

8. DESIGN IMPLEMENTATION

8.1 Markets and Trading Area

8.1.1 Objectives

The approach to the project involved addressing the fundamental concept of establishing a dynamic public realm that could support:

- an informal and formal trading zone for commuters
- provide a pedestrian link between taxi rank and Housing Support Centre
- provide rentable lockable trading units for retail purposes with storage facilities
- different levels of informal trade, namely small, medium and larger scale
- encourage formal and informal economic and social activities
- a positive public space/public realm
- encourage pedestrian movement
- sufficient public ablution and washing facilities

A large part of Mamelodi's commuter population is dependent on minibus taxis for daily transport. With an existing taxi ranking site in Hinterland Road, pedestrian traffic and informal trading dominate the site.

The market and trading zone were identified as important catalytic projects to link the existing informal taxi-ranking site with the Housing Support Centre and future urban renewal projects along Hans Strijdom and Hinterland Road. The market and trading zone form part of the urban renewal programme for the site allocated for this project.

The formalisation of the street trading community and the provision of more permanent trading structures, were the main drivers of the project. Formal retail stores are located along Hans Strijdom and Hinterland Road, while smaller and more informal trading structures are located along pedestrian routes and edges.

8.1.2 Programme

Trading opportunities include a mixture of enclosed and open trading shelters, a market trading canopy, storage facilities, ablutions, and water points and landscaping.

Pedestrians arriving on foot will enter the market on a covered pedestrian walkway or movement route, moving in the direction of the Housing Support Centre. The walkway is flanked with retail units to the right.

The market and trading zone serve as a trading forecourt to the Housing Support node and taxi ranking facilities on Hinterland Road. The Hans Strjdom and Hinterland Road intersection is perceived as a hub of informal activities and pedestrian movement. The proposed market area would serve as trading area, capitalizing on the energy created by pedestrian and vehicular movement (Ewing, K. 2005). The development focuses on the need to direct and allow pedestrian flow from the taxi rank on Hinterland Road, commuters from future public Bus Rapid Transport system and

pedestrian movement along Hans Strjdom, in a south-north and east-west direction to residential areas, Housing Support Centre, UP and other amenities.

The market takes the form of steel/framed structures with rentable spaces intended for market activities. Material used would be basic steel frames, masonry infill and metal roof sheeting. The market is designed to allow for flexibility and maximum pedestrian movement. Walkways allow for possible trading, pedestrian movement, waiting and socializing (Ewing, K. 2005).



Fig 8.1 Image of proposed market

8.2 Housing Support Centre

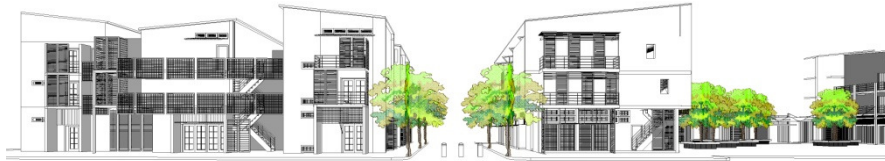


Figure 8.2 Western elevations HSC and Rental Housing (left) with pedestrian route

8.2.1 Objectives

The conceptual basis for a Housing Support Centre, is the vision of achieving a community that is self sufficient and informed in house building practices, equipped with construction skills and having access to spatially well designed and well built dwellings.

The Housing Support Centre enables disenfranchised communities to access and take ownership of their dwelling resources and needs. Targeting the lower income group, skill and knowledge transfer, could stimulate the local housing sector, improve the quality of housing and generate independence. An attitude of

responsible stewardship of common housing resources is fostered to encourage the conversion of degraded, dilapidated and unsustainable housing practises into more sustainable, lasting and comfortable housing options.

These are achieved by housing support in the form of soft and hard skills transfer, training, information, technical advice, legal and social support.

8.2.2 Programme

The HSC comprises of:

1. Two rectangular shape buildings/sections arranged on both sides of a pedestrian circulation axis;
2. A covered pedestrian walkway;
3. Trading/commercial units; and
4. A courtyard space.

The first building to be the proposed soft skill transfer and administration section and would be home to a Social Housing Institution. Housing Departments, providing information and

housing support could be tenants in this building. The building is designed as a three-storey reinforced concrete frame office building on Hans Strijdom Road.

The second of the two proposed buildings to be a steel/portal frame workshop area for skills transfer, workshop training and more hard skills orientated training. The Peoples Housing Process or any organization actively involved in hard skill training could be a tenant using the workshop facilities. The workshop facility is visually connected with more workshop facilities, trading and material manufacturing activities across the street (to the eastern side of the HSC). An existing cement brick manufacturer operates from this site.

The covered pedestrian walkway must be a linear axis, connecting the housing support centre with the taxi drop-off and market area.

The walkway penetrates the HSC and visually connects the Social Rental Housing project with the HSC and trading area.

Trading/commercial units, rental and lockable spaces of 2.5x3m in size must form a linear edge along the courtyard space.

The courtyard space must provide an area for social gathering and trading.

The office block on Hans Strijdom, a joint venture between a social housing institution and the University of Pretoria, is arranged around a triple volume entrance foyer/reception area. The programme of the office building, allows for soft skill training, information, support, advice, social rental administration and most housing related advice.

The office building comprises of a triple volume reception area, information helpdesks, waiting areas, office space, boardrooms, tearoom/lounge, staff room, kitchen area, vendor/trading stores and storerooms. The triple volume foyer is a major source of natural light, penetrating the building from the south.

Pedestrian circulation is perceived as an exterior space and located on the southern façade of the building. Exterior circulation contributes to a visual and social connection with the social activities in the courtyard/social gathering space. Circulation routes are extended social spaces and exterior circulation connects the office building with the workshop section across the pedestrian axis.

Access to the building is via a covered pedestrian walkway, crossing the social/public node and passing the retail edge. Retail opportunities are created along the pedestrian circulation axis and maximise trading, formal and informal on the site. The covered pedestrian walkway offers retail and socializing opportunities.

8.2.3 Design Parameters

- Use of natural light, passive ventilation and visual contact with the outdoors were taken as design parameters.
- The building should fit into its direct residential context in terms of scale and urban fabric.

- The building should have a visual and social connection with Hans Strijdom Road and with the proposed courtyard and social gathering space.
- Individual offices are placed with visual connection to the courtyard, and triple volume space.
- Design to optimise natural climatic conditions with offices to have direct north orientation and screen walls to block out the western sun.
- A social and visual connection with Hans Strijdom Road is achieved by projecting the facade forward from the row of supporting columns and adding balconies with movable, mild steel frame, sun panels with timber slats to protect balconies from the western sun (Digest of South African Architecture, 2007/8 : 126).



Figure 8.3 Circulation walkways connecting with exterior space with modular steel balustrades

Figure 8.4 Pedestrian circulation axis, functioning as vertically articulated spine, set between two flanking wings

8.2.4 Plan and Layout



Figure 8.5 Floor Plan Housing Support Centre

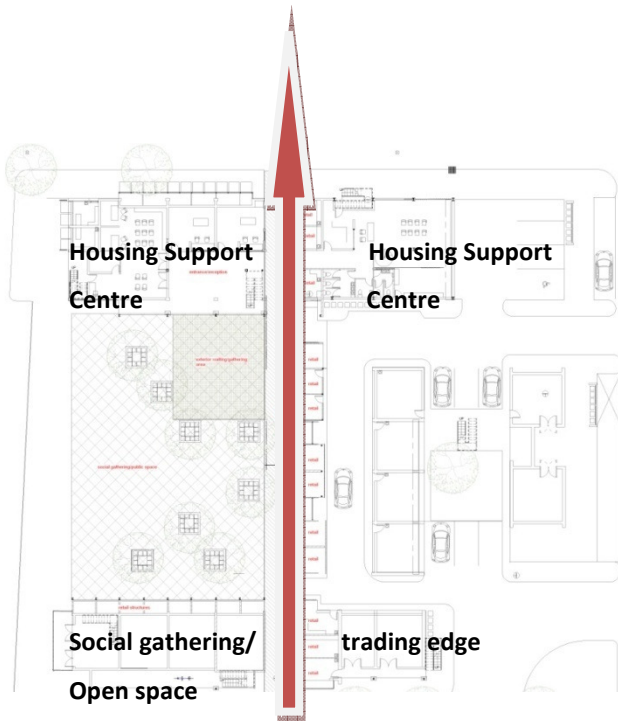




Figure 8.6 Floor Plan – Level 1 Housing Support Centre

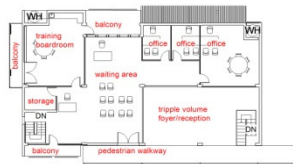


Figure 8.7 Floor Plan – Level 2 Housing Support Centre



Figure 8.8 Public gathering space with retail edge

The opportunity to interact is a palpable quality of the place. The Housing Support Centre is proposed as part of a social and public precinct. Opportunity for social gathering, waiting, informal and formal trading is created with a public open place.



Figure 8.9 Trading opportunities are created along the pedestrian axis and edge of open/social gathering space



Figure 8.10 Housing Support Centre seen from Hans Strijdom Road



Figure 8.11 Housing Support Centre – Hard Skills transfer. Steel/portal frame workshop area for training and hard skills orientated training

8.3 Social Rental Housing Units

8.3.1 Objectives

Table 8.1 Indicating the objectives of this housing project:

- an alternative for, overcrowded tiny houses with no design flexibility, consideration for cultural diversity, privacy or personal space.
- encourage a medium density rental development, which is innovative, responsive to the site's visual, environmental and cultural characteristics and in accordance with the desired future characteristics of the area,
- provide a range and style of housing which is appropriate to the diversity of the people of Mamelodi,
- provide a mixed use project with synergy of living, working and recreation
- provide flexible and adaptable interior options to ensure spatial usage which could adapt to changing personal needs and lifecycles over a period of time; and
- provide climate responsive design qualities.

8.3.2 Site Analysis and Layout

The site is located on the corner of Hans Strjdom and Hinterland Road, next to the UP Mamelodi campus. The Housing development was designed around a courtyard with integrated community living in mind. The site is ideally located in terms of served by road and rail based public transport, with ample taxi transport and the City of Tshwane's proposed Bus Rapid Transport running along the western border on Hans Strjdom Road.



Figure 8.12 Northern elevation: Social Housing Rental Units

8.3.3 Design Response

From interviews conducted with residents of Mamelodi, literature studies, Greater London Authority Spatial Standards and local precedents studies, the following spatial guidelines to be implemented in the design of the social rental units:

- Units to have minimum floor areas of no less than 30m² for bachelor or 1-bedroom units.
- Minimum space standards apply – 18m² for Living, Eating and Cooking, 5m² for a one person bedroom and 9m² for a two person bedroom (cupboards included).
- 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 8.2 Design response

8.3.4 Security

Security seems to be a determining in most residential developments. Access control and protection of private spaces contribute to a safe environment. The development has only two access points, which allow entrance for residents only. Staircases are secured with steel framed mesh panels and gates. The development is designed around a courtyard space with residential

units on the edge. Units must provide security in the form of passive surveillance. The eastern border could be a fenced steel palisade with a vehicular access gate to the onsite parking provided in the courtyard space.

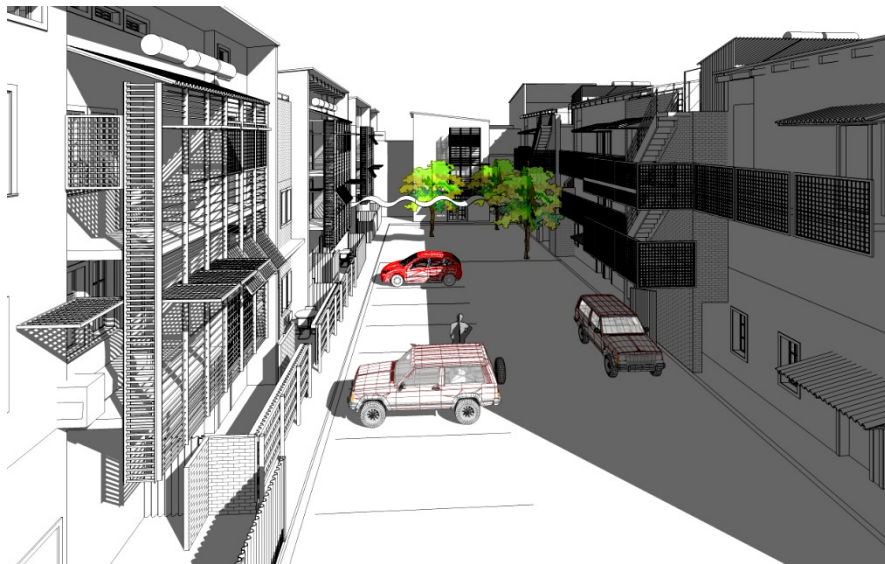
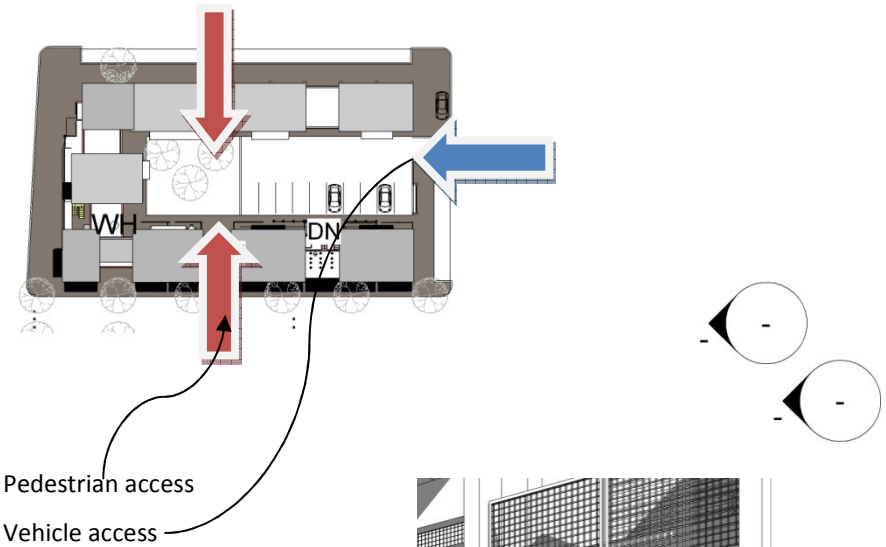


Figure 8.14 Courtyard with secured access control



Pedestrian access
 Vehicle access

Figure 8.15 Access points indicated

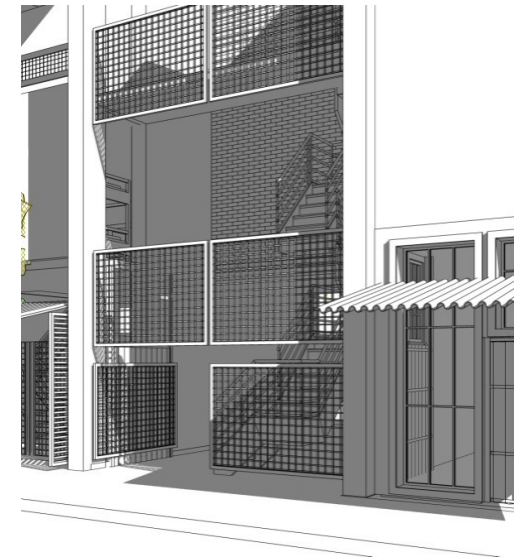


Figure 8.16 40x40x3 mild steel angle frame with mesh welded to frame to form security gates and balustrades.

8.3.5 Unit design

There are 34 units in total. Bachelor units are 32m² in size with one and two bedroom units varying from between 47 and 61m².

Orientation and building height were considered according to the urban framework of the regenerating framework for Mamelodi campus and urban environment, as well as to maximise the living conditions within individual units. Height and distance between blocks ensure adequate sunlight during the day.

Three storey buildings:

1. Provide protection for internal courtyards against prevailing wind.
2. Offer visual and sound barrier to protect development from noise and visual pollution from Hans Strijdom Road.
3. Provide elevated views surrounding Mamelodi and campus.

Ground floor units with floor to ceiling height of 3500 to ensure storage space and flexible use space. Units have been staggered to

get north light into all the lounges. Bathrooms on first floor lead off the living and sleeping section. The kitchen on ground floor is open plan in the ground floor living area. Loft units have been designed with a mezzanine level over the kitchen/bathroom area, creating an extra bedroom or storage area.

The units are built around a central courtyard. Some units have both front and back entrances and others (first- and second-floor units) have access from the walkways only. Upper-floor units are accessed through an external staircase along the southern and northern façade of the block. Low-level walls define small front gardens and entrances to the ground-floor units on the southern block. Small front verandas allow for social interaction with other residents.

A bath is installed (instead of a shower) as it is easier to wash the children and/or clothes in a bath. It makes it possible to provide a shower facility within the bath at a later stage.

TV points, sufficient electrical points, washing machine plumbing and a stove plug should be provided. All units to be provided with

tiled floor finishes within the kitchen and bathroom areas and carpets in the lounge and bedrooms. A kitchen sink, double door standing cupboard and a worktop should be provided. A shelf and a rail in the bedroom provide space for both hanging and stacking of items. Cupboard doors not to be provided in order to save costs (Social Housing Foundation : Project Review Series, 2006).

The top floor units were designed to take advantage of the roof space and have a mezzanine level, which accommodates an extra bedroom. These loft units have a steel staircase with concrete infill treads in order to reduce the footfall noise within and between the units.

The commercial units include live-work units and a few straight commercial units. A roller shutter and grid gate is provided. The live-work unit comprises of a 20m² shop area with a two-bedroom living unit above, suitable for occupation by a small family.

Hard wearing, wood trowelled and brushed concrete walkways were constructed without any other floor finishes applied. The first

flight of stairs to be enclosed as to give a storeroom and bin area but the rest of them are open to bring “lightness” and openness to the scheme.

The development caters for elderly and disabled people in the community. A percentage of ground-floor units closest to public amenities and transport routes were designed for wheelchair access (Social Housing Foundation : Project Review Series, 2006)

8.3.6 Adaptable Housing Typology

Units are designed with adaptable and flexible floor plan options. Interior walls are either timber cupboards or adjustable panels that provide flexible interior spaces and allow residents to ‘age’ in their units. Consideration is given to a design that allows residents to ‘age-in-place’. Housing units will adapt to and support residents’ changing needs as they proceed through different life cycles. Further consideration is given to design certain units that allow several floor plan options without any structural intervention or change.

Units to be designed with fixed structural support/load bearing exterior walls and fixed wet/plumbing core (bathroom and kitchen). Living spaces and bedrooms should have adaptable interior walls. Interior walls must either be sliding panels, mobile wall partitions or timber cupboards that could be removed or adapted to changing needs. Ground floor units with retail opportunities should be designed with sliding panels, enabling a floor layout to maximise space usage. The plan consists of a versatile retail space, separated by mobile wall partitions. During the day the ground floor living space can be made smaller by pushing the partitions back, creating a secluded retail space. At night, the partitions could be sliding open to enlarge the kitchen/living space. Movable dividing walls are mounted on wheels, and ceiling rails that lock into place. Some units must be fitted with mobile cupboards and fold-up beds. Expansion and retraction of bedroom space is made possible by fold-up beds that fit into a boxed wall unit. (Digest of South African Architecture, 2007/8 : 60-61). Certain units to be designed with removable infill panels in the support structure between two units. These panels could be removed at a later stage to incorporate two adjoining

units into a bigger unit or for other purposes. Several floor plan options are designed for the same unit without any structural intervention or change (Social Housing Foundation : Project Review Series, 2006).

Certain units to be designed with removable infill panels (dry walling) in the support structure between two units. These panels could be removed at a later stage to incorporate two adjoining units into a bigger unit or for other purposes.

1. Site layout and ground floor units.



Figure 8.17 Site layout ground floor units

2. Typical unit layout

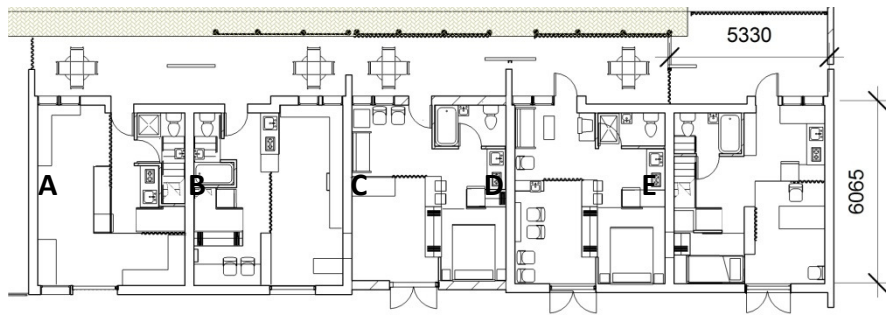


Figure 8.18 Typical ground floor unit

Unit A: 3 Bedroom unit / 71m²

Unit B: 2 Bedroom unit / 64m²

Unit C: Bachelor/1 Bedroom / 32m²

Unit D: Bachelor / 1 Bedroom / 32m²

Unit E: 2 Bedroom unit / 64m²

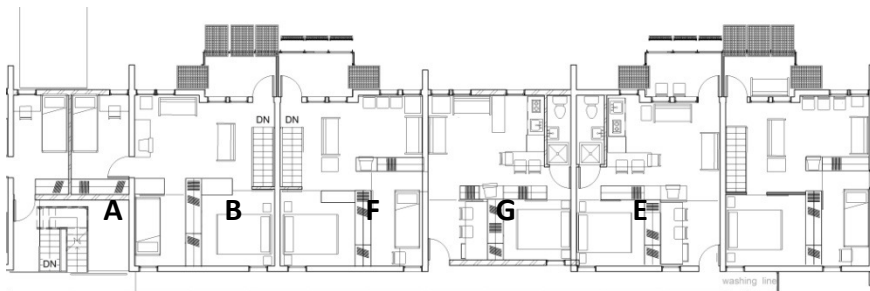


Figure 8.19 Typical first floor unit

Unit F: Bachelor / 1 Bedroom / 32m²

Unit G: Bachelor / 1 Bedroom / 32m²

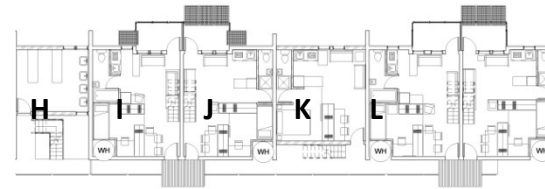


Figure 8.20 Typical second floor unit

Unit H-I: 1 Bedroom with mezzanine / 47m²

Unit J: Bachelor / 1 Bedroom / 32m²

Unit K-L: 1 Bedroom with mezzanine / 47m²

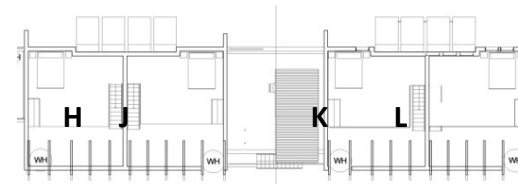


Figure 8.21 Typical mezzanine layout

3. Typical ground floor unit with retail options

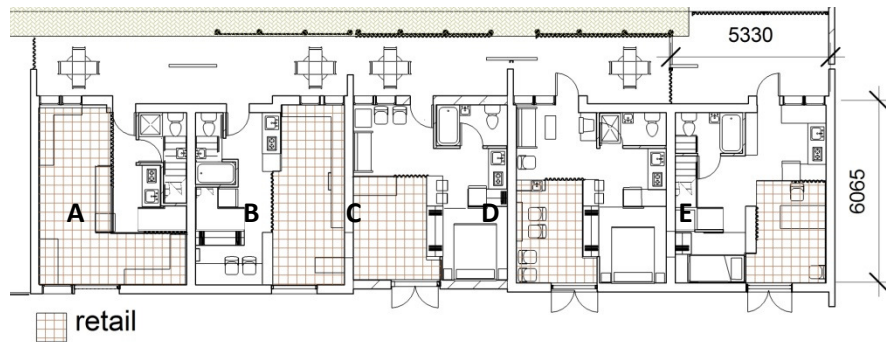


Figure 8.22 Retail spaces

Ground floor units to form live and work spaces on retail edge with street interfaces. Small/limited retail opportunities are viable in these live/work units. Retail/commercial options/suggestions for units A-E include the following:

- Unit A: Bookshop
- Unit B: General dealer
- Unit C: Take a ways/eatery
- Unit D: Hairdresser
- Unit E: Small office space

Retail spaces in ground floor units are separated from living spaces/kitchen with sliding panels. These panels could be closed during office hours to create a semi-private retail/commercial zone. Panels could be sliding open at night to incorporate the retail space into living/kitchen area.

4. Ground floor units incorporating adjacent apartments

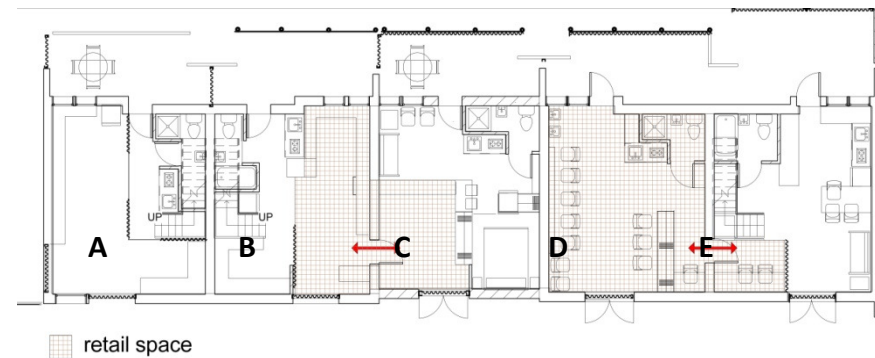


Figure 8-23 Flexible floor plans

Units are resignd with flexible floor plan options. Tenants in unit E, could rent unit D with the option of incorporating the two units. Structural walls between unit D and E, and B and C, are designed with removable infill drywall panels. Drywall panels could be

removed to combine D and E into a bigger unit with floor space of 93m². Timber built in cupboards and room dividers are removed from unit E, to create a new floor plan with bigger kitchen, living area and extended retail space in D.

5. Ground floor unit with disabled facilities

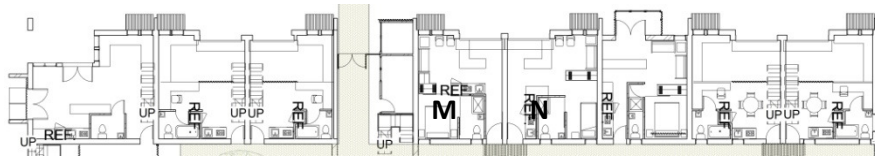


Fig 8-24 Unit M-N: Typical layout of ground floor unit adapted for disabled person.

According to Macagnano (2005), flexibility of design ensures a sustainable livelihood in housing. A flexible home offers the user opportunity to apply hands-on modifications to the physical layout without disruption to the essential layout. Such modifications take shape in the modification of internal partitions, additions for an extending family (birth of children or refuge for relatives) and

possibility for internal subdivision and reduction of space for easier management in the case of a contracting family.

8.3.7 Setback and Building Height

Street widths vary from 6m, to 8m, 10m and 20m with residential units providing active frontages to these streets, the edges of which are animated by the provision of regular entrances, openings, narrow frontages, balconies, stairs and the articulation of facades. This allows for clearly defined transitory zones between public, semi-public and private domains (Mammon, N and Ewing K. 2005)

Building is to be setback a minimum of 9m along the Hans Strijdom frontage to allow a functional retail edge with pedestrian activity. A minimum front boundary setback of 3m applies for buildings adjoining the pedestrianized route on the southern boundary of the development. Minimum front setbacks of 4m apply for the buildings adjoining the northern and eastern boundary.

Cantilevered unroofed balconies, sunscreens and sun blinds may encroach into the setback area.

Building heights vary from 3-4 storeys, according to urban framework for the area.



Figure 8-24 Illustrating spatial relationship between building height and roads

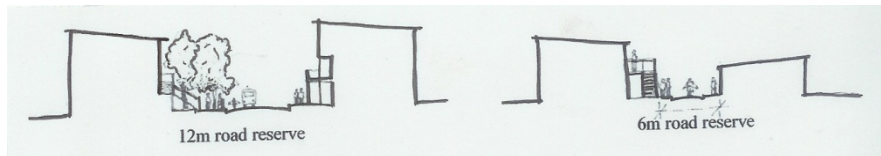


Figure 8-25 Illustrating building setbacks and building height (Mammon, N and Ewing K, 2005)

8 3.8 Mixed Use and Retail Edge

Edges of residential units on ground floor are spaces with rich qualities. Pedestrian circulation through the Housing Support Centre and along Hans Strijdom, create ample retail opportunity for ground floor units on the edges of the housing project. Since many residents are self-employed, live and work units would be an attractive option. Ground floor units are designated to become living and working spaces.

Ground floor units should be converted into trading/retail space. Sliding panels to separate retail/office space from living area, adapting to individual needs of tenant.

Centre-to-centre distance of 6400 and flexibility of floor plan on ground floor, allows for various floor plan variations. From conventional living to small retailer, hairdresser, take a ways, office and spaza shop. Tenants are free to divide the spaces between load bearing cross walls with purpose made sliding panels.

Opening or closing of sliding of panels offer a number of combination options and sizes for retail/living.

Ground floor, with a room height of 3500, is designated as a working and storing zone



Figure 8-26 Ground floor units on pedestrian route with retail edge

8.3.9 Hierarchy of Spaces

Differentiation and transition between private and communal spaces are clearly defined so that people may socialize or withdraw when needed.

The success of this residential developments, hinge on the interface between street and building. Retail edges as part of the street/building interface communicate a sense of interaction. Roads serve as circulation corridors and public space.

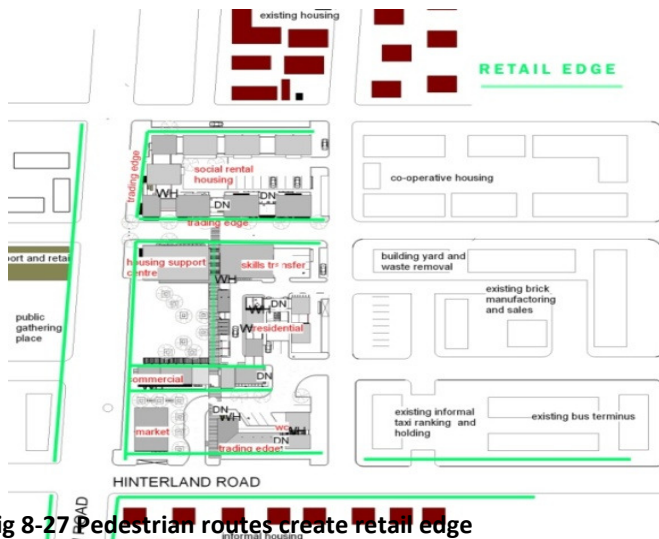


Fig 8-27 Pedestrian routes create retail edge



Public space Private space Private space Semi-private Private space Public space

Figure 8.28 Illustrating differentiation of spaces

8.3.10 Private Exterior Space

The home and the private exterior space is one area where the influences of the outside world can still be measured out at one's own discretion. In this social housing project, the private exterior spaces (balconies) are placed at the transition from private to public space and are particularly exposed (Schittich, C 2004 : 36).

Exterior spaces can make a greater contribution to the private sphere when the boundaries are more enclosed. These should not have an adverse effect on the lighting of the interior living spaces.

In this rental housing project, a cantilevered balcony zone on the northern façade of each unit complements the spatial programme. The latter to create a spatially differentiated exterior space. Balconies are provided with translucent timber slat balustrades with mild steel frame panels. Shading panels act as balcony shutters and when closed, creating a sense of privacy. This space acts as a shady retreat when closed. The external aspect of the units provide in the need for socialising and privacy.

Shutter panels to be fitted with bullet hinges and fixed to a mild steel frame to the one end.

Balconies serve as additional private spaces and can be used as extension of the interior private space. Balconies also relieve the monotony of the façade.

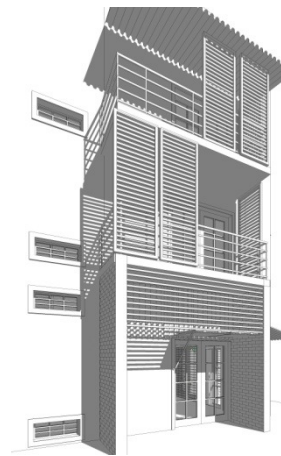


Figure 8.29 Balconies to become exterior private spaces with moveable sun panels; balconies provide an extension of living space.



walkways with a structural topping of 50mm, can be used as pedestrian circulation routes for first and second floor units. Walkways are secured with mild steel framed and mesh balustrade.

Walkways on street interface, allow for passive surveillance of street become an extended social space for visual social interaction. Open/visible walkways provide a more secure and visible route than enclosed, dark corridors.

Figure 8.30 Sun panels to be adjustable to allow balconies to be extension of interior private spaces when closed



Figure 8.31 Sun panels open to allow visual and social interaction with courtyard and street

8.3.11 Pedestrian Circulation

Echo precast hollow core floor slabs allow for an unsupported cantilevered balcony or walkway of 1.2 m. These cantilevered

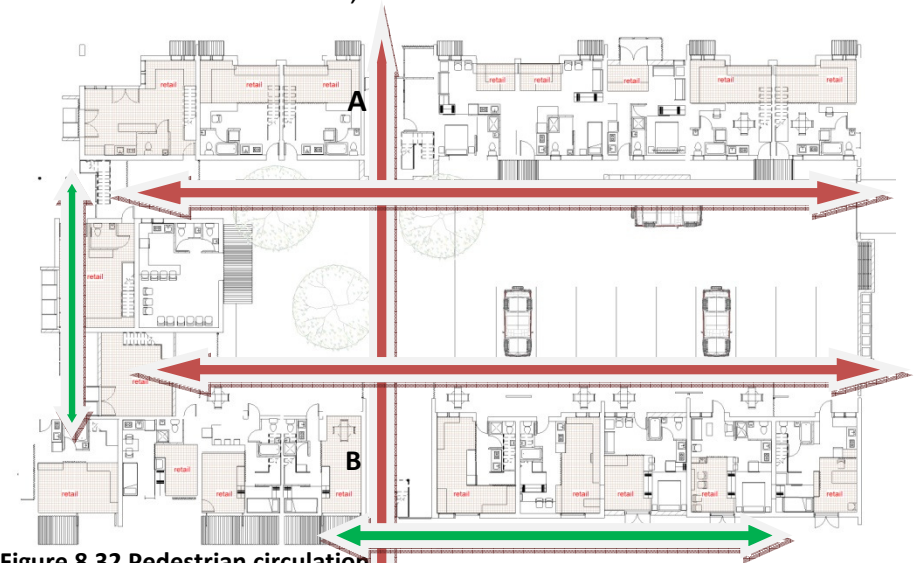
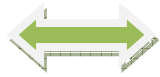


Figure 8.32 Pedestrian circulation

Interior circulation within courtyard space and interior walkways.



Exterior circulation on first and second floor levels with street interaction. Circulation from inside courtyard. No circulation access points from street, besides A and B.

A and B: Secured/gated pedestrian access.



Figure 8.33 Circulation on outside with street interaction

8.3.12 Green space and Landscaping

The provision of grassed areas between the blocks not only contributed to landscape, it has also created soft play areas for the children. Trees in the heavy-duty areas, such as the parking areas, are protected with metal rails. (Social Housing Foundation, Project Review Series : 2006)

Soft landscaping (fruit trees, shrub beds and lawn) is to be provided in the courtyard area. Hard landscaping to be provided in front of setbacks and retail edge.

Street trees are to be provided in accordance with City of Tshwane's street tree planting requirements.

8.3.13 Parking

Parking is kept to a minimum with less than one parking bay per unit. Limiting road markings and kerbs have reduced the visual impact of parking spaces. Parking is allocated to residents willing to pay for the parking bay, which is a fair method of allocation.

Hollow blocks are laid to encourage grass to grow through and this introduces additional greens to the project. (Social Housing Foundation, Project Review Series : 2006)

8.3.14 Garbage Services

Residents must take their household garbage to the collection points on the ground level storage spaces under the staircases. Appointed staff take garbage bins from storage place to garbage stand area from where appointed contractors then ensure that the bins are ready for municipal collection once a week (Social Housing Foundation, Project Review Series : 2006)

The garbage stand area is to be located in a position next to the vehicle access point in a position behind the boundary wall. The stand area is to be constructed of materials, which are in keeping with the character of the development. Garbage areas to be screened from public and semi-private courtyard spaces.

8.3.15 Laundry

Several drying areas are provided for. Certain units have access to drying areas on walkway level. These areas are secluded with timber slat panels to provide a visual sheltered area. Some units have access to communal rooftop drying areas. A flight of stairs leads up to a communal laundry area. Some apartments have access to a washing area and wash lines inside the courtyard.



Figure 8.34 Rooftop communal drying area

8.3.16 Social Amenities

The proposed facilities available to the residents include a children's play area, open public spaces and a resident's multi-functional room with kitchen facilities. The multi-functional room could be used for children day care, after school club for older children or multi social use.



Figure 8.35 Illustrating pedestrian route between HSC and Social Housing towards Hans Strijdom Road