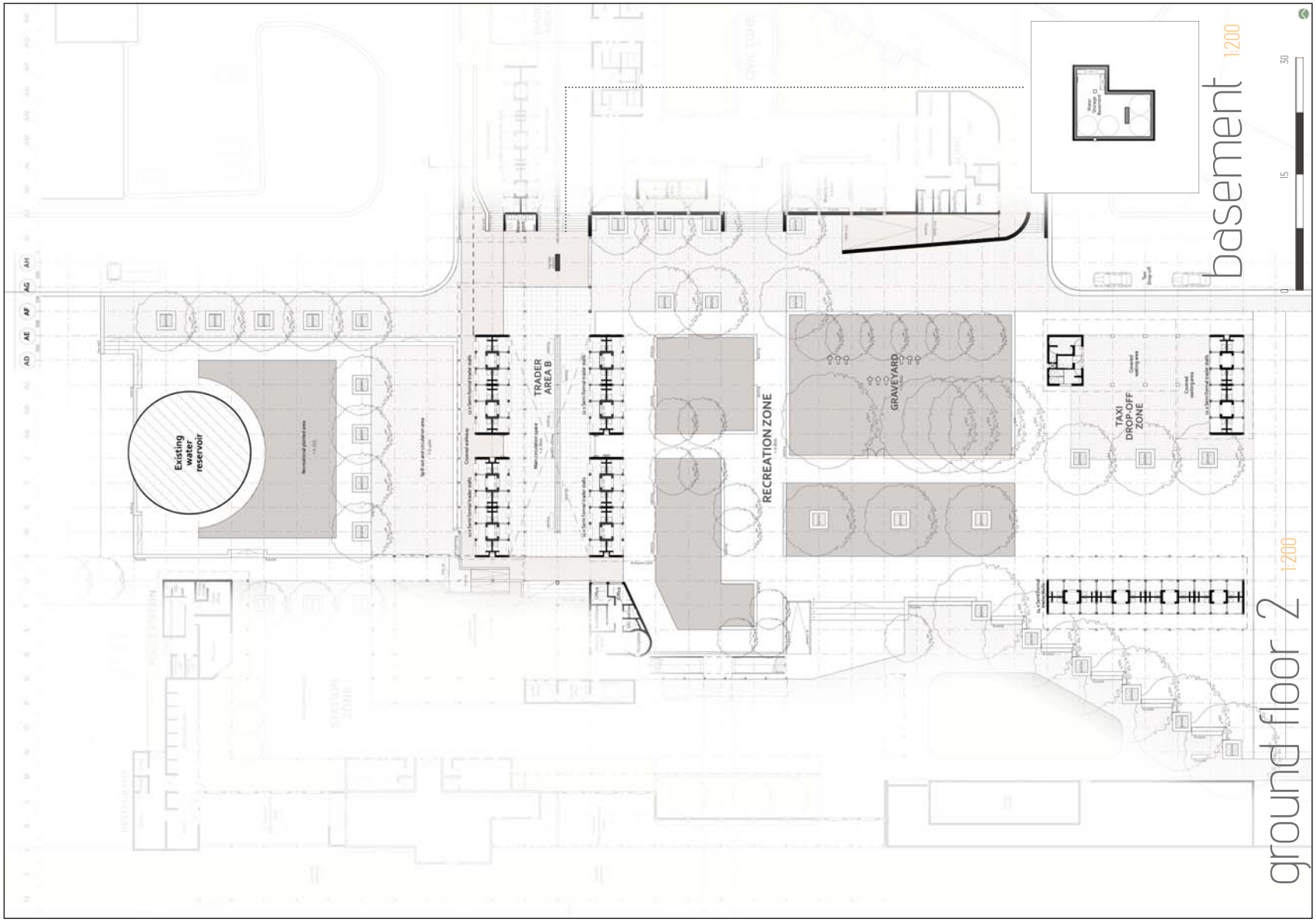



**Fig_9.04** Ground floor plan 2 **[Author, 2012]**

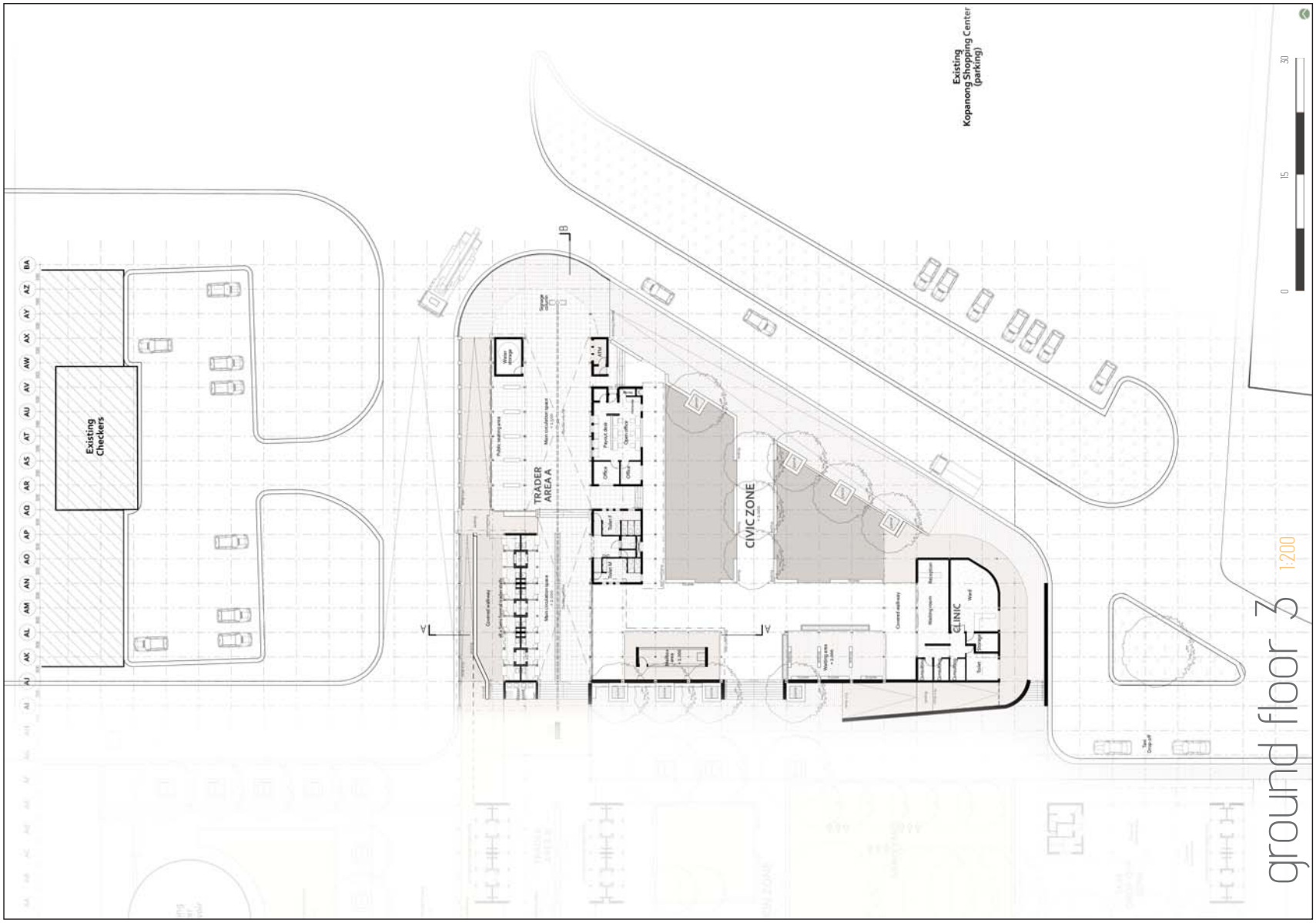
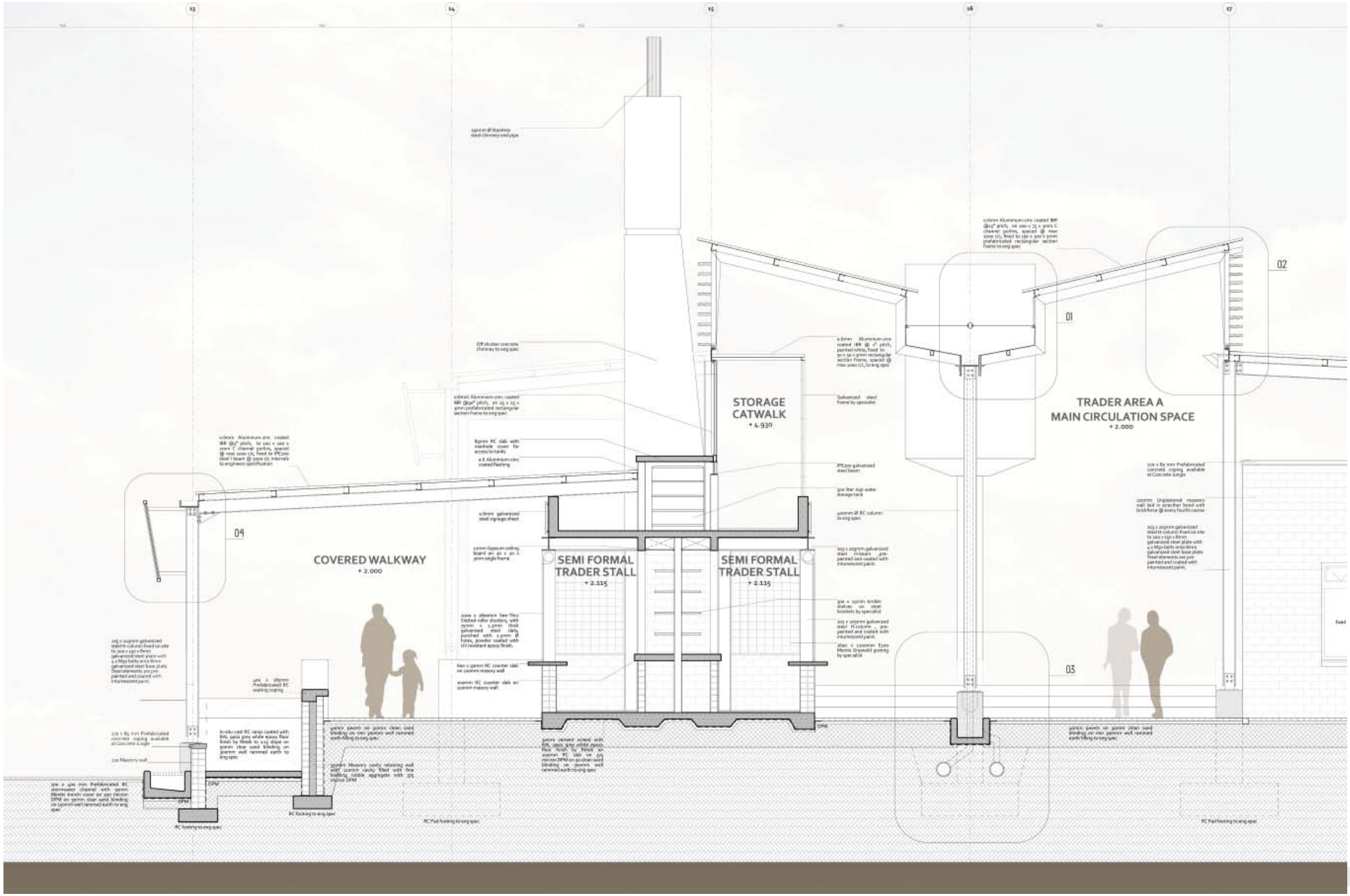



Fig_9.05 Ground floor plan 3 [**Author, 2012**]



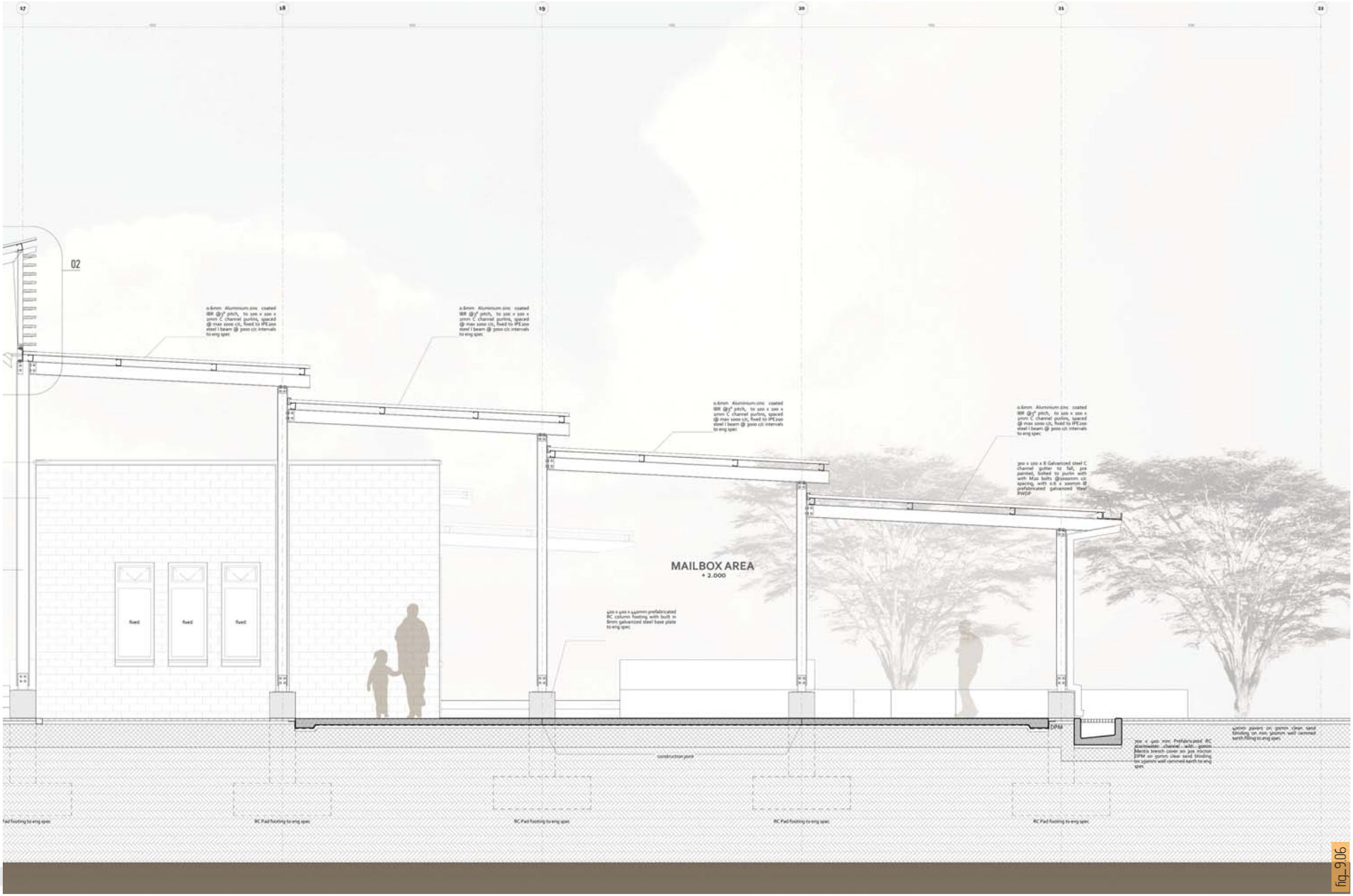



fig_3.06

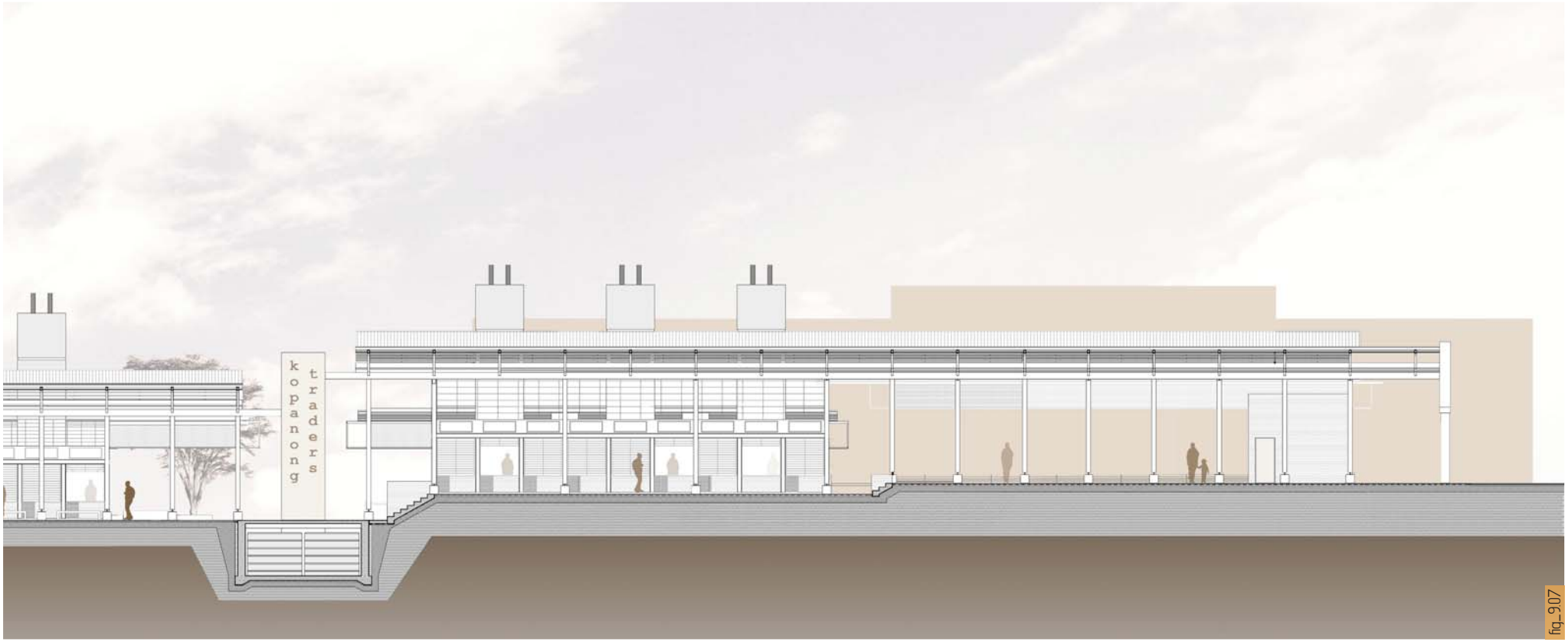



**Fig_9.06** Section A-A **[Author, 2012]**

**Fig_9.07** Section B-B **[Author, 2012]**

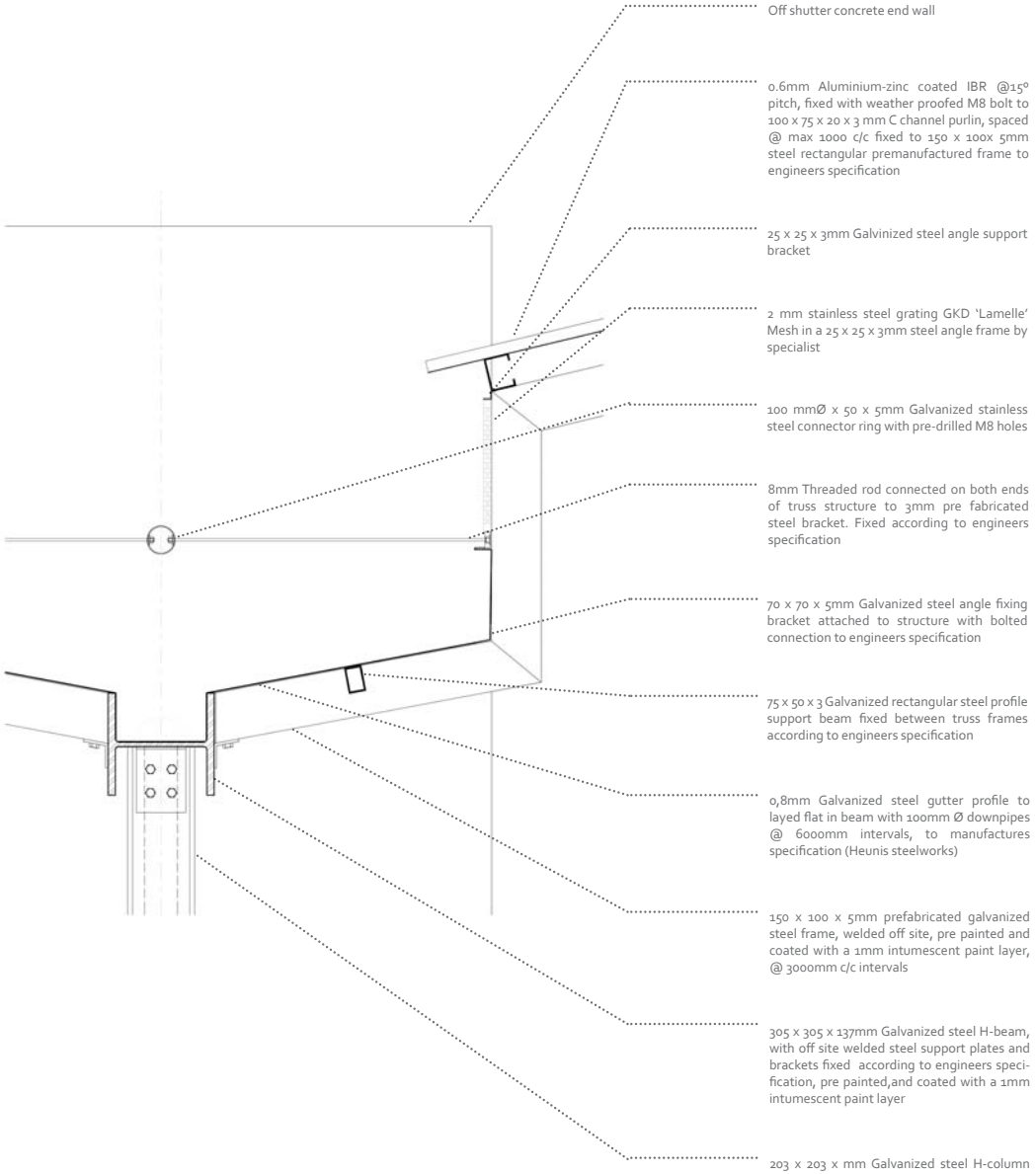



fig_9.08

**Fig_9.08** Central gutter detail [**Author, 2012**]

**Fig_9.09** Central gutter detail rendering [**Author, 2012**]

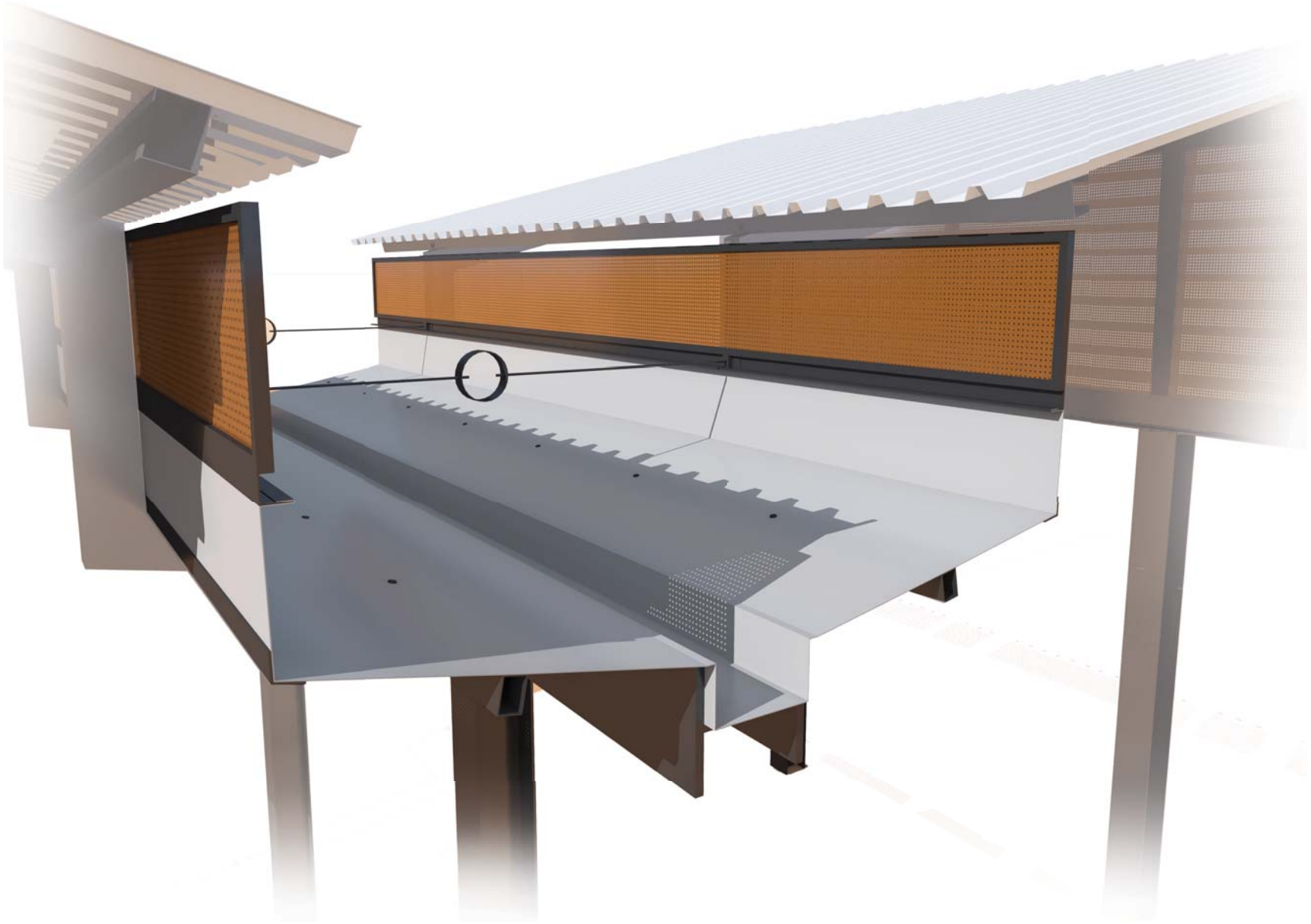


fig_909

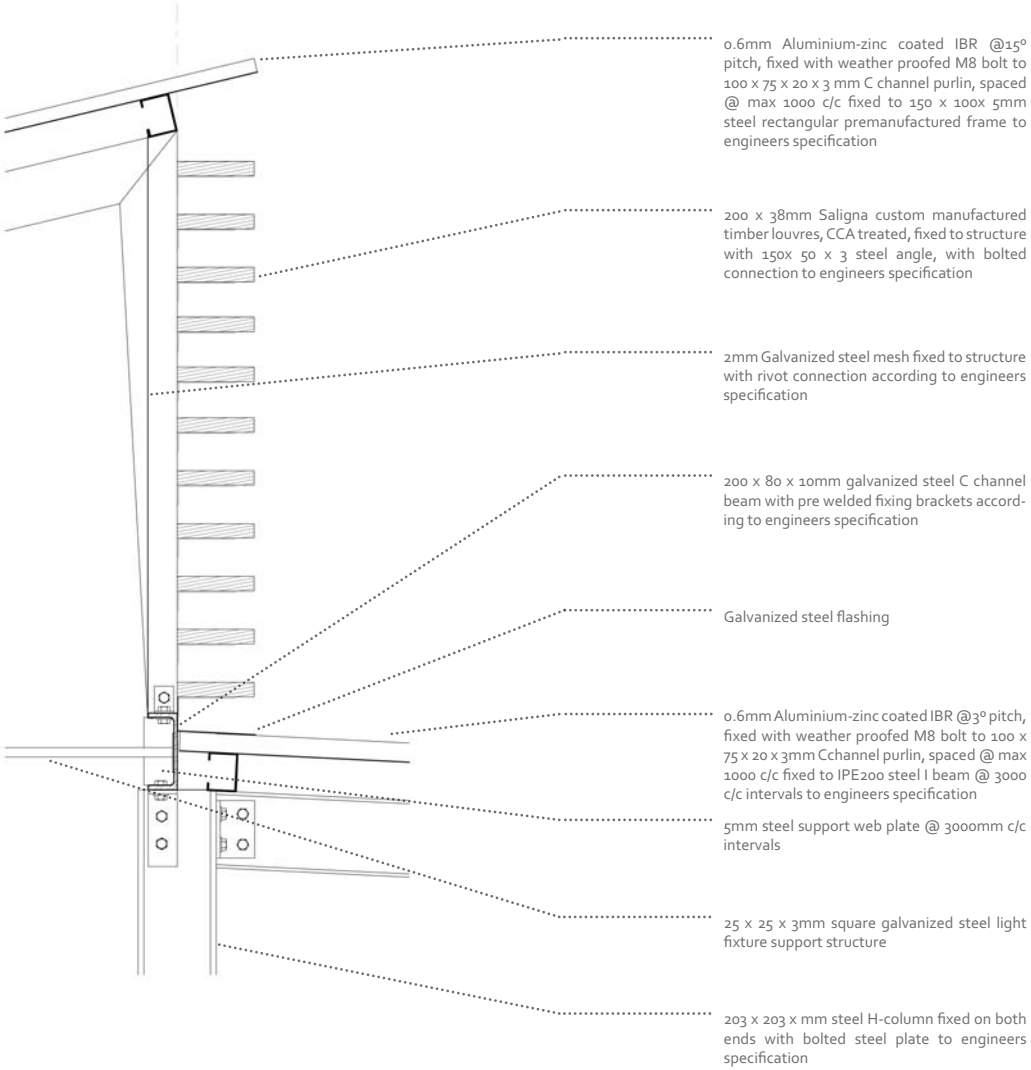



**Fig_9.10** Timber louvre and roof eave detail [**Author, 2012**]

**Fig_9.11** Timber louvre and roof eave detail rendering [**Author, 2012**]

fig_9.10

fig_9.11

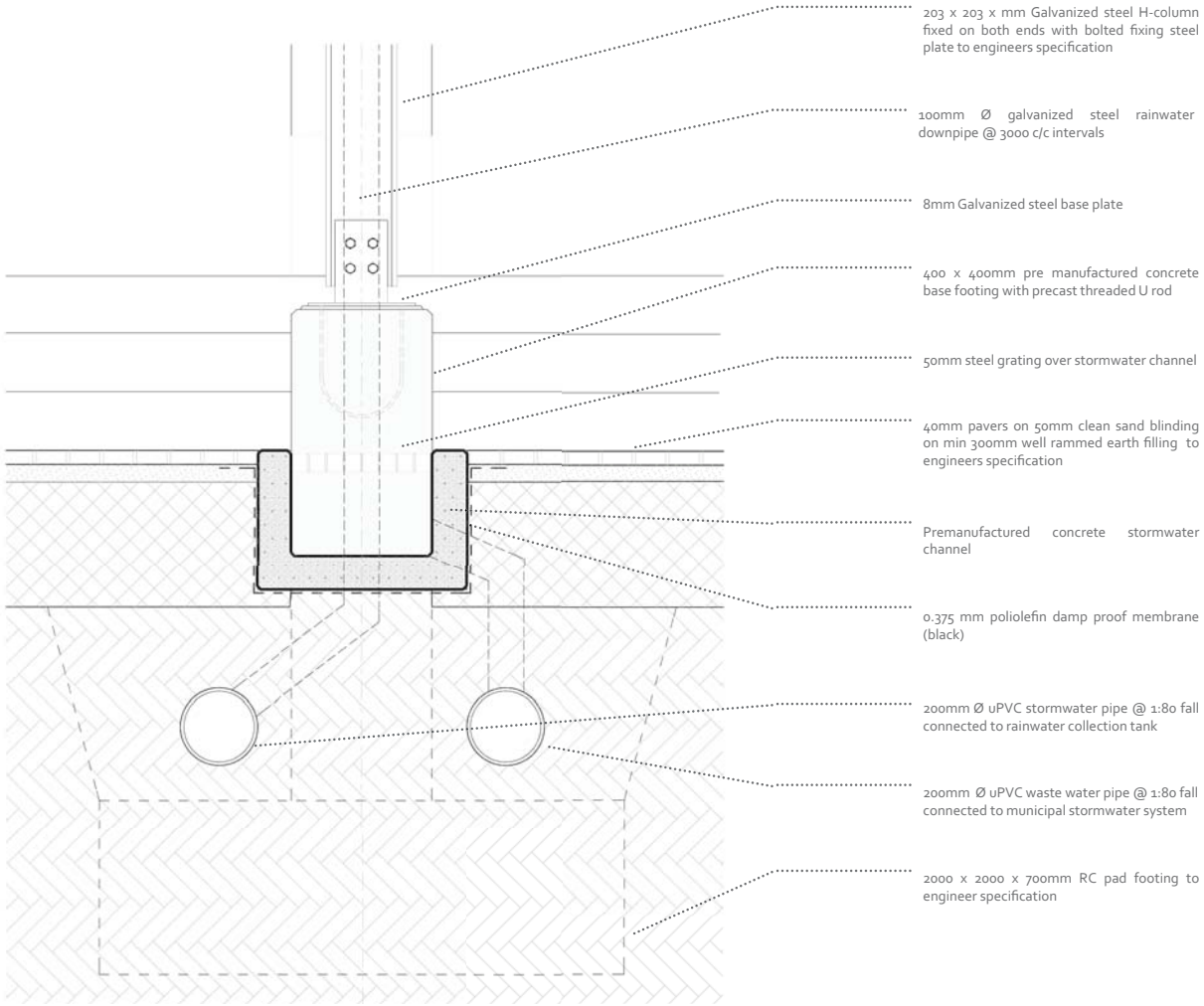



**Fig_9.12** Storm water detail and column footing detail
**[Author, 2012]**

**Fig_9.13** Storm water detail and column footing detail rendering
**[Author, 2012]**

fig_9.12

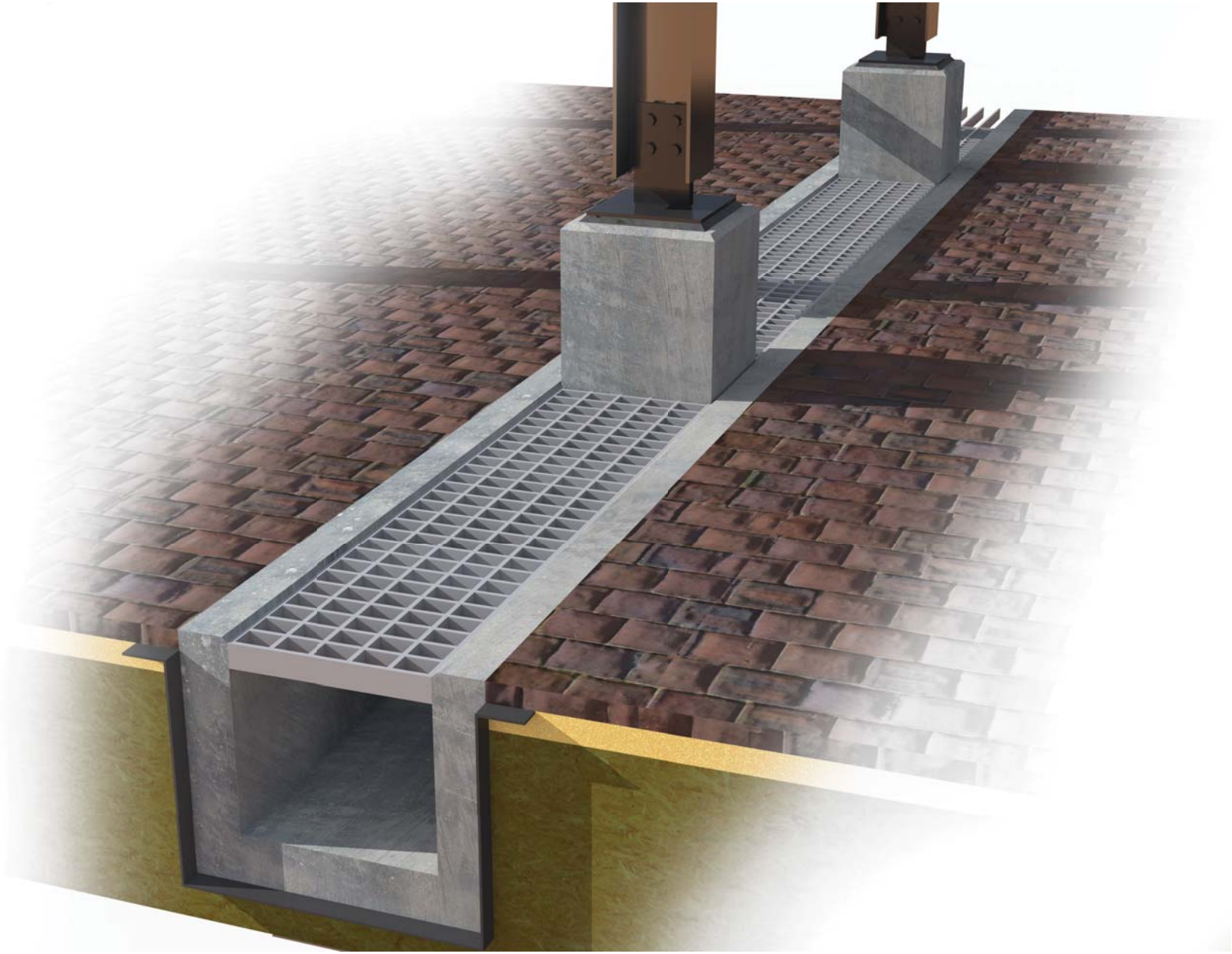


fig_9.13

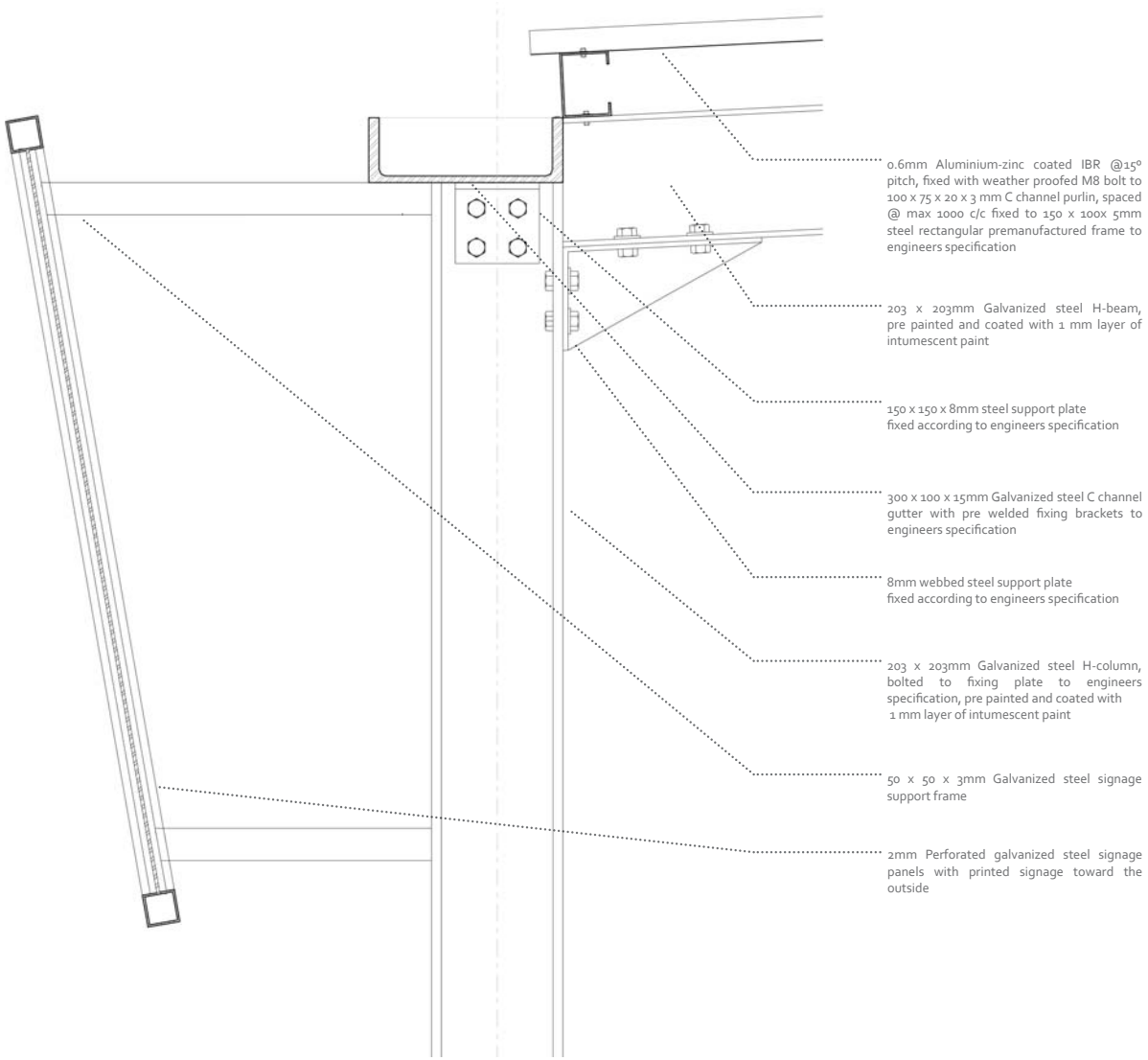



**Fig_9.14** Street side roof edge detail **[Author, 2012]**

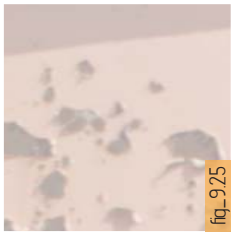
**Fig_9.15** Street side roof edge detail rendering **[Author, 2012]**

fig_9.14

fig_9.15

## 9_02 Materiality

Materials are chosen to contrast one another, in texture, aesthetic, aging and temperature. This contrast is reflected in the activities and diversity of people found in the Hammanskraal commercial precinct. Ranging from informal trading stalls and barefoot pedestrians to national retail chains and upmarket vehicles, Hammanskraal reflects a truly diverse and vibrant community. It is these dualities and contrasts that is reflected in the materiality choices in the building.



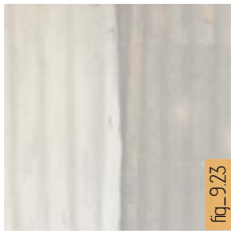



**Fig_9.16 - 29** Light weight steel and corrugated metal sheeting material palette found in and around Hammanskraal **[Author, 2012]**

**Fig_9.30 - 31** Light weight material and fabric used as shelter material in and around Hammanskraal **[Author, 2012]**

**Fig_9.32 - 35** Light weight timber materials in and around Hammanskraal **[Author, 2012]**

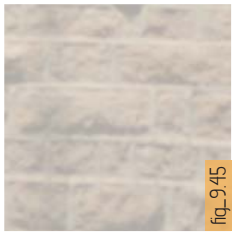



**Fig_9.36 - 44** Clay masonry bricks as main construction material in Hammanskraal [**Author, 2012**]

**Fig_9.45** Sandstone blocks found in historic railway house next to the Hammanskraal railway station [**Author, 2012**]

**Fig_9.46 - 47**Concrete blocks as construction material in Hammanskraal [**Author, 2012**]

**Fig_9.48 - 49** Plaster as wall finish [**Author, 2012**]

**Fig_9.50** Stone aggregate as floor cover next to railway line [**Author, 2012**]

**Fig_9.51 - 54** Natural materials and colours found in Hammanskraal [**Author, 2012**]

| Material | | Description of use | Where it is used in the building |
|---|---|---|---|
| IBR |  fig_955 | IBR sheeting is used as a roofing material for its availability in the area as well as ease of construction. Roofing materials in the area tend to be of an industrial nature, which correlates with the shed structure typology of the buildings. This material was chosen for aesthetic and functional reasons. The use of this material ties in with the deconstruction aspect of the structure, where all the connections are mechanical, through the use of bolting, to ease future alterations and disassembly. | 0.6mm Aluminium-zinc coated IBR @15° pitch, fixed with weather proofed M8 bolt to 100 x 100 x 2mm Z channel purlin, spaced @ max 1000 c/c fixed to IPE200 steel I beam @ 3000 c/c intervals to engineers specification |
| Galvanized structural steel |  fig_956 | The main structural system of the design is a frame constructed from H and I galvanized steel sections. These members are generally available and contribute to the simplicity and legibility of the structure, through repetition and honesty of construction. The steel is galvanized and pre painted for corrosion protection and a layer of intumescent paint is applied for fire protection. A duality in material choice is created between steel functioning best in tension and concrete in compression. This duality is also reflected in the relationship between formal and informal commercial activity in the area. | 203 x 203 x mm galvanized steel H-column fixed on both ends with a 200 x 150 x 8mm steel plate with 4 x M30 bolts, pre painted, and coated with a 1mm intumescent paint layer |
| GKD 'Lamelle' Mesh |  fig_957 | The GKD 'Lamelle' Mesh was chosen as a dual functioning component. It is used as a shading device for the clearstorey opening above the buildings' central gutter, as well as, to keep unwanted birds and leaves from entering the building from above. | 2 mm stainless steel grating GKD 'Lamelle' Mesh in a 25 x 25 x 3mm steel angle frame by specialist |
| Timber louvres |  fig_958 | Saligna timber louvres are installed along the length of buildings' facades between the roof edge and the start of the lower roofed spaces. The louvres are used for sun protection. With adequate roof overhangs and weather treatment, CCA, the louvres can withstand the harsh weather conditions and will only require sporadic maintenance. The aging timber with provide a constant changing facade in contrast to the stark and static elements populating the area underneath the steel roof. | 114 x 38mm Saligna custom manufactured timber louvres, treated with CCA, fixed to structure with 40 x 25 x 2 steel angle and M8 bolts |

| Material | Description of use | Where it is used in the building |
|---|---|---|
| Masonry brick  fig_959 | Masonry bricks are available within 500 meters of the site which makes it a suitable infill material for this project. Masonry will be used predominantly to construct the massing underneath and next to the steel frame. This massing consists of the pension payout point, ATM, public toilets, administration and ticketing offices. The trading stalls will be constructed from infill masonry within the preconstructed steel frames. In most cases these walls will be exposed brick with recessed joints, to contrast the flush finishes of steel and concrete. | 220 mm thick masonry wall, with brick coarse every 5 brick layers |
| Concrete pavers  fig_960 | Concrete pavers are used for outdoor walkways as well as for flooring inside the building. The exposed sides of the building will allow some rainfall to penetrate the building interior in certain locations. Concrete pavers are used to drain excess water more effectively during these weather conditions. Because of the nature of the building programme, an informal market, floors will be littered with waste produce. This will require regular cleaning of the floors. Water runoff which does not drain to the central waste water system will, therefore, drain between the openings in the paving. | Concrete brick pavers, on 50mm clean sand blinding, on 300mm well rammed earth filling to eng spec |
| Concrete elements  fig_961 | Fair faced concrete construction and finish is used to highlight certain elements and functions. The chimneys in this design, which become iconic elements, are constructed from concrete to give the building and its activities a sense of permanence and stature. All the public seating in the project is made from precast concrete members which allow for more robust elements to withstand the vast amount of commuter and trading activities. | Off shutter concrete walls or plastered masonry walls.<br><br>Pre fabricated concrete furniture |

**Fig_9.55** IBR sheeting found around the site **[Author, 2012]**

**Fig_9.56** Steel columns next to the railway line **[Author, 2012]**

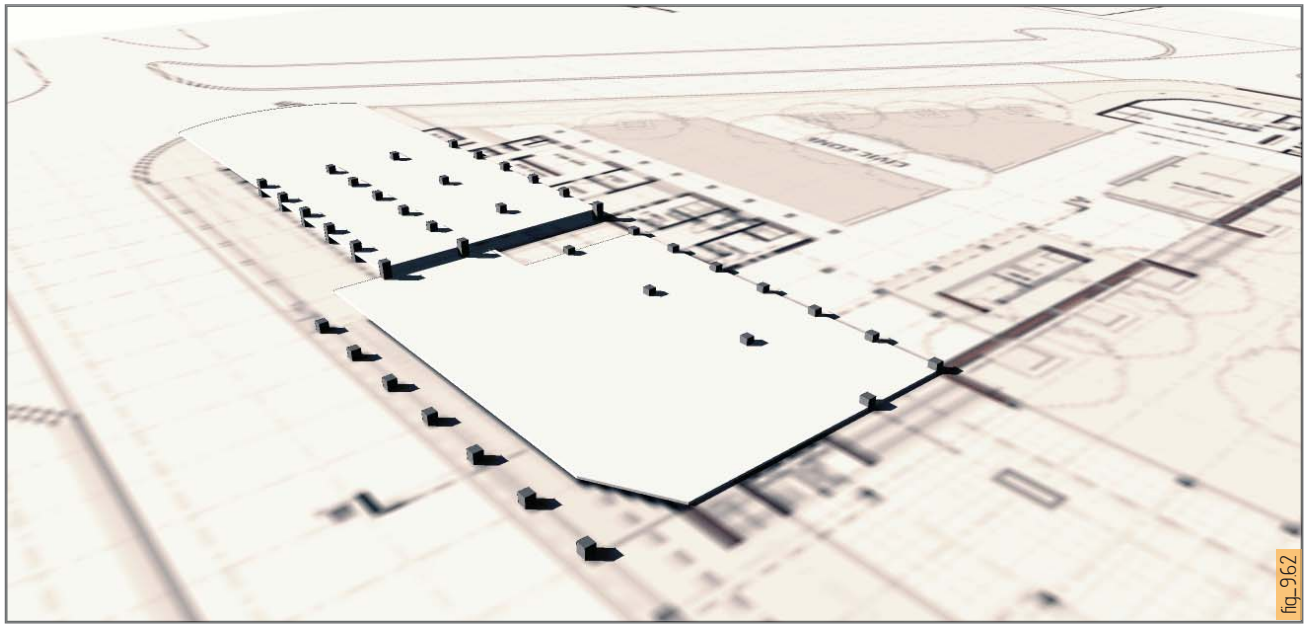
**Fig_9.57** GKD 'Lamelle' Mesh **[Author, 2012]**

**Fig_9.58** Timber door **[Author, 2012]**

**Fig_9.59** Masonry **[Author, 2012]**

**Fig_9.60** Concrete pavers **[Author, 2012]**

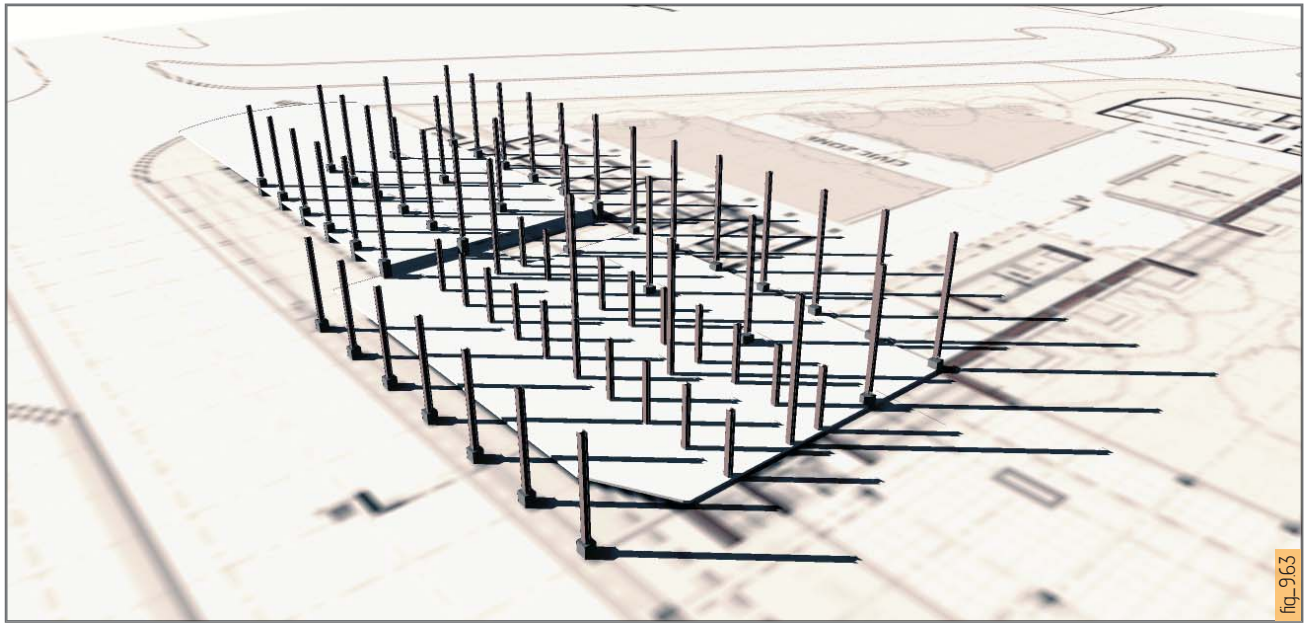
**Fig_9.61** Plastered wall **[Author, 2012]**




## 9_03 Structural system phasing

Phase 1

Reinforced concrete pad foundations for the steel columns are cast with the prefabricated vertical up stand placed into position to form a single component. The prefabricated up stand has a built in baseplate to which the steel column footing will attach.




Phase 2

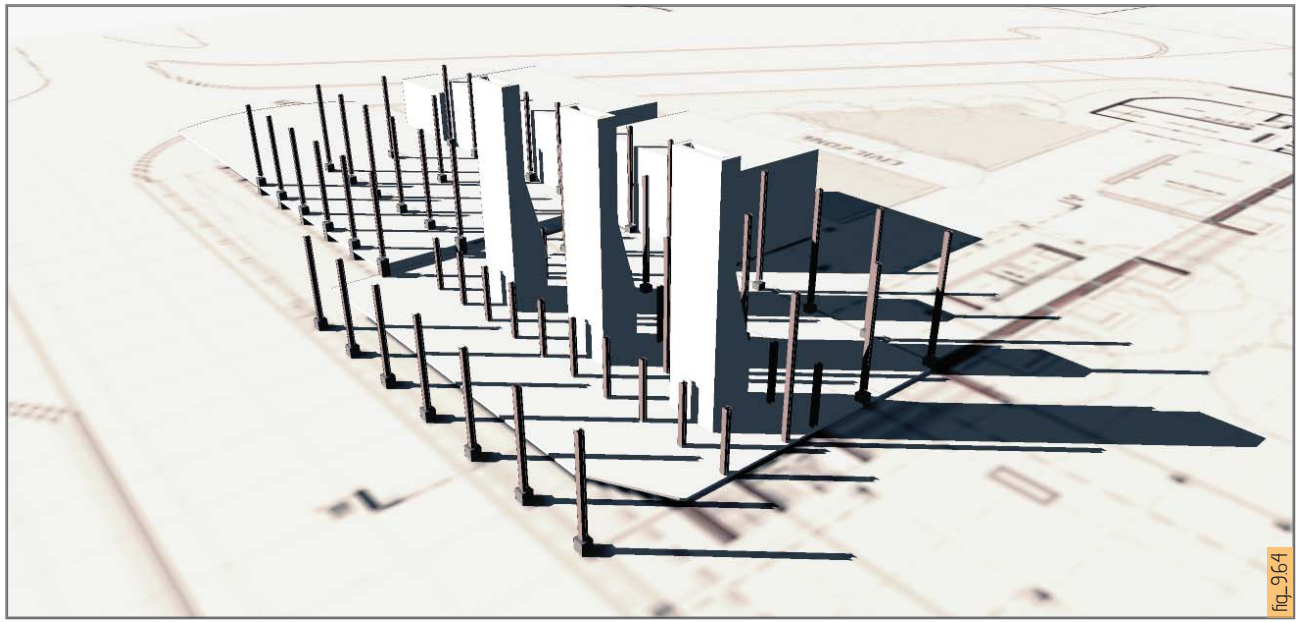
Steel H-section columns of various lengths will be bolted to the baseplates.

**Fig_9.62** Phase 1 of construction process **[Author, 2012]**

**Fig_9.63** Phase 2 of construction process **[Author, 2012]**

Phase 3

Brick infill structures will be erected to which the beams will attach in a later construction phase.




Phase 4

Steel H- and I-section beams are bolted to the previous mentioned steel columns and where needed attached to the brick mass structures.

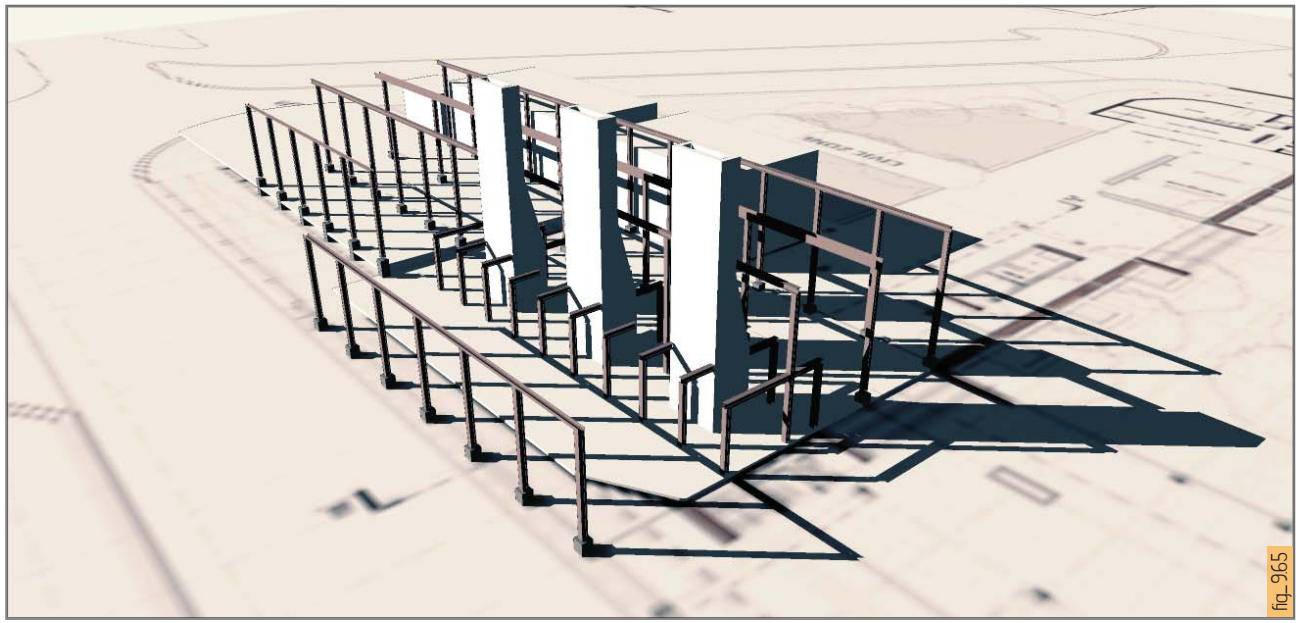
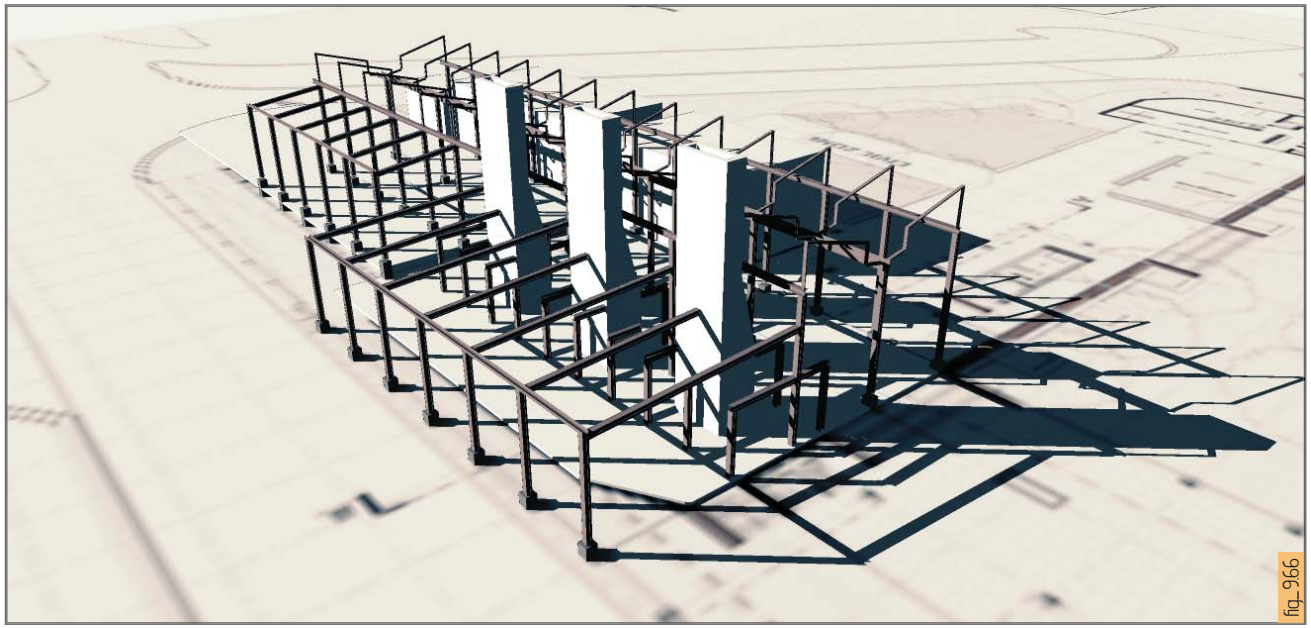


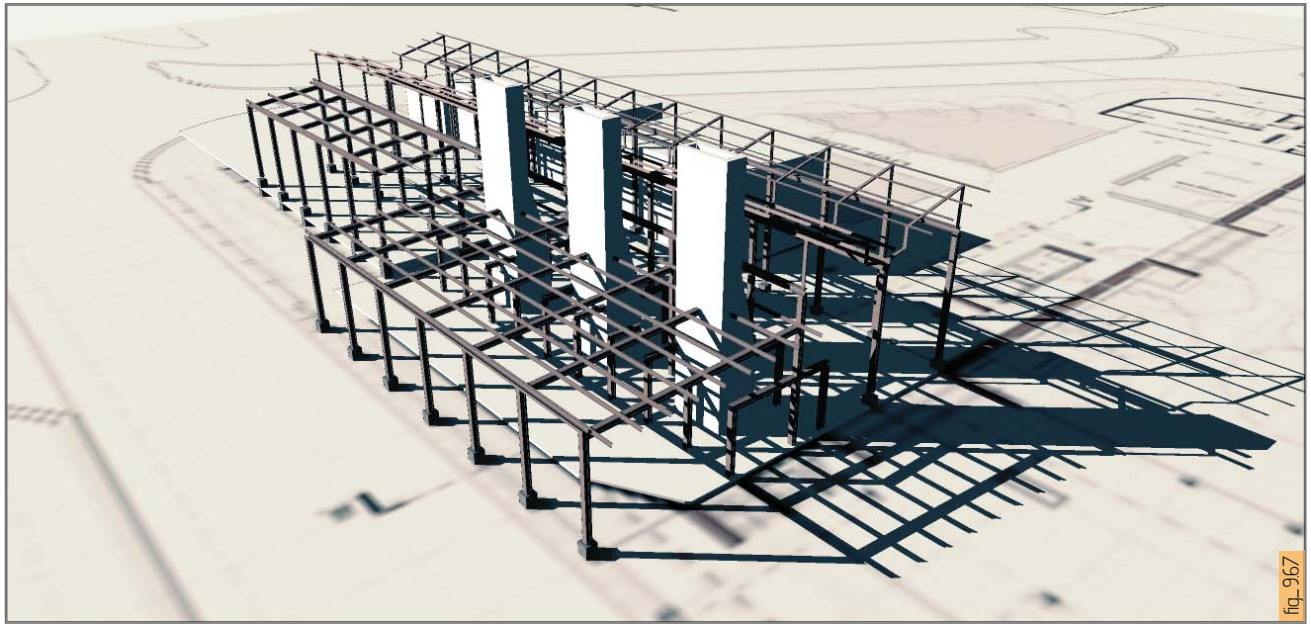

**Fig_9.64** Phase 3 of construction process [**Author, 2012**]

**Fig_9.65** Phase 3 of construction process [**Author, 2012**]




Phase 5

Steel truss beams and prefabricated steel frames, located at the main connecting roof, are bolted to the main structural steel beams.




Phase 6

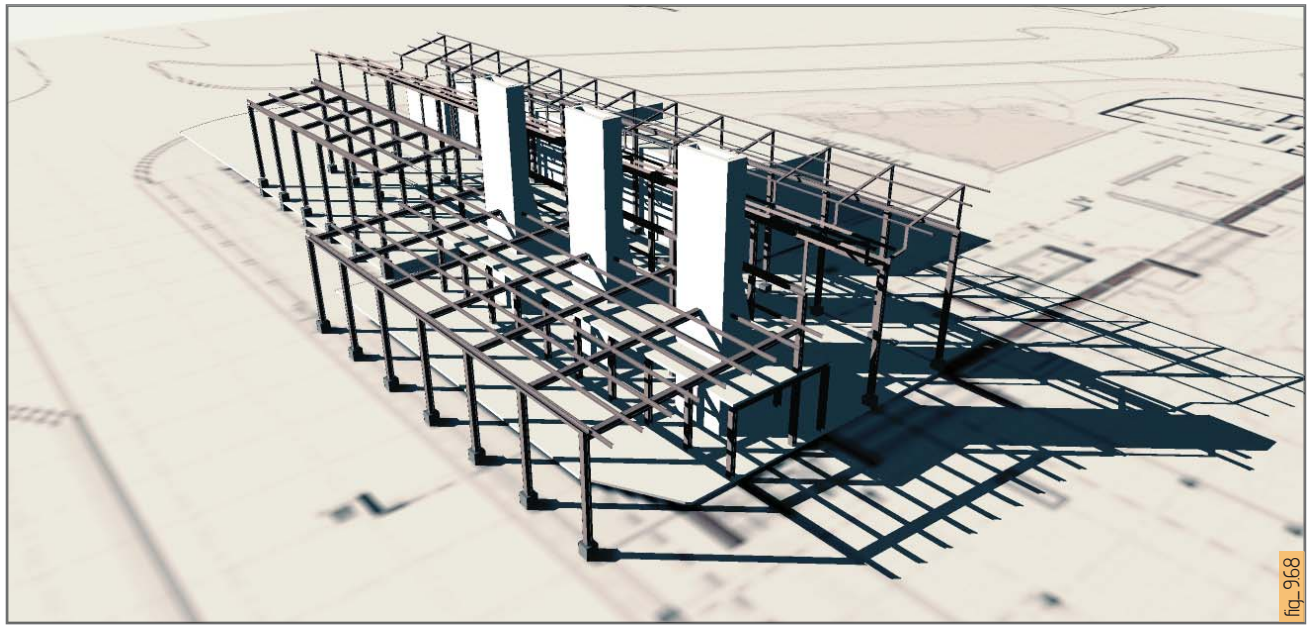
Z-profile steel purlins are bolted to the frames and truss beams and steel gutter channels on the outside perimeter roofs are welded in place on top of the structural beams

**Fig_9.66** Phase 5 of construction process **[Author, 2012]**

**Fig_9.67** Phase 6 of construction process **[Author, 2012]**

Phase 7

First floor slabs above the stalls are cast in-situ




Phase8

Final structural finishes such as the corrugated IBR roof sheets and the galvanized steel gutter is fixed to the purlins and frames respectively and waterproofing flashing is installed at all exposed junctions

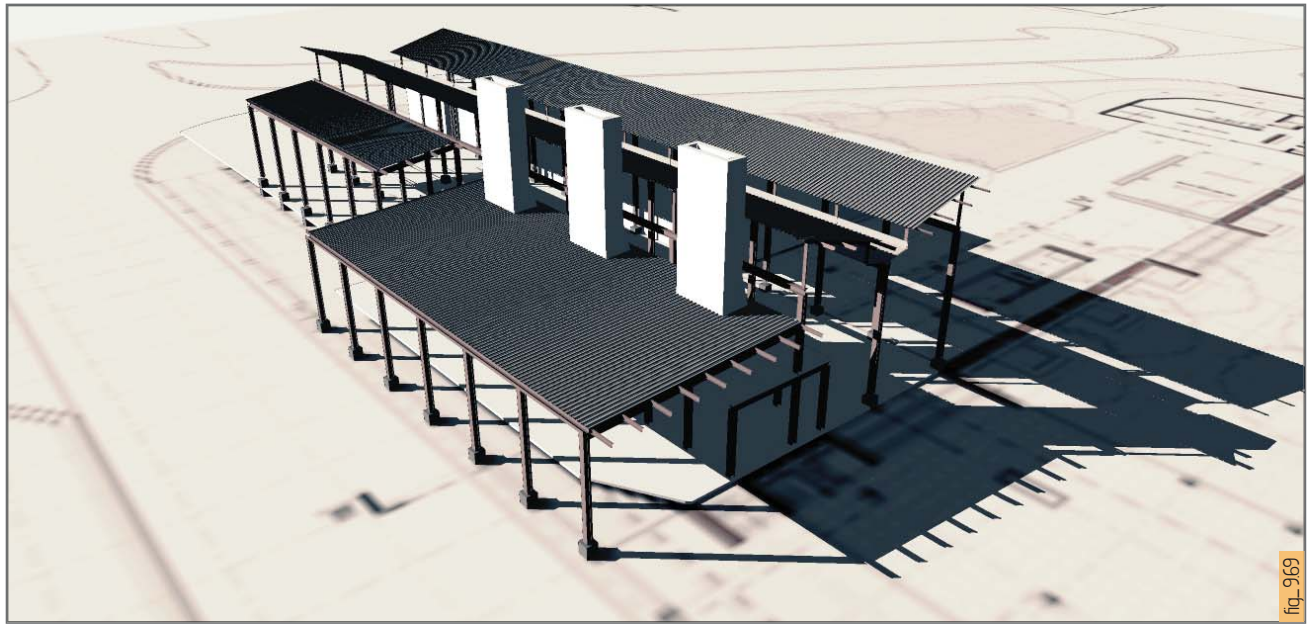



**Fig_9.68** Phase 7 of construction process [**Author, 2012**]

**Fig_9.69** Phase 8 of construction process [**Author, 2012**]

## 9_04 Rainwater collection, storage and distribution

Rainwater collection is utilized to relief the buildings reliance on municiple water services. The large amount of exposed roof area has the capacity to catch a substantial amount of water. This stored water will, after proper filtering and cleaning, be available for consuption by traders and other users of the space. Wash basins in the stalls allow for vegetables to be washed before they are sold. By providing clean water to the local community, hygiene will be promoted as well as clean water for household cooking and general use.

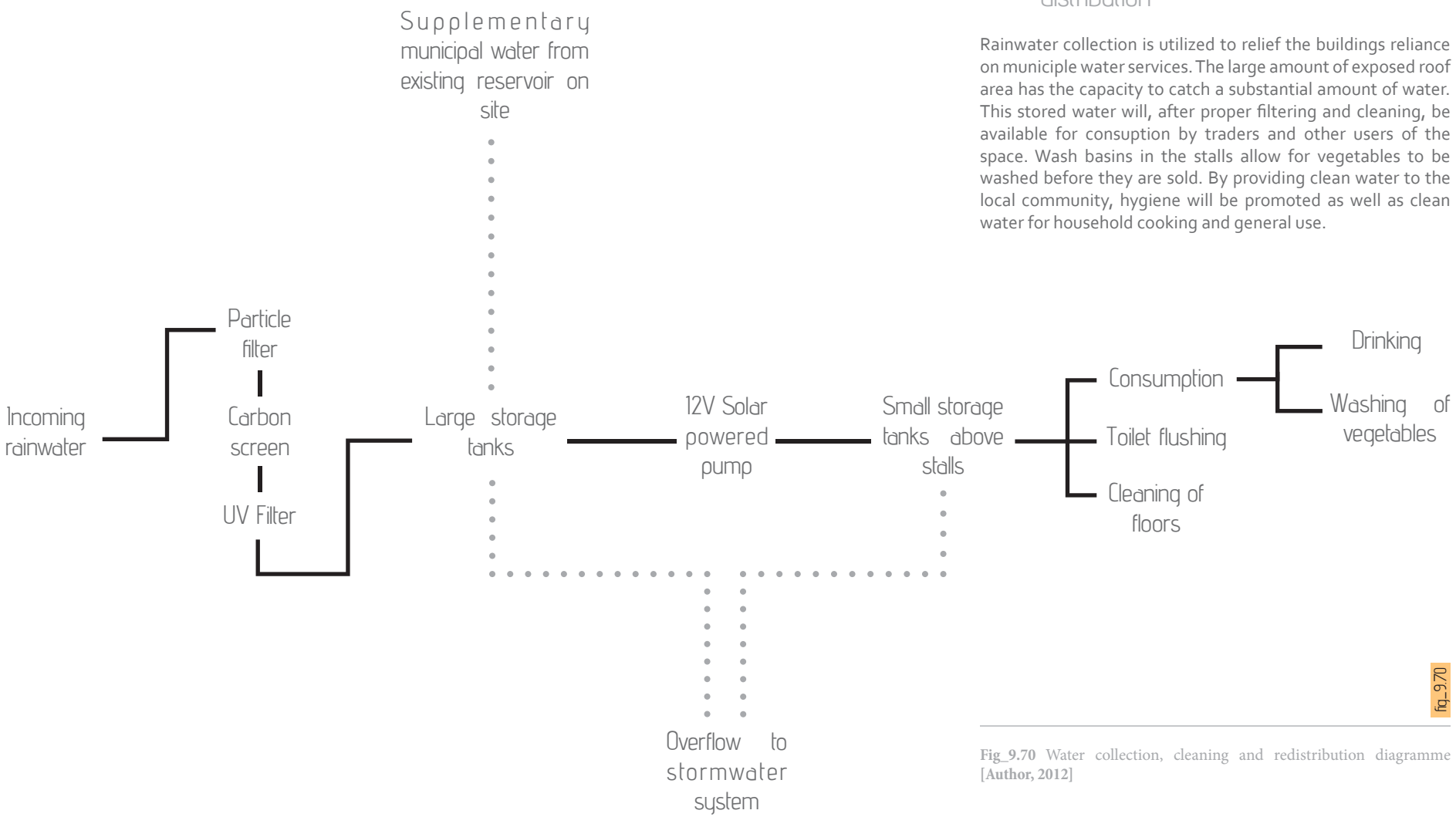



fig_9.70

**Fig_9.70** Water collection, cleaning and redistribution diagramme **[Author, 2012]**

Z one A: 710 m2 x 0.6
= 426 m2 Effective catchment potential ...[37%]

Z one B: 1225 m2 x 0.6
= 735 m2 Effective catchment potential ...[63%]

Total catchment: 1935 m2 x 0.6
= 1161 m2 Effective catchment ...[100%]

Total permanent occupants
[for ease of calculation the stall occupants were calculated and multiplied by a factor of 1.5]

Number of stalls: 66
Number of possible traders: 66 x 1.5 = 99
Factored number: 99 x 1.5 = 148.5

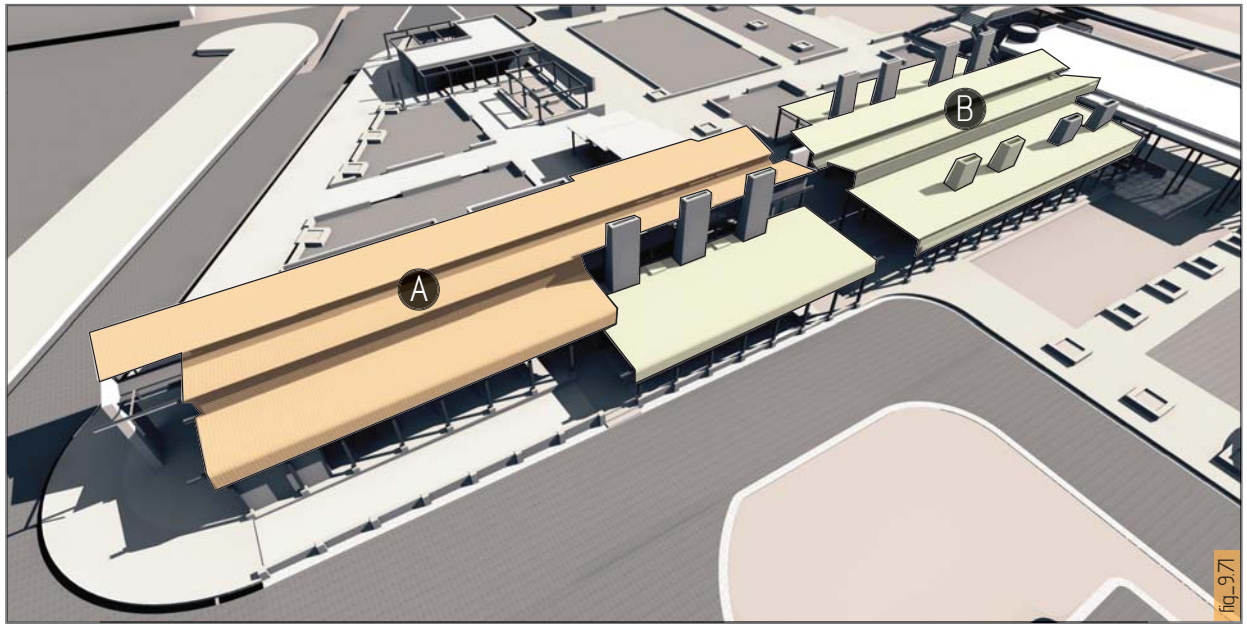
Total water usage
[150 people and 20 liters per person were used for calcultations]

Water use per day: 150 traders x 20 liters
= 3000 liters per day

Water use per month: 3000 liters x 30 days
= 90000 liter = 90 m3

Winter months: 90 m3

Summer months: 90 m3 x 1.5
= 135 m3



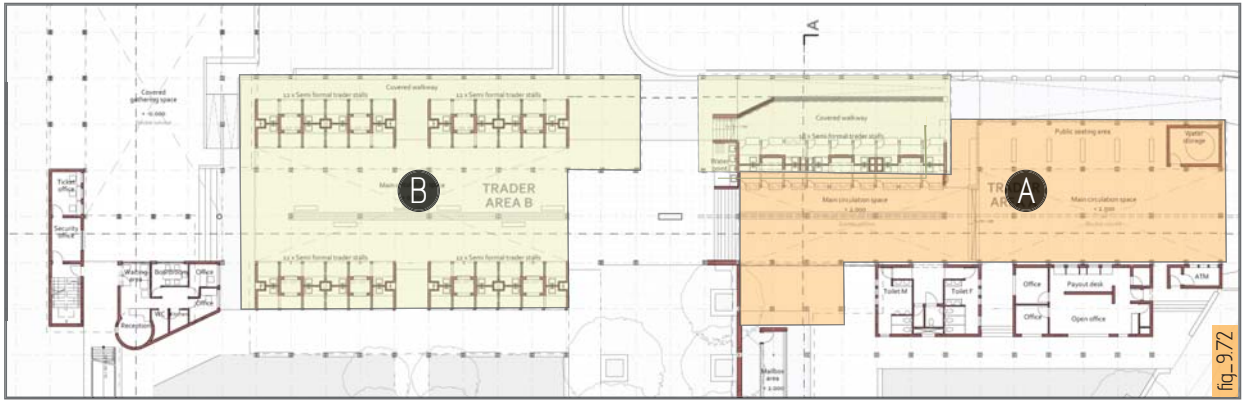




**Fig_9.71** Image illustrating water catchment areas **[Author, 2012]**

**Fig_9.72** Plan showing boundaries of catchment areas **[Author, 2012]**

Maximum storage capacity catered for is 62 m3 during February

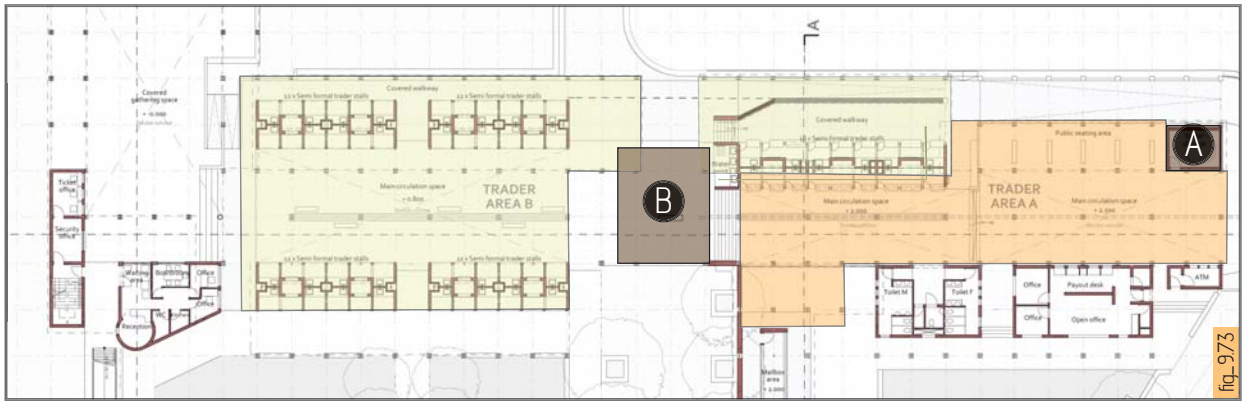
Z one A: 37 % x 62 m3
= 23 m3 ...[3 x 10000L tanks ]

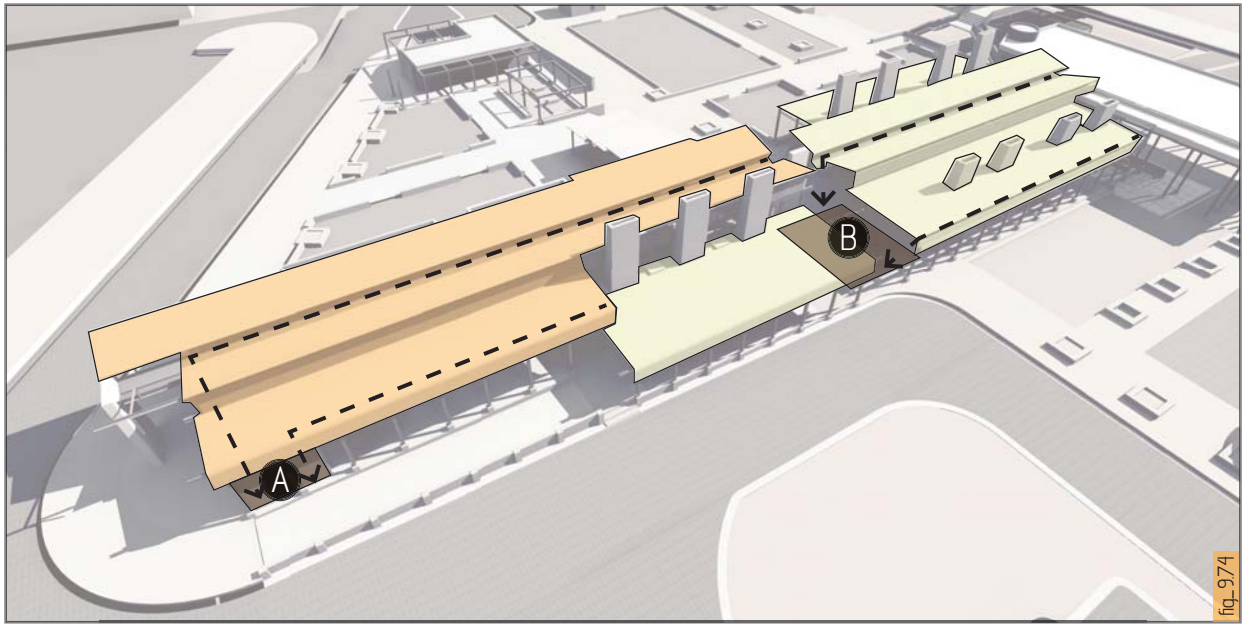
Z one B: 63 % x 62 m3
= 39 m3 ...[4 x 10000L tanks ]

## Storage tank sizes calculation

Water storage tanks are located in areas close to roof structures. The rainwater runoff pipes are located underneath the market floor, decreasing the amount of required piping and pumps needed to transport the water. The first step of the collection and filtering process has the water stored in larger tanks located as shown in fig xx. The water is then pumped to smaller storage tanks above the stalls. This systems allows precise monitoring of the water usage of each trader. Using this system allows the building management to optimise and adjust the system as the need arises.

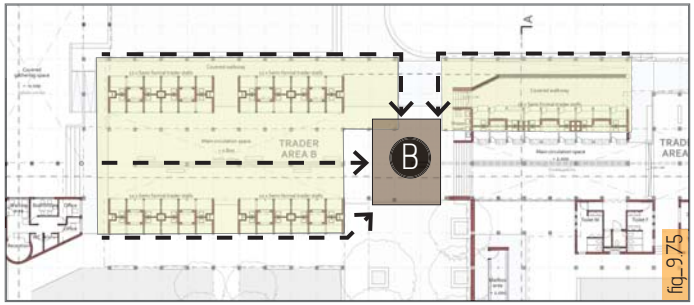
| PRECIPITATION | JAN | FEB | MARCH | APRIL | MAY | JUNE | JULY | AUG | SEPT | OCT | NOV | DEC | TOTALS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAYS | 103.8 | 113.1 | 82.8 | 44.1 | 17.8 | 8.6 | 3 | 2 | 20.5 | 71.4 | 108.1 | 107.7 | 682.9 |
| m | 0.1038 | 0.1131 | 0.0828 | 0.0441 | 0.0178 | 0.0086 | 0.003 | 0.002 | 0.0205 | 0.0714 | 0.1081 | 0.1077 | 0.6829 |
| AREA (m²) | 1935 total without efficiency coeffficient | | | | | | | | | | | | |
| LITRES (m³) | 200.853 | 218.8485 | 160.218 | 85.3335 | 34.443 | 16.641 | 5.805 | 3.87 | 39.6675 | 138.159 | 209.1735 | 208.3995 | 1321.4115 |
| HARVEST (m³)_90% eff co | 180.7677 | 196.96365 | 144.1962 | 76.80015 | 30.9987 | 14.9769 | 5.2245 | 3.483 | 35.70075 | 124.3431 | 188.25615 | 187.55955 | 1189.27035 |
| MONTHLY USAGE (m³) | 135 | 135 | 135 | 90 | 90 | 90 | 90 | 90 | 90 | 135 | 135 | 135 | |
| SURPLUS/DEFICIT | 45.7677 | 107.73135 | 116.92755 | 103.7277 | 44.7264 | -30.2967 | -115.0722 | -201.5892 | -255.88845 | -266.54535 | -213.2892 | -160.72965 | |
| | 45.7677 | 61.96365 | 9.1962 | -13.19985 | -59.0013 | -75.0231 | -84.7755 | -86.517 | -54.29925 | -10.6569 | 53.25615 | 52.55955 | |




## Water storage tanks and collection routes

Zone A houses 3 tanks stacked on top of each other on the eastern facade of the building. This is the highest point in the building which helps to facilitate water movement down through the building when pumped to different stall. Zone B houses 4 tanks underground in the centre of the building and constitutes nearly two thirds of the total water storage capacity of the building. Access to zone B tanks is through a hatch located east of the holding area at the communal wash basins.



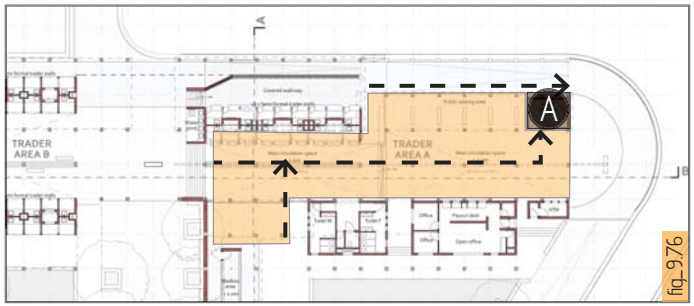
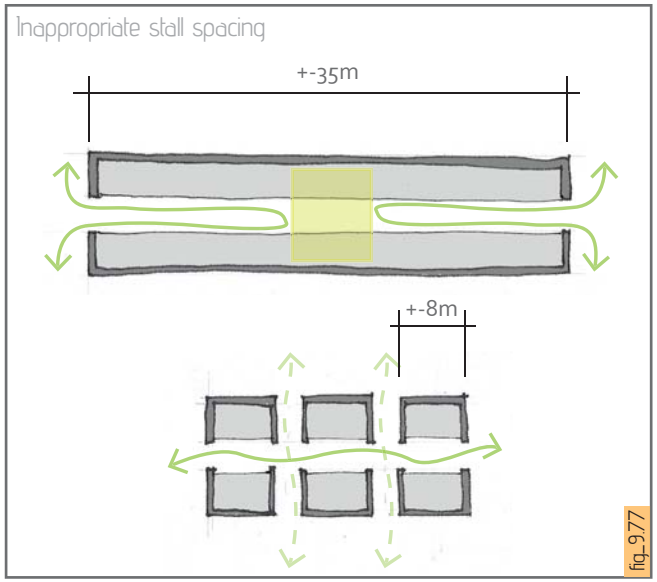



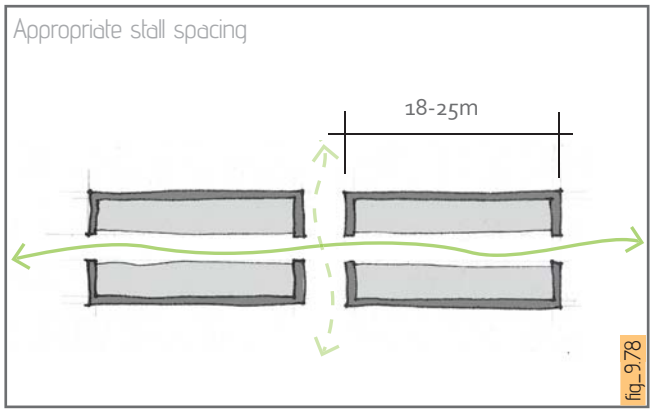

**Fig_9.73** Plan showing location of zone A and B water storage tanks **[Author, 2012]**

**Fig_9.74** Image of water storage location and collection routes **[Author, 2012]**

**Fig_9.75** Water collection routes and storage for zone B **[Author, 2012]**

**Fig_9.76** Water collection routes and storage for zone A **[Author, 2012]**




## 9_05 Circulation and access to stalls

The success of a market building rely mainly on two aspects, namely the orientation of the stalls and the position of the entrances. Stalls need to be orientated along major pedestrian routes in order to feed off the energy of the passing public.

Entrances should be placed to distribute pedestrians evenly among stalls, giving equal exposure and opportunity to each stall. The market building in this dissertation was designed to have two major entrances, one on each end, in order to attract possible buyers coming out of the train station and those walking along the major road parallel to the railway tracks. Additional smaller scale entrances and cross circulation routes have been provided along the spine of the building, which creates a building which is accessible from almost all directions.

Guidelines for stall sizes set out in Watson, V. and Behrens, R's book *Making Urban Places: Principles and Guidelines for Layout Planning* (1996:214-215), have been consulted and incorporated into the design. Fig_9.73, illustrates the appropriate sizing of stalls and their circulation routes. If the stalls are designed in a too long single block, buyers tend to avoid the central stalls leaving them marginalised. This problem has been avoid in the design by providing more regular breaks in the massing for circulation.

Enough space, nearly 10m, has been provide between northern and southern trading blocks for circulation and possible informal stalls. This allows informal traders to reappropriate the space and populate the structure to fit their needs in terms of optimal stall positioning and altered circulation patterns.

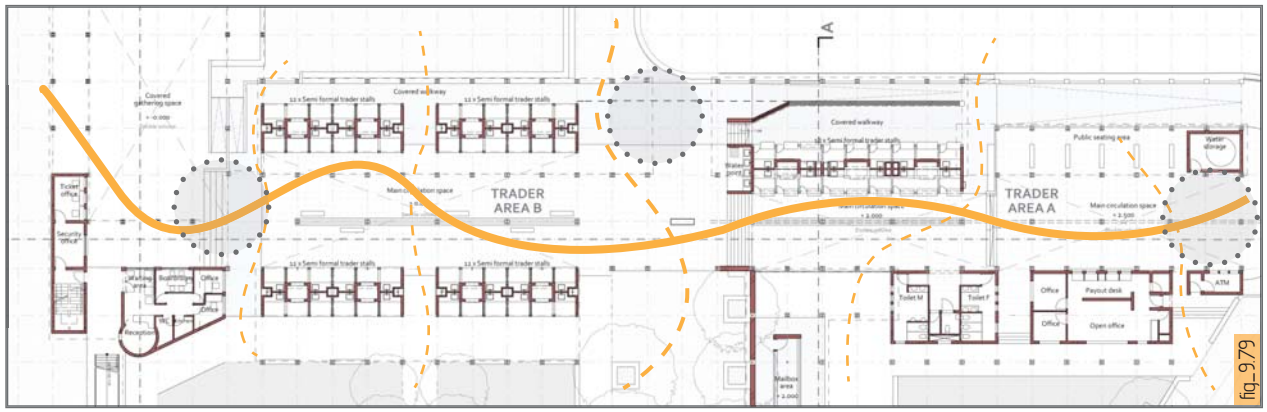
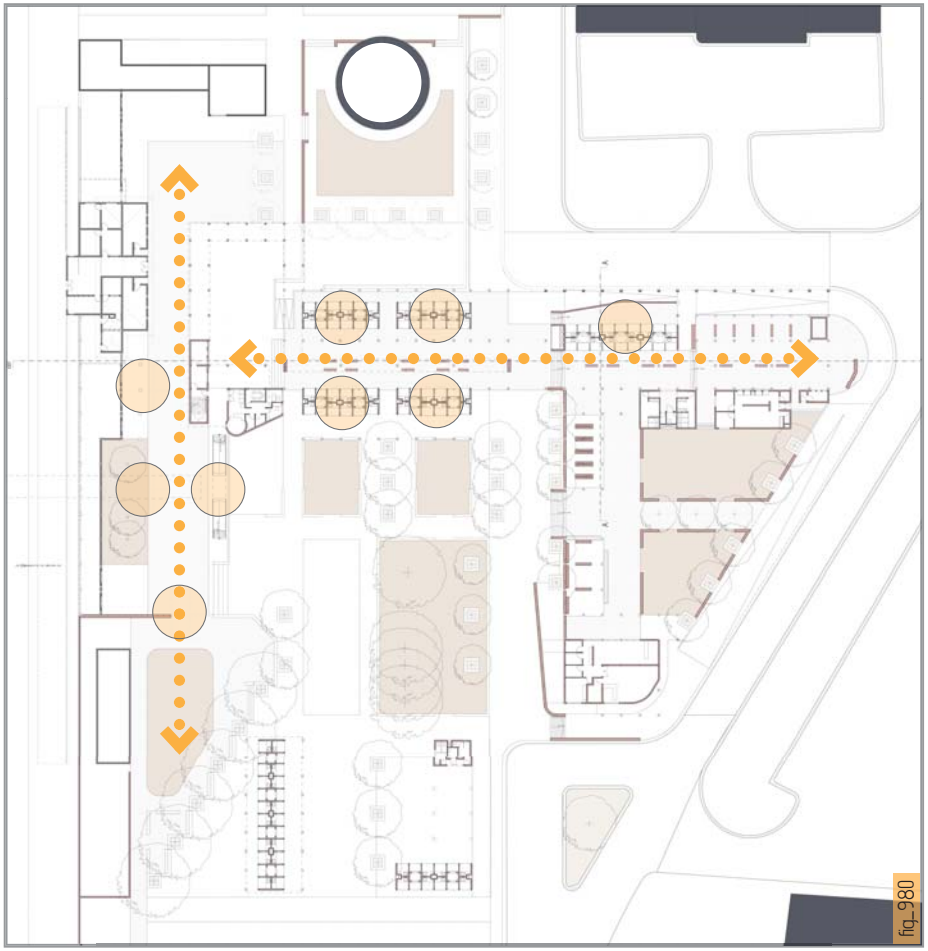



**Fig_9.77** Inappropriate stall configuration and spacing
**[Watson, V. & Behrens, R, 1996: 214 - 215]**

**Fig_9.78** Appropriate stall configuration and spacing
**[Watson, V. & Behrens, R, 1996: 214 - 215]**

**Fig_9.79** Plan illustrating pedestrian circulation through stalls
**[Author, 2012]**



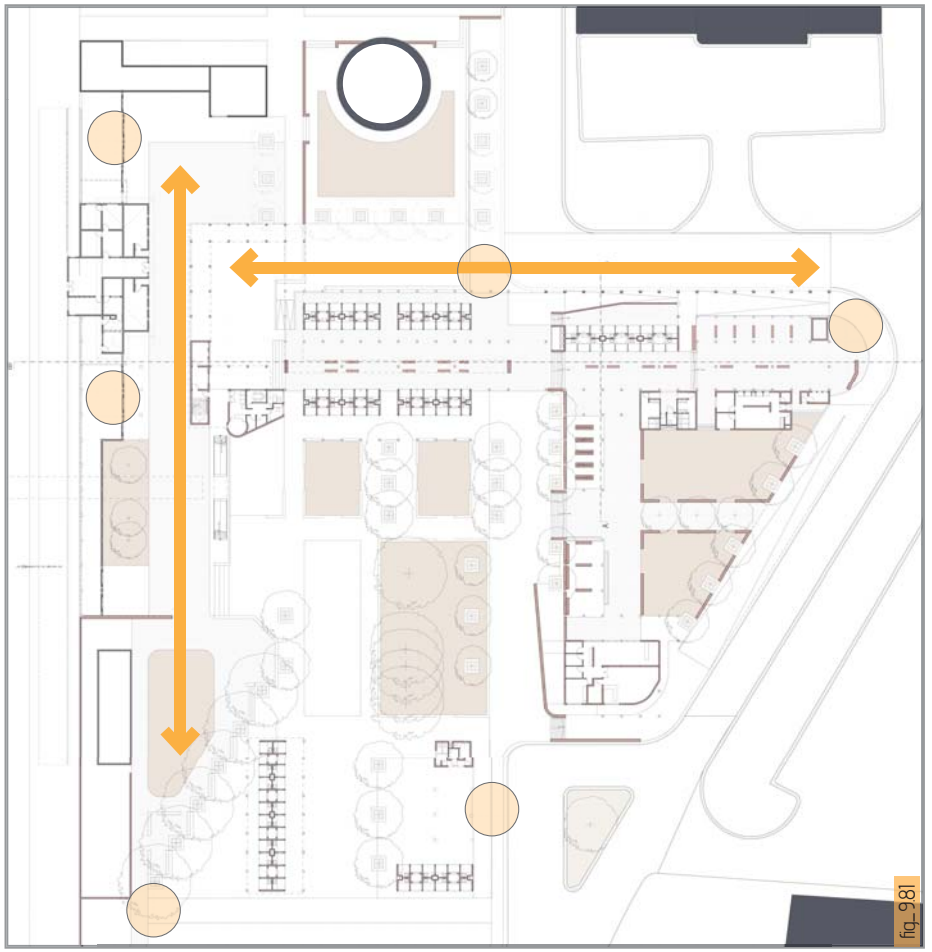




**Fig_9.80** Trader location and circulation **[Author, 2012]**

**Fig_9.81** Commuter location and circulation **[Author, 2012]**

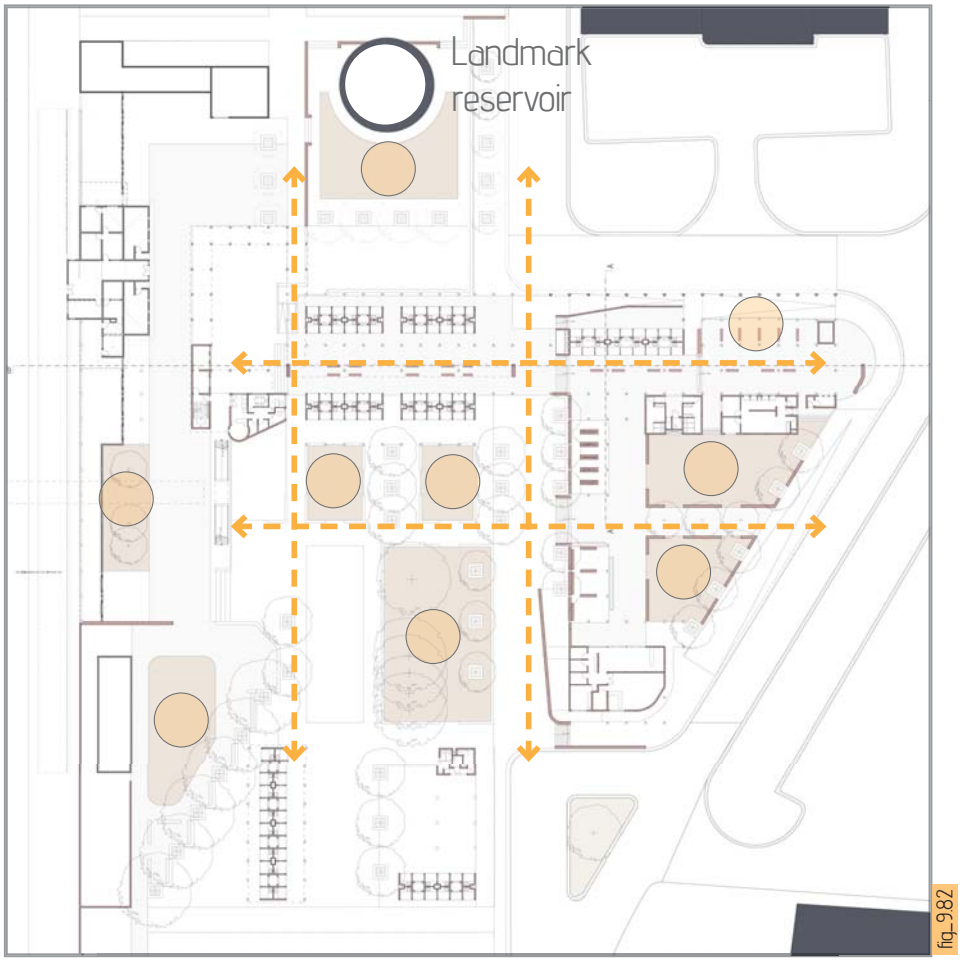
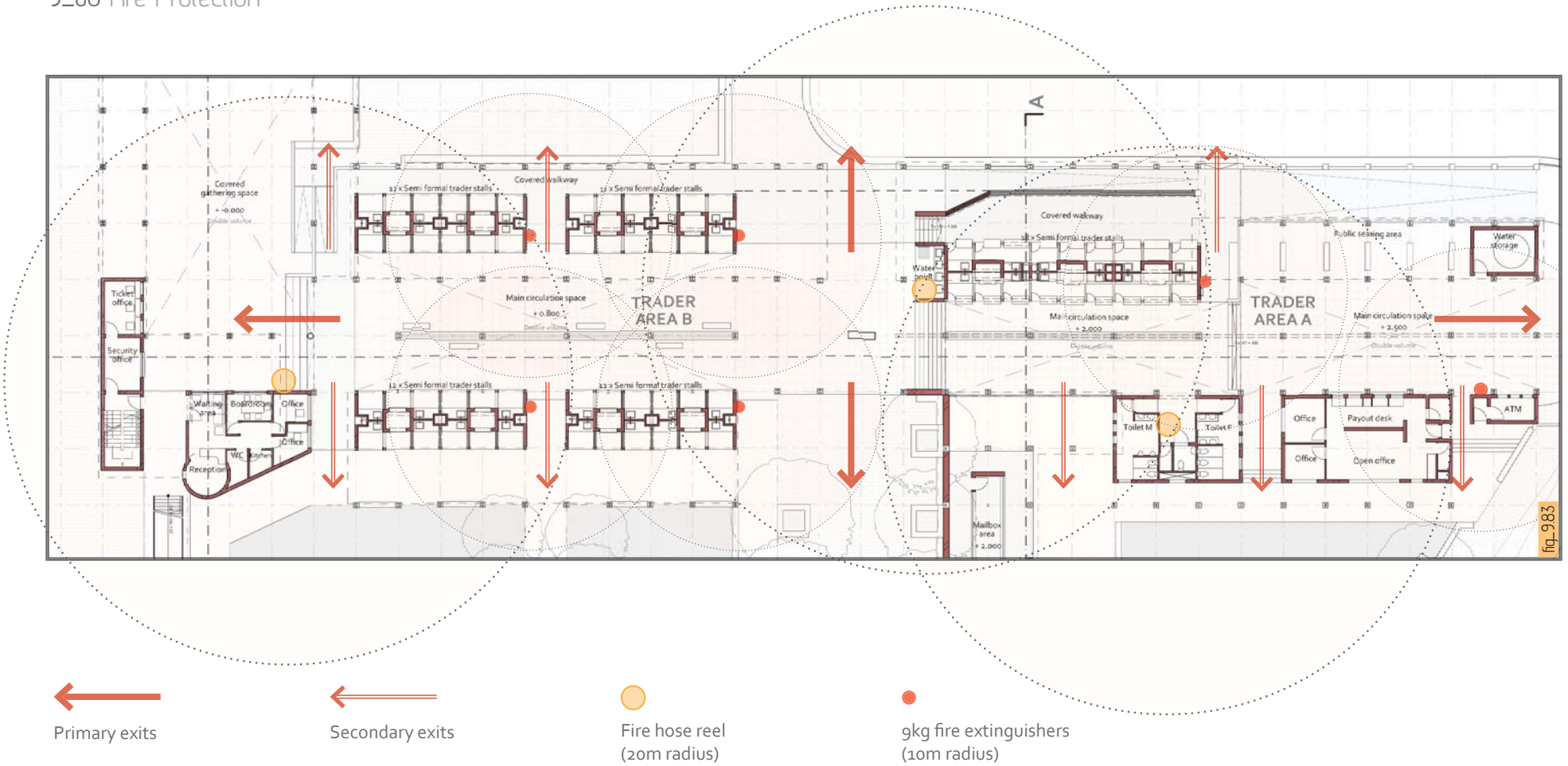



**Fig_9.82** Passer-by user location and circulation[**Author, 2012**]

# 9_06 Fire Protection




Primary exits

Secondary exits

Fire hose reel (20m radius)

9kg fire extinguishers (10m radius)

**Fig_9.83** Plan illustrating fire protection for the main building
**[Author, 2012]**

## 9_07 Renderings

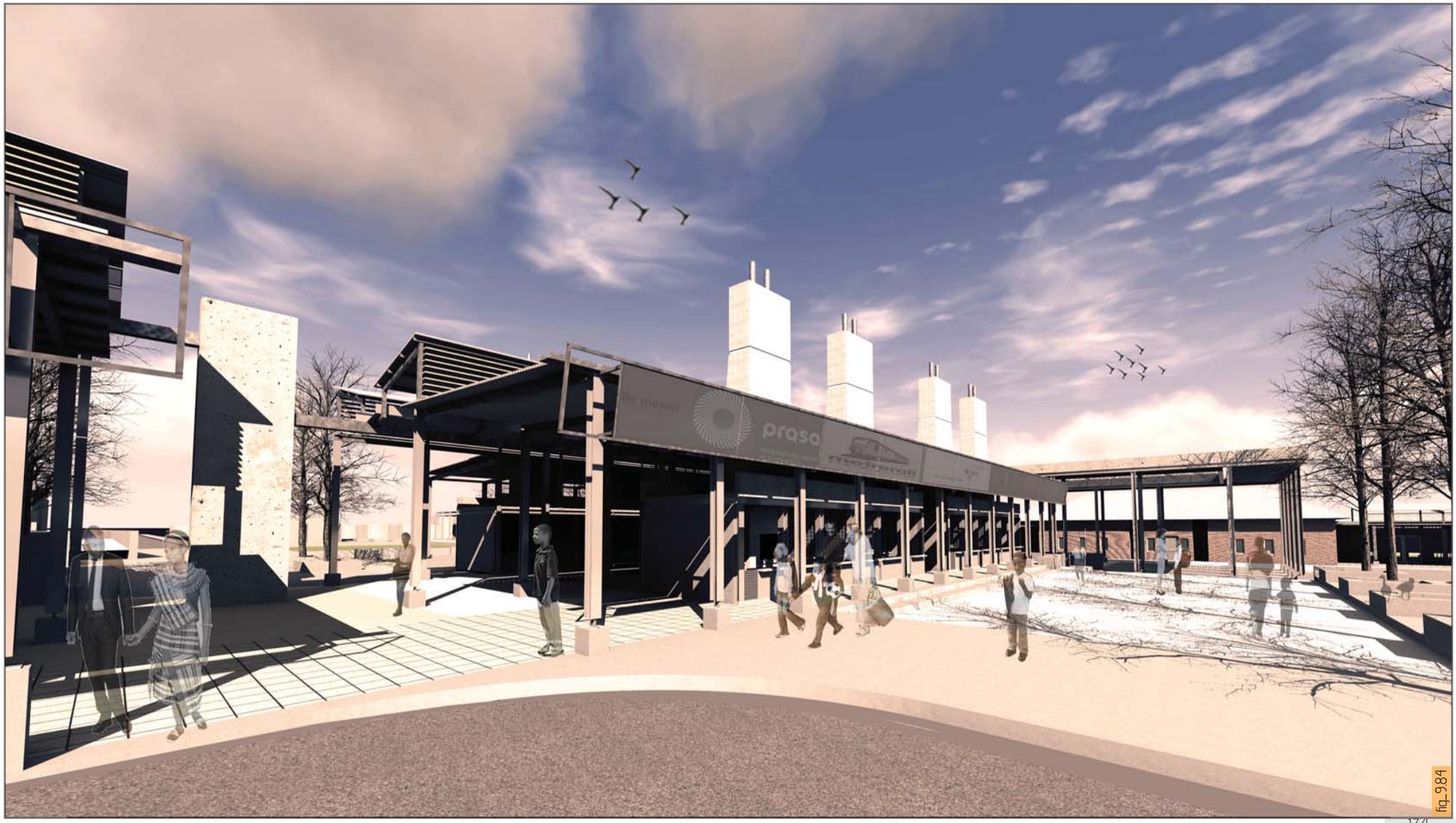



fig_984

fig_985

fig_9.86

## 9_08 Conclusion

With the increasing rate of urbanization and population growth in South Africa, the importance of public transport and its role in structuring the urban landscape has to be taken seriously.

By recognizing this crucial form of transport, sustainable communities can be created in an otherwise disconnected and fragmented urban fabric currently present in South Africa.

Hammanskraal, which is used as an example in this dissertation, is one of many typical townships which rely on public transport and a vibrant informal trading culture to sustain a form of livelyhood, be it far below the poverty line.

By creating well designed public spaces within these disadvantage communities, a variety of common problems associated with them could be cured. Public spaces should include porgrammes that are lacking within these communityies as well as provide ease of access to facilities needed for everyday routine and business.

Acknowledging the role the informal trading sector can play in creating a more vibrant and memorable public space, is one of the key lessons South African architects should learn.

A place is made by the people who inhabit it, therefore architecture becomes the stage onto which our everyday lives unfold, with our interactions and experiences as the actors.

Buildings were used to form, mold and enhance the spatial layout of the Hammanskraal commercial presinct, but it is its people who will enrich, inform and sustain its heart.

**Fig_9.84** Image of stalls and entrance next to main road leading to the station **[Author, 2012]**

**Fig_9.85**Image of post boxes and southern entrance into building **[Author, 2012]**

**Fig_9.86** Image of the main building entrance on the eastern facade **[Author, 2012]**

fig_10.01

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**Fig_10.01** Pedestrian bridge over the river **[Author, 2012]**

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# Addendum

## Final model