6. CONCEPTUAL EXPLORATION

6.1 Site specific Exploration

Fig 6.1 Image collage author - Indicating existing activities on the site

Activities on the site include mainly informal retail and trading, brick and building material sales and informal taxi ranking on the corner of Hans Strjidom and Hinterland roads. Several informal structures were erected to facilitate trading.

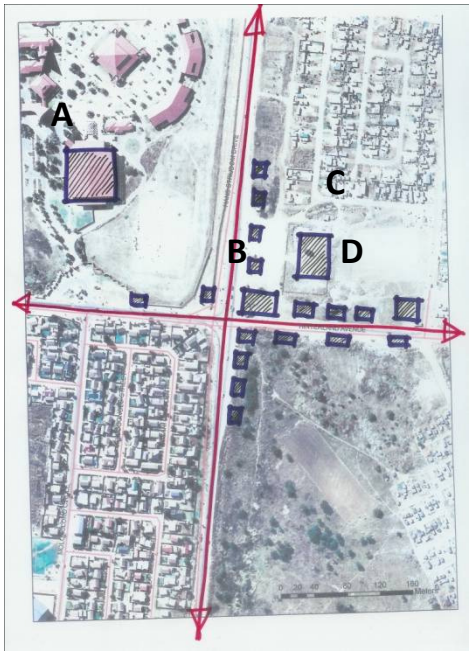

Fig 6.2 Indicating the existing retail edge on Hans Strjidom Road and Hinterland Road

A – The Mamelodi campus

B – Retail activities on the corner of the Hinterland intersection and Hans Strjidom edge

C – Brick and building material sales

D – Informal taxi ranking and taxi holding area

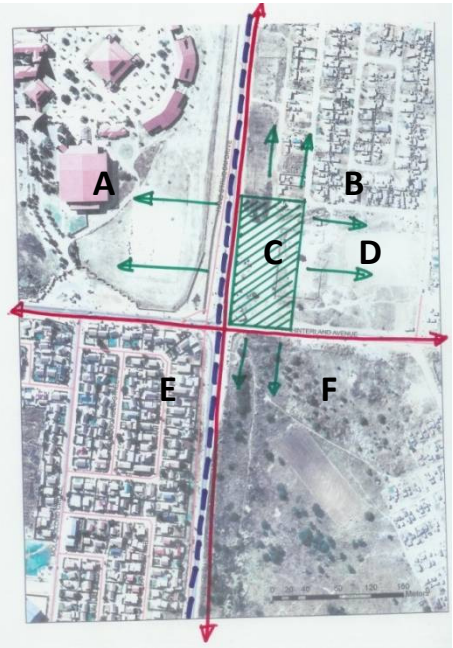

Figure 6.3 Indicating the relation of site to existing features and built environment

B – Residential/ Bonded housing with informal infill

C – Informal retail activities

D – Brick and building material sales

E – Residential / Bonded housing

F – Informal housing

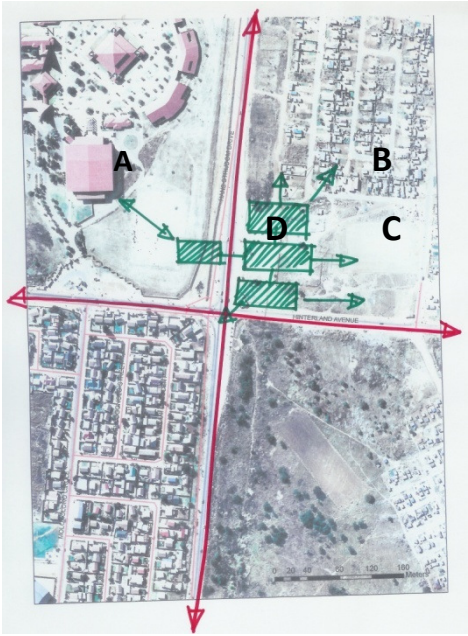

Figure 6.4 Illustrating the proposed zoning areas of the site to determine design intervention

A – The Mamelodi UP campus

A - Academic institution. Design intervention to relate to the campus . Any intervention should be in response to the campus and its activities.

B – Residential zone to respond to residential /urban environment to the eastern side of the site

C – Building and retail zone as response to the existing retail activities on the site. Existing brick and building material retail activities operating in this zone.

D – Retail, trading and transport zone. This zone is characterized by informal street corner trading activities, taxi and pedestrian movement and informal taxi holding and washing.

Figure 6.5 Illustrating existing and proposed circulation on the site with roads and pedestrian routes connecting the site and UP campus.

Existing main roads

Existing secondary roads

Proposed secondary roads

Proposed pedestrian routes circulating the site

There is significant pedestrian movement on the site. People move past the site along Hans Strjidom in a north/south direction and east/west along Hinterland Road.

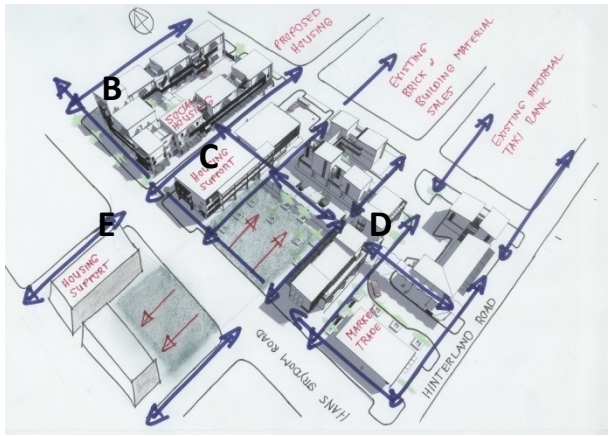

Figure 6.6 Illustrating proposed site layout as response to the site

B – Social Rental Housing developed by a Housing Institution with visual and phsysical connection with residential environment and proposed Housing Support Centre at C.

C – Housing Support Centre as combined project by a Housing Institution and the University of Pretoria(Mamelodi campus). The Housing Support Centre as response to the housing character of the site, fast growing formal and informal residential character of the urban environment, housing need and housing research environment of the university.

E – Proposed Housing Support Centre with housing research facilites , connecting the university with the residential urban environment, acting as bridge between the university and urban society. C and E are visually connected by means of a open space/courtyard/social gathering place.

D – Market and trading facilities with link to taxi ranking site. Proposed market and trader structures as response to the existing informal trading character of the site.

B, C and D to be connected with pedestrian circulation routes to promote pedestrian movement and permeability on the site. B,C and D to emphasize and strengthen the existing retail edge in Hans Strjidom and Hinterland Road.

Figure 6.7 and 6.8 Building material and brick sales on eastern part of site

6.1.1 Zoning and Site Layout

Built structures comprise of:

1. Residential (private spaces); and
2. Public/commercial zones.

Figure 6.9 Zoning and Site layout

6.1.2 Internal Courtyard and Public Courts

The design possibilities of courtyard housing result in various socio spatial qualities. Courtyards provide sociable spaces with a spatial system and inherent social logic to it and could be seen as a generator of contact between people.

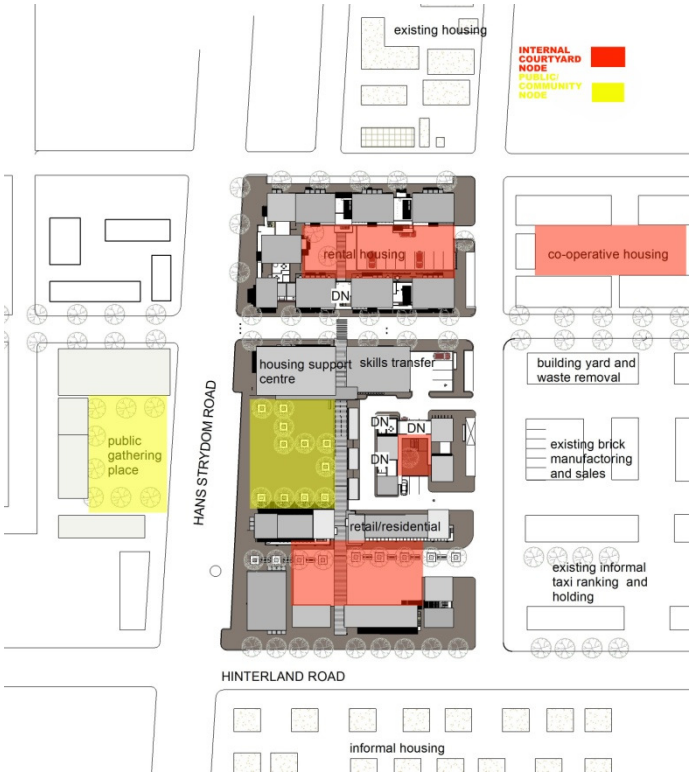

Figure 6.10 Internal and Public Courts

6.1.3 Pedestrian Circulation

- Formalisation of street trading and the provision of more permanent home for large number of public transport lead to increased pedestrian traffic on Hans Strjidom and Hinterland Road. Large number of pedestrian traffic enter the site on route from the taxi ranking site on Hinterland Road.
- Trading edge encourage pedestrian traffic through site.
- Trading facilities on the public square/gathering place, encourage pedestrian traffic on the site.

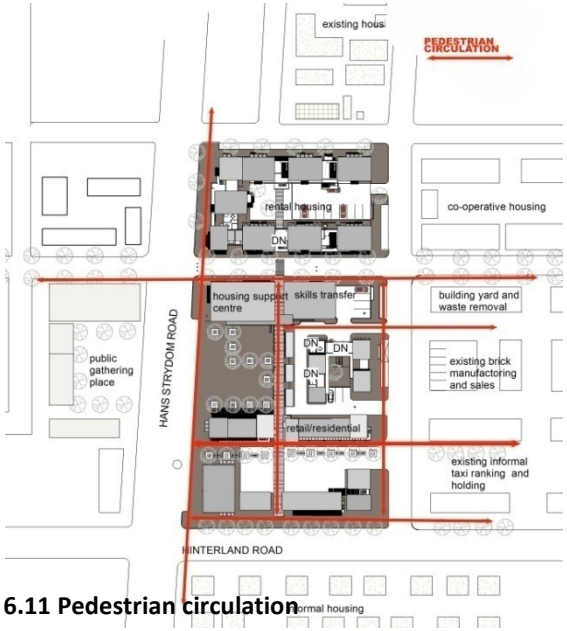

Figure 6.11 Pedestrian circulation

6.1.4 Vehicle Circulation

Hans Strjidom serves as main transport corridor connecting Mamelodi and the Eastern suburbs of Pretoria. Existing taxi ranking and holding on Hinterland Road lead to increased traffic on Hans Strjidom. Most Mamelodi commuters are dependent on minibus taxi transport. New infrastructure is needed for taxi industry, housing support visitors and trading informal street traders.

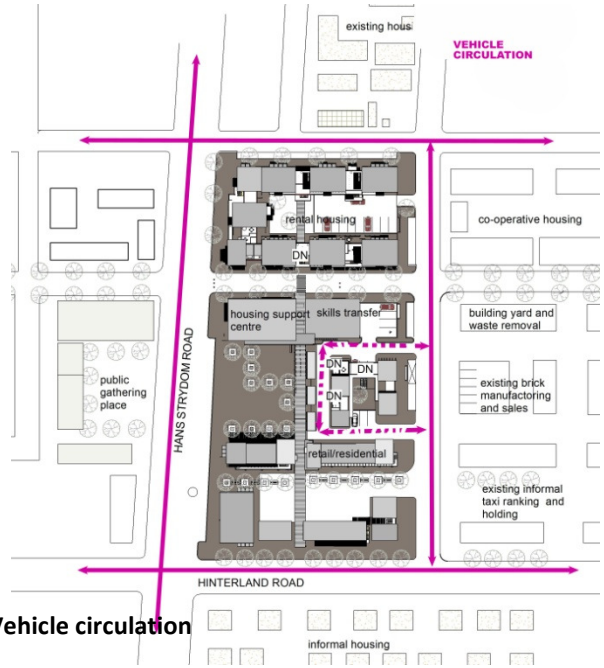

Fig 6.12 Vehicle circulation

6.1.5 Waste Removal

The following figure illustrates the circulation of waste services and refuses collection points in the site. Refuse collection points are well provided for at the housing node, housing support centre and market and trading area.

Figure 6.13 Waste removal

6.1.6 Storm Water

On site storm water to be directed towards an existing storm water/ street drainage channel on the western side of Hans Strjidom Road.

Concrete storm water pipes to be unreinforced concrete non-pressure pipes to comply with SABS 677.

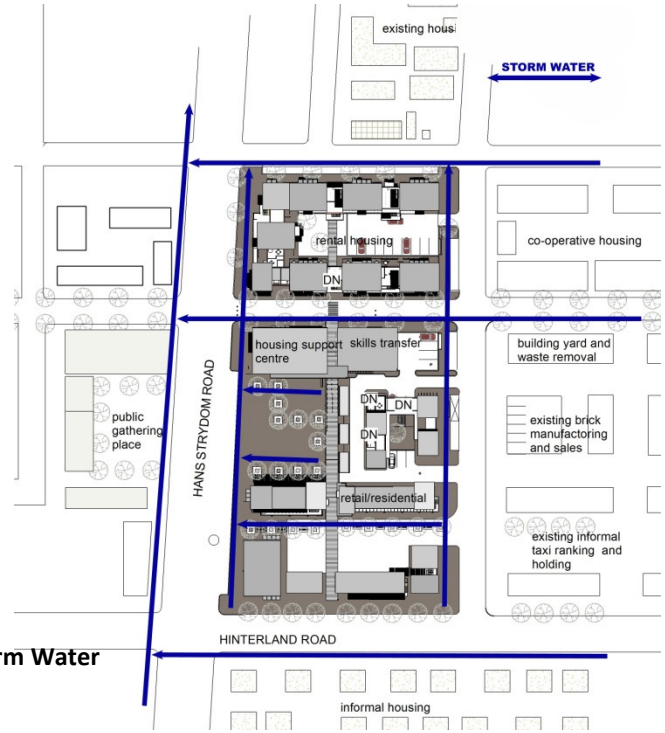

Figure 6.14 Storm Water

6.1.7 Parking

The following figure to illustrate parking provided for each precinct on the site.

Figure 6.15 Parking

6.2 Design Exploration

Design and conceptual considerations to be explored during the conceptual phase:

- Site-specific analysis indicate a mixed-use development with residential, commercial, trade, public and social amenities.
- The project to be connected to the UP campus by means of a Housing Support centre and social gathering place/open space on both sides of Hans Strjidom.
- Any project should strengthen the trading and social character of the site.
- Residential units to be mixed use and allow work, live and recreation.
- Exterior circulation walkway's to allow visual connection with Hans Strjidom Road, with secure, courtyard spaces and semi-private spaces from within.
- Residential units should target the low-income group. Social Rental Housing being an option for low income dwellers.

- Streets, circulation routes and walkways should be treated as social spaces and enhance socializing.
- Design of residential units should comply with very high human sustainable factor.

From literature studies, Greater London Authority (2006) and SHIFT spatial recommendations, the following spatial qualities should be kept in mind:

- Units to have minimum floor areas of no less than 30m2 for bachelor or 1-bedroom units.
- Dwelling should be able to accommodate a mixed use of activities, e.g. work, live and play.
- The need for privacy with suitable separation of bathrooms and WC's and rooms for sleeping by adolescents and adult members of the opposite sex, except husband and wife.
- Suitable internal storage space.
- Private exterior spaces such as enclosed external balconies or gardens.
- Multifunctional internal spaces. Bedrooms should be designed as places for privacy, study and recreation, not only for sleeping and dressing.
- Internal spaces e.g. trading spaces should be convertible and multi- function.
- Security. Residents should be able to leave their children in a secure environment. Access to the residential development should be controlled.
- Transition of public and private spaces should be well designed.
- Resident should be able to 'age' in their units.
- Wider span between structural walls enhance future expanding and remodelling of the building and extend the life of the building.
- Climate responsive design principles apply.

Table 6-1 summarises proposed housing standards and spatial design for medium density housing.

Fig 6.16 Image collage by author 2008, illustrating the retail edge and possible design of retail edge living units. The concept of live work, mixed use units to be explored.

Fig 6.17and 6.18 Image by author, 2008. The language of mono-pitched roof and corrugated sheeting structures are dominating in the area.

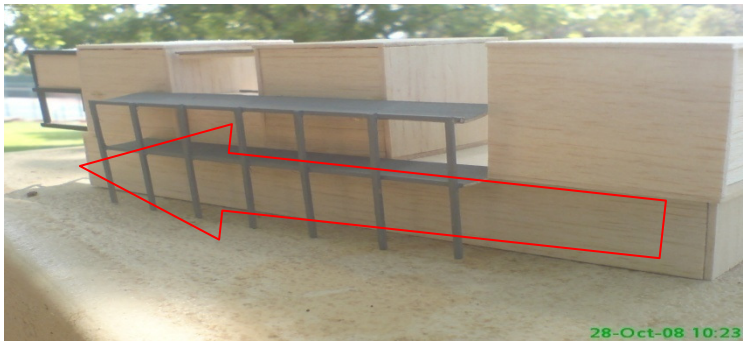

Fig 6.19 exploring the concept of circulation on first floor street level with surveillance of street and public space. Living units to be arranged around courtyards with retail on ground level.

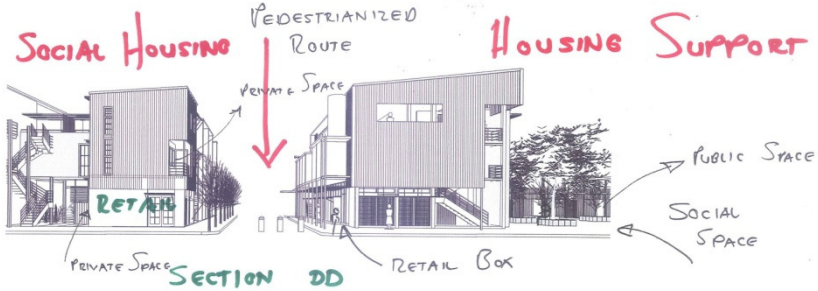

Fig 6.20 Exploring with mass and building height. Pedestrian routes should be a design priority and respond to the social character of the site.

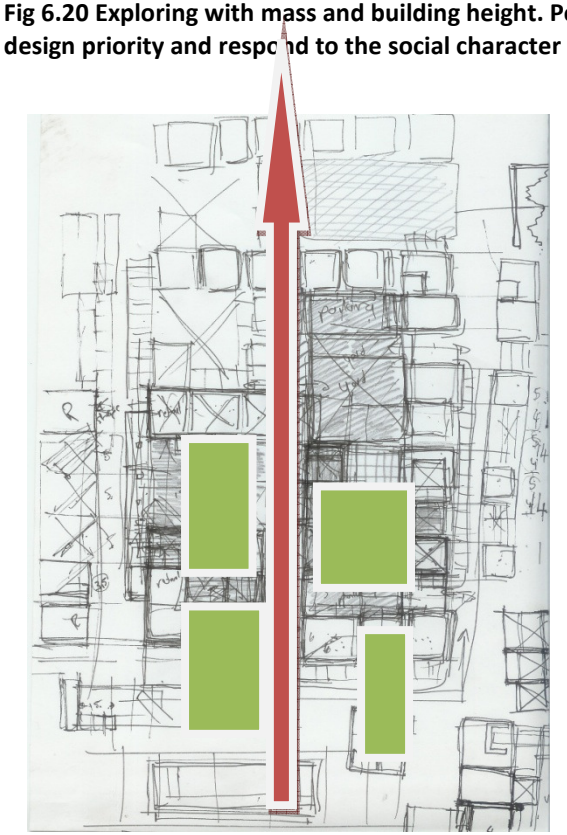

Fig 6.21 Exploring the concept of pedestrian routes along an axis, flanked by courtyards and public spaces.

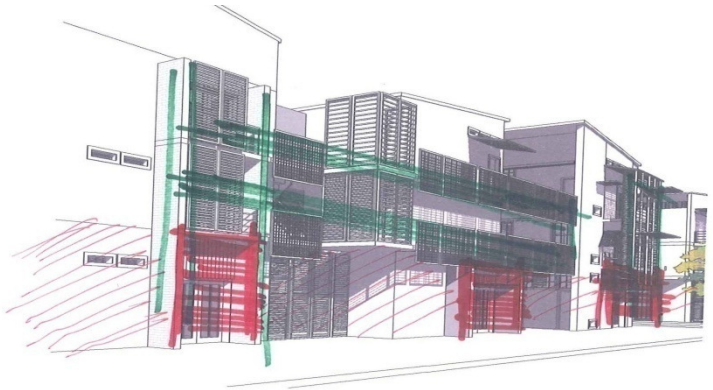

Fig 6.22 Circulation as sociable spaces on street interface

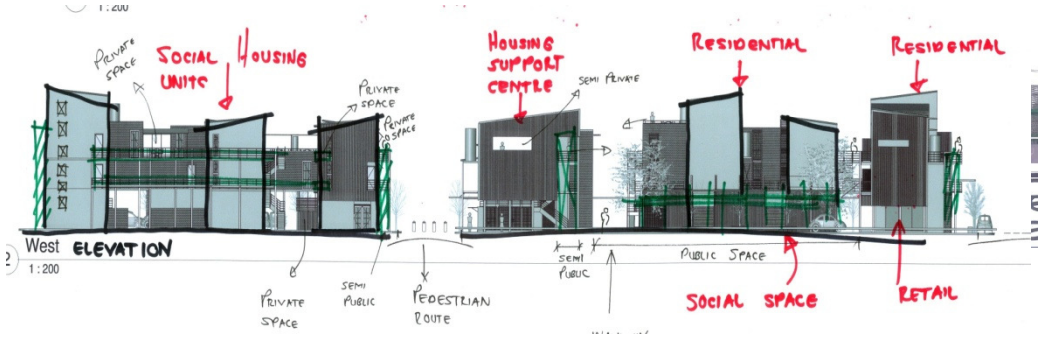

Fig 6.23 Exploring with mixed use buildings, trading zone and pedestrian circulation through the site. Interfaces and hierarchy of spaces should be dealt with.

Fig 6.25 Exploring live/work units on trading edge

Fig 6.26 Trading structures designed on a pedestrian route. Pedestrian routes should penetrate buildings and function as important feature of the project Trading area with pedestrian routes emphasize the social character of the site.

6.3 Climate Responsive Design Principles

All built structures to be seen as climate filters where the filtering mechanism is related to:

- Micro and microclimate.
- Building form and fabric.
- Plant and equipment.

For purposes of this design, the PASSIVE MODEL OF CLIMATE MODIFICATION should be considered. To minimize energy consumption, passive energy saving systems such as optimized cross ventilation, solar control and thermal loading are implemented. (Hyde, R. 2000 : 56)

Passive building model:

- Uses no plant or equipment to modify climate;
- Internal temperature follows that of nature;
- Thermal performance be kept at external shade temperature; and
- Building should be narrow, with cross ventilation and stack effect from low-to-high openings.(Hyde, R. 2000 : 56).

Roof:	Light coloured to reflect solar radiation. Insulation to ceiling for improved thermal performance. Reflecting foil under roof to reflect radiation.
***Walls**:*	Medium to heavy mass with shaded windows in summer. Windows to admit night ventilation. Avoid windows to the west.
Floor:	Light coloured to reflect solar radiation. Solid massive and ground connection.
Plan:	Orientation long axis east-west. Smallest building aspect to east/west to reduce solar gain.
Courtyards:	Light and ventilation/cool air from evaporative cooling

The following table indicates design considerations for hot/dry-moderate climate (Mamelodi):

Table 6.2,3 Design considerations for sustainable housing, (Hyde, R 2000 : 57)

Climatic	Climatic elements	Climate method	Response
	Insulation	Minimize heat loss in winter and heat gain in summer	Large overhangs for excluding summer sun
			Large windows facing winter sun
	Large diurnal temperature variation	Utilize diurnal temperature variation For summer cooling and winter heating	Higher mass walls with large time lag
	Summer heat	Minimize insulation in summer	Roof insulation or ventilated roof
		Utilize ventilation in summer	Large openings with cross ventilation