3. RESEARCH METHODOLOGY

Several sets of data were studied to conceptualise relevant principles and patterns. The information obtained, were used to determine a possible design intervention.

- Interviews with several members of the community/public on the given site
- Existing housing practices and development in the area
- Precedent studies, local and global
- Spatial standards

3.1 Needs and perceptions of residents

Needs and perceptions of residents in the area were collected by means of unstructured and informal interviews on the site. Most of the people interviewed are self employed and could be categorised in the lower income group. Most strive towards their own home and would prefer a work/living environment.

From these interviews the following perceptions and needs regarding spatial standards and housing can be summarised:

1. There is a common perception under residents that new housing project appears to be very small and houses being overcrowded.
2. Residents still prefer mortar and brick houses, over more modern and lighter construction methods.
3. Many residents are self-employed and prefer a work, live and play housing environment. Units with retail/commercial opportunities seem to be very popular.
4. Internal kitchen, bathroom and WC's space seem to be very important.
5. The need to extend and add rooms to existing units, appear important, and generate rental income.
6. The need for security and safe environments are emphasized.
7. Services such as infrastructure, waste removal and public transport in the area should be upgraded.

8. Residents prefer living close to work opportunities and transport systems.
9. Units should have sufficient storage space.
10. The need for privacy is important. Residential units should be designed in such a way that the basic need for privacy is well planned.
11 Higher density developments appear to be acceptable. External communal spaces, courtyards and parks should be provided for.

Table 3.1 Compilation of needs and perceptions of residents

Housing Typologies

Figure 3.1 Image collage by author, 2008. Existing housing neighbouring the site, bonded housing, RDP housing and informal settlements.

Proposed baseline standards for SA Medium Density

SHIFT (South African Housing Forum Trust) suggests the following minimum internal dwelling area to be used as indicators for Social Rental Housing in South Africa:

Bachelor unit 30 **m² (gross dwelling area)**

1 Bedroom unit 37m²

2 Bedroom unit 45m²

3 Bedroom unit 52m²

THE PROPOSED BASELINE STANDARDS ARE:

1) The minimum floor area for the aggregate of the cooking, eating and living areas (CEL areas) is to be:

CEL AREAS (m²)

1- person apartment 22(m²)
2- person apartment 22
3- person apartment 24
4- person apartment 27
5- person apartment 30
6- person apartment 33
7- person apartment 36

NB: Cooking, eating and living (Kitchen / Dining / Living) areas exclude any utility area or space taken up on plan by staircases or hallways/corridors connecting these areas

2) The minimum floor area for bedrooms to be based on:
a) Aggregate bedroom areas to be no less than 7m² per single bedroom and 12m² per double/twin bedroom provided AND
b) Each bedroom to have a minimum internal floor area of 6.5m² for a 1-person bedroom, and 10m² for a 2-person bedroom.

NB1: in larger dwellings each bedroom does not have to be at least 7m² or 12m² floor area; the designer is free to distribute the total amount of space among the bedrooms as they see fit so long as the aggregate space equates to the minimum requirements stated AND the individual rooms meet the minimum requirement of 6.5m² and 10m² noted above.

NB2: ensuite bathrooms or shower rooms do NOT count towards this minimum.

NB3: the floor space taken up by built in wardrobes in bedrooms counts towards the bedroom floor area

- 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.

Table 3.2 The Greater London Authority proposes the following spatial standards for medium to high density housing projects in London: Greater London Authority (2006: 13)

- • 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 3.3 The Greater London Authority Spatial Standards for medium to high density housing projects in London: Greater London Authority (2006: 13), adapted to spatial standards for South African context

4.   THEORETICAL DISCOURSE

4.1   Housing in South African Context

Fig 4.1 Image by author. One stand, one house, Nellmapius 2008, illustrating poor urban principles

South Africa's National Housing Policy is being undertaken in terms of seven key strategies namely:

1.   Stabilising the housing environment.

2.   Mobilising housing credit.

3.   Providing subsidy assistance.

4.   Supporting the people's housing process.

5. Rationalising institutional capacity.

6. Facilitating speedy release and servicing of land.

7. Co-ordinating government investment in development.
   (South Africa's National Housing Policy, Part 1, 1997)

In terms of section 26 of the Constitution everyone has the right to have access to adequate housing (Section 26(1)). The state must take reasonable legislative and other measures, within its available resources, to achieve the progressive realisation of this right (Section 26(2)).

Section 2 of the Housing Act, 1997 (Act No. 107 of 1997) compels all three spheres of Government to give priority to the needs of the poor in respect of housing development (Section 2(1)(a)). In addition all three spheres of government must ensure that a housing development:

▪ Provides a wide choice of housing and tenure options as is reasonably possible;

▪ Is economically, fiscally, socially and financially affordable and sustainable;

▪ Is based on integrated development planning; and

▪ Is administered in a transparent, accountable and equitable manner, and upholds the practice of good governance (Section 2(1)(c)).

In short, the housing process seeks to fulfil the vision of a nation housed in sustainable human settlements with access to socio-economic infrastructure (www.housing.gov.za/content/legislation)

For quality to improve, housing policy needs to shift towards a demand driven mentality. The importance of such policy changes lies in the creation of sustainable environments, rather than a collection of houses in an instituted and prefabricated urban framework. Sustainable environments are those that serve the current social, economic and environmental requirements of its inhabitants as well as of future generations. (Macagnano, M: 2005)

In South African context, housing comprises designing with *cultural* and *social sensitivity* that exceeds the cause of provision of formal shelter, but instead serves to improve a current way of life. It

entails an environmental intervention that reflects a community, which adapts to its needs, instead of a community changing to fit into an environment. Therefore a home is created where interest is sustained and opportunity for future development is created – economic empowerment opportunity lives rife in a community where a sustained population is guaranteed (Macagnano, M: 2005).

Housing is not seen in isolation from the complex layers of urban society, but rather as an integral component to the totality of settlement. A key concern is that housing cannot be considered in isolation of other fundamental urban imperatives, including land, capital, financial resources, technology, transport, communication systems, people and energy (Mammon, N and Ewing K, 2005)

In low-income housing areas the primary spatial structure should consist of positive public spaces, green systems, transportation networks, community amenities, and human-scale local interventions for informal and formal economic and social activities, with potential for mixed-use opportunities. Core

gathering points and public spaces should form the social and economic heart of communities (Ewing, K: 2005)

The current backlog in terms of households without security of tenure is estimated at about 200 000, where the focus will be on upgrading informal settlements that have no formalised access to social and municipal services. The current backlog in terms of households without water and sanitation is estimated at about 300 000. Close to 50 000 new households are formed every year as a result of the combined effect of natural growth and urbanisation (Ewing, K: 2005)
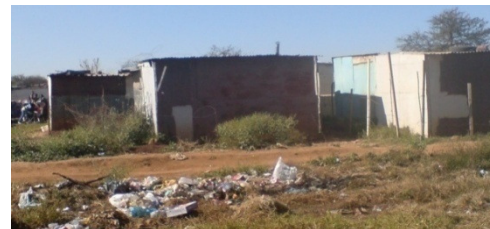
4.2   Housing – Breaking New Ground (BNG)

Figure 4.2 Residential Environment in SA context

Figure 4.3 Residential Environment SA contexts

Housing in South Africa, with reference to several current township developments, still bear the reminiscent legacy of a political ideology of apartheid where 'matchbox' type of houses were provided. The latter represents the policies of a historical, discriminating, political ideology of race separation and fragmentation in housing and urban spaces. This ideology led to mono-functional, uninspiring and bland living environments, inhibiting optimal human development and functioning.

According to Low (2005), till the mid-90's, housing in South Africa has promoted a 1 house, 1 site approach. The result of such an approach is the fragmentation and compartmentalization of a reductive design and delivery process with the loss of community and social cohesion. The current objectives of the South African Housing Department's policy document, *Breaking New Ground: a comprehensive plan for the development of sustainable human settlements*, are to facilitate a new approach to housing in South Africa. Housing should be based on creating human settlements where psychosocial and socio-spatial qualities of settlements are seen as fundamental to optimal housing.

The "Breaking New Ground" document highlights a number of ways to support this drive towards spatial restructuring, including the following:

- Progressive informal settlement eradication.
- Promoting densification and integration.
- Enhancing spatial planning.
- Enhancing the location of new housing projects.
- Supporting urban renewal and inner city regeneration.
- Developing social and economic infrastructure.
- Enhancing the housing product.
- Choice (www.housing.gov.za).

Low (2005) indicates that housing design should be a qualitative process, resulting in socio -economic transformation of urban environments. Housing design must provide an interface between economic utilitarianism and social expression. In contemporary urbanisation, the primary priorities of housing must be the consideration of the home as an economic entity, the mixed use of

tenure and function, urban infill and medium rise building projects with diversity and densification. When the home becomes an extension of the work place, economic and social advantages are leveraged for the poor communities.

According to Dewar and Uytenbogaardt (1991: 10), some 26 million people will live in South African cities by the turn of the century - an urban explosion to demand housing for millions migrating to cities.

4.3. Incremental Housing

The Incremental housing market is targeted at households earning less than R1 500 per month. The most important element of this programme is the harnessing of community based equity and energy. T he People's Housing Process has been initiated to assist people who are poor and homeless or inadequately housed (www.housing.gov.za)

The output will be the building of capacity of communities and local authorities to engage with People's Housing Processes. The emphasis is on the mobilisation of "sweat equity" in support of housing projects by ensuring that even the very poor and the unemployed also have an opportunity to be provided with adequate housing.

The idea behind this programme is to assist people living on serviced sites to build their own homes. This programme will be supported through public-private-community partnerships with building material suppliers and communities building themselves.

All programmes aimed at developing adequate housing over a period of time, at the rate and pace shaped largely by the affordability levels of the beneficiaries, have been clustered into one Incremental Housing Programme. This will focus on upgrading and servicing sites in informal settlements, whilst ensuring the provision of tenure security to thousands of people living in such settlements. This will be undertaken in collaboration with local government and will upgrade existing settlements and eradicate any new ones (www.housing.gov.za).

People-centred housing development has been widely acknowledged as a positive move in the creation of suitable environments for living, whereby communities actively participate in the provision of their own housing (Poulsen. L and Silverman, M : 2005).

4.4 Social Housing

> Social housing is defined as being higher density subsidised housing which is managed by independent social housing institutions.

Social housing could be defined as a housing option for low-to-medium income persons housing institutions provides that, and that excludes immediate individual ownership (Social Housing Foundation).

The Social Housing Foundation, SHF, was established by the NHFC in November 1997 as a Section 21 Company to promote, support and assist in the development of social housing in South Africa. The SHF provides training, advice, and technical support to established and emerging social housing institutions, advises on policy and raises funds for social housing developments.

The Government has acknowledged that the development of acceptable and sustainable medium density rental housing can only be realised through sustainable social housing institutions and adequate private sector involvement. Social housing has shown to be able to significantly address concerns around urban regeneration and improve housing densities. It clearly contributes to sustainable development, especially when location, integration, viability and sustainability are carefully considered.

In the context of this policy, a housing institution is defined as a legal entity established with the primary objective of developing and/or managing housing stock that has been funded through the grant programmes specified in this policy. The housing institution can own the housing stock, or it can be owned collectively by a grouping of residents.

The Social Housing Programme is primarily aimed at beneficiaries earning between R1500 to R3500 per month.

Social housing is not an option for the very poor. By its very nature, persons accessing accommodation from housing institutions will have to earn a secure income, formally or informally, to be able to afford the rental or other periodic payment for accommodation. Furthermore, social housing cannot be limited to specific income groups if the broader integration, regeneration and market demand objectives are to be realised. The housing option therefore should promote a mix of income groupings covering both low income and medium income persons, as prescribed in the regulations for social housing from time to time (Social Housing Foundation)

Social housing primarily covers the rental tenure option and excludes immediate individual ownership by the residents. The social housing option is not intended to be used by beneficiaries seeking immediate individual ownership, as other options have been created within the Housing Subsidy Scheme to accommodate such needs. The social housing option, however, does allow for collective forms of ownership, on condition that the persons involved and being housed through collective ownership are fully aware, understand and subscribe to these forms of collective ownership options. The conversion of these rental schemes into ownership options is not excluded. Such conversions, however, will only become viable options in the long term, and will be based on feasibility studies confirming the sustainability of such a conversion scheme and that of the SHI concerned. Under normal circumstances the conversion of rental schemes to sale options should not be considered within the first 10 to 15 years (Social Housing Policy for South Africa, Draft document, July, 2003). (www.housing.gov.za/content/legislation_policies)

4.5   Co-Operative Housing

A housing co-operative is an association of people who collectively own and govern their housing on a not-for-profit basis. Co-operative principles accord closely with the idea of 'UBUNTU', well established in South Africa.

By working together, members of a co-operative can provide themselves with better and more affordable housing than they could as individuals. Within the housing sector, co-operative housing meets the particular need of people wishing to build a community, have a say over how their housing is managed and promote a culture of democracy. A housing co-operative differs from other forms of tenure in that residents share responsibility, ownership and governance of their homes (www.housing.gov.za).

4.6   Housing Support Centre (HSC)

Of those who need housing, 68.7% earn less than R1500 per month and would rely on support in the form of subsidies and financial assistance, technical advice, technical support, and general housing support.

According to Pecar, M (2005), housing or the dwelling experience is a complicated process and comprises more than providing shelter. The housing process should address the potential dweller in its totality and should be an interactive process with choices, options and participation. Pecar further indicated several behavioural elements that could influence the housing process and should be addressed by housing research:

- How do people go about finding and making their home?
- What do people look for in order to commit to a particular place and what help do they need from society?
- Can the design profession (HSC) offer support and solutions to the dwelling needs of the contemporary individual homeowner?
- What can one individual (HSC) offer to improve the housing condition of individuals and communities?

Since 1994, approximately 1.5mil-subsidized houses have been built in South Africa at a cost of about R24 billion. Most of these houses were delivered by the South African Government through project-linked subsidies and became known as RDP houses. This mode of delivery was shifted towards the People's Housing Process (PHP) with its launch in 1998. Beneficiaries were encouraged to participate in this delivery process and have been obliged to

contribute a sum of R2479. Houses have become known as '2479s' (Poulson L. and Silverman M: 2005)

The PHP comprises of community participation and initiative in the housing process, beneficiary involvement with households receiving subsidies, local job creation and skill development. The PHP ensures access to housing subsidies for those earning below R1 500 p.m. with the option to enhance their subsidy by building their homes themselves.

Taking in consideration the current urban environment of Mamelodi East, being an area with a fast growing residential population, the potential of a Housing Support Centre (HSC), could be substantial in the process of transforming the urban fabric of this node. The latter concept to enhance resident participation and involvement in decision making on certain housing processes, providing assistance, training and education

A Housing Support Centre, a joint venture between the University of Pretoria, Housing Department and a Social Housing Institution,

could facilitate and support the entire housing process on several levels:

1. Facilitate the Formal Housing, Social Rental Housing, Co-operative Housing and Peoples Housing Process by means of access to information and financial, institutional, technical and logistical support.
2. Training in the form of hard and soft skill training programmes with housing workshops and skills transfer.
3. Technical support in the form of hard skill training, building material advice and equipment and material display for the PHP.
4. Housing support on outreach and community level.
5. Building material provision.
6. Academic housing research (sustainability, urban planning, environmental studies etc).

Ongoing research should be a fundamental component of the housing process. The HSC, linked to the UP Mamelodi as academic institution, should address these housing topics in order to ensure human sustainable housing environments in South Africa.

4.7 Housing – An Urban Regeneration Strategy for the Mamelodi Campus

Housing could be seen as the driving force behind a regeneration strategy on the campus. Many authors argue that housing be a generating factor in the process of transforming urban environments.

According to Mammon (2005), housing is not seen in isolation from the complex layers of urban society, but as integral component of urban society. In the context of the Mamelodi campus, housing plays a fundamental role in regenerating the urban potential of the urban environment.

Housing could be seen as a design instrument in transformation and regeneration of urban environments and has become the leading form-determining element in twentieth century urban development. According to Dewar and Uytenbogaardt (1991: 56), currently community institutions are embedded in housing areas, as opposed to housing infilling between.

Housing delivery needs to be combined with mechanisms for community upliftment, job creation, capacity building, empowerment and public utilities. Housing delivery mechanisms will ultimately influence the spatial and physical characteristics of the resultant environment. Housing has the potential to glue and bind an urban environment together. In the context of the Mamelodi campus, housing could be the binding force between the campus and the urban residential environment. (Osman and Lemmer, 2005).

Keeping in mind the research by Boyden (1971) a comprehensive housing strategy should address all psychosocial and wellbeing needs in order to create a healthy and sensual rich urban environment. Housing should be seen in the context of a human settlement, addressing the needs of residents in all spheres of life.

Several international housing researches agree that housing, as the central locus of everyday life patterns, is likely to be a crucial component in the way in which socio-economic factors shape mental health of a population. According to Dunn (2002: 2) a

definite correlation exists between housing as a socio-economic determinant of population health. Lynch and Kaplan (1997) also suggest the importance of housing and urban environments as a nexus or medium through which a wide range of health determinants may operate.

According to Osman and Hindes (1998: 22), one should move away from the sterile, regimented and inefficient settlement patterns that dominated housing delivery in the past.

Dewar and Uytenbogaardt (1991: 15-16) argue that human settlements should meet certain *performance criteria,* in order to accommodate the activities of urban life. The ***Need, Programme*** and ***Idea*** of any urban environment, should be explored on order to develop a cohesive approach to urban design.

Need:
- To turn South African cities into efficient economic machines.
- All urban inhabitants should enjoy easy and equitable access to urban opportunities and movement on foot should define the primary scale of urban development.

- Promotion of social contact and interaction
- Individual needs, which includes physical needs, psychological needs and sensory needs (Inclusive design/environment).

Programme: (Qualities which contribute to the satisfaction of the need):
- Balance between society and cosmos
- Balance between society and nature
- Balance between people
- Promote the maximum positive freedom.
- Urban environments, which are equitable.
- Intensity, diversity and complexity
- Integration
- Creating a sense of belonging and identity

Idea: (This is concerned with the nature of plan and the structural relationship which should be pursued):
- Positive environments should release individual creativity, ingenuity and resources as well as the freedom to find expression.

- Freedom only exists when there is choice and choice is only available when there is constraint. The residential open building principle where occupants are allowed a level of participation and choice in the layout and finish of their units, might contribute to individual creativity and pride.

- Plans should create opportunities to which people can respond and it needs to widely accept "corporate urban culture"

- Plans should provide for small scale building processes so that the urban poor can participate in the system.

- Plans should contain three generic types of actions, which is holding actions, structural actions and controlling actions. Holding actions are decisions, which are made to reserve options for future generations. Structural actions create opportunities for people and controlling actions reduce freedom of decision-making. (Support and infill)

- Access to opportunity

- Liveability

- Identity

- Community and public life

- Authentic and meaning

- Social justice

- Self-reliance

- To create an environment conductive to the continuous flow of harmonious flow experience. (Dewar and Uytenbogaardt, 1991: 15-16).

Lewis (2005: 38) indicates that fundamental to housing design, is the physical form of the urban environment as central aspect of the social world itself. Spatial solutions affect social action by setting constraints, providing opportunities and fostering activities. Social values and processes, as well as the physical form of housing projects are mutually inclusive dimensions of housing provision. Social values such as sustainability (an overriding social value influenced by the provision of choice, safety and sense of neighbourliness) community and safety indicate the relationships between buildings and spaces. The social issue of safety is one that predominates over others in many social contexts.

Successful urban regeneration, in South African (developing countries) context, pivots on the need to generate opportunities for small-scale, self-generated economic activity. Part of regenerating neighbourhoods, is allowing people sufficient freedom to find opportunities to express their own ingenuity and creativity and turning cities into economic machines (Dewar and Uytenbogaardt 1991: 16)

In the context of housing and regeneration of cities, all the above-mentioned authors agree that housing be a design tool in urban transformation and social change. Besides providing shelter, housing could be used to give scale, definition, create socio-spatial change and be a catalyst of empowering people (Hamdi, 2008). Housing could be the core of upgrading and regenerating of the urban environment; making the environment safer and more pleasant.

4.8   Campuses and Street Interface

Figure 4-4 and 4-5 Image collage author, 2008. Mamelodi campus

Nicks (2003: 179-205) argues that urban design, and specific designing the interface, could be a valid tool in reconstructing apartheid villages, towns and cities. He highlights the opinion the urban qualities could play a mediating role in regenerating cities. Urban design is not confined to the physical and spatial, but embraces the social, economic, symbolic and spiritual as well. The single-minded implementation of nearly 40 years of apartheid, exaggerated the physical separation of urban activities. Social and economic activities are segregated on the basis of race and class. The latter to result in fragmented and disjointed urban environments.

An important urban consideration when designing within settlements is the design of   edges between different urban activities and the integration of functions and spaces that can accommodate mixed uses, with multi-functional spaces and gradual selective infill. The interface being that area in which buildings relate to other buildings and where they relate to the street. (Righini, 2000: 285)   The relation of the building to the street

frontage should be seen as the key to the success of the proposed design. The mixed-use strips are buildings, which create a habitable wall with different functions accommodated on the different levels, each interacting differently with the street (Osman and Hindes, 2005: 59)

Hans Strjidom Avenue, being the street on the eastern edge of the campus, should be treated as a social space with rich qualities and be incorporated within the urban regeneration strategy for the campus. The Hans Strjidom and Hinterland intersection should be recognised for its social qualities as venue for human contact and events, a central place of identity and a change of direction for streets. Architectural and urban spaces surrounding the campus could be treated as containers to accommodate, separate, structure and organize, facilitate and celebrate human spatial behaviour. Louis Kahn indicated in 1960 that it's time for the street to be a subject of conscious design, or to treat the street as if a building. A more positive function of capital design is to make the streets into channels of symbolic intelligence. (Crane 1960: 288)

According to Appleyard (1983: 116-117) streets are guidebooks to the city; they tell visitors and commuters where things are and what the city is about. They are the most visible places in town. Streets could serve as places of sanctuary, places where communal life is possible, territory that residents feel belong to them, places for play and learning, a green and pleasant land and a liveable environment to which traffic should conform. Characteristics of positive environments are intensity and diversity of activity.

The Hans Strjidom corridor should be seen as a life-sustaining system and not a movement route. Movement along this corridor will be slower, reducing the amount of aggregate movement. Accessibility should be maximized and mobility reduced.

4.9 Housing without Houses – Architecture and Design Psychology

Design psychology is the use of psychological principles as the fundamental principle for design decisions in architecture.

Architecture is inseparable from its social purpose and from its environmental setting.

Dunn (2002: 4) indicates that housing serves an important role as place of refuge in society. Home is one of the few places in everyday life where a person is socially and legally sanctioned to exercise complete control. A home is also as important source of prestige, status, pride and identity and is a crucial setting for social interaction and the centre of individuals' social networks. A home should be a place of continuity, stability and permanence in everyday life

Propow (2000) indicates that the human body is biologically predisposed to recognizing design and structure either consciously or unconsciously and that a variety of criteria may be at work influencing us when we find ourselves living, working or playing within the urban environment.

According to Propow (2000), Gestalt psychology seems to be central to how we experience architecture. Our brains are wired to infer the rhythm and patterns of architecture that in turn yield a behavioural effect. Architecture a symbolic and intentional endeavour seems to reflect the psychology of its designers regardless of time, culture and perhaps even spaces.

Poor human settlement qualities with lack of proper urban design initiatives, result in poor spatial qualities and could be seen as a case study of housing policies based on the provision of houses only with no respect to human qualities and psychosocial values. The latter will result in a characterless neighbourhood with poor socio spatial qualities. Alexander (1977: 393) indicates that the latter would work against the natural processes, which allow people to form stable, self-healing communities.

Marcus (2007: 10) is of opinion that the houses people live in; say much about their lifestyle, development and dreams. How people built their houses indicate much about their needs and desires. According to him design cannot cause behaviour, but it can offer the possibility of certain behaviour-taking place. The physical environment of the housing developments, can encourage,

discourage or be neutral to its resident's behaviour. The environment can thus facilitate certain behaviour simultaneously via certain modes of physical, social and symbolic communication. We avoid settings that have no meaning for us or where we feel confused, fearful or under stress. In a housing context, people would use spaces and settings that have a functional use or aesthetic attraction and avoid those that do not. Environments with high psychosocial value are designed around basic human needs, ancient preferences, and connections to the patterns of nature and the mind.

The South African housing environment requires a new approach in housing and spatial planning. Housing should address man within the context of his psychosocial needs. As Marcus (2007 : 10) stated, built structures affect our psyche as well as our bodies. They can be inspiring and supportive of daily activities, or they can deplete the spirits and undermine the best intentions of the designer. Positively experienced, psychologically healthy buildings and environments have a host of features that distinguish them from less enjoyable buildings. Environments with high psychosocial value are designed around basic human needs, ancient preferences, and connections to the patterns of nature and the mind.

According to Macagnano (2005), the provision of housing is more than just the provision of shelter but also that of a lifestyle. These homes represent a stable future for a family or individual around which a new life may evolve and thus need to be able to cater for every occurring opportunity for improvement. In doing so a world of possibility is opened to those concerned rather than one of complacency and limitations. The forging of personalised and well structured homes and environments result not only in a lifestyle based on freedom of choice, but also the establishment of a personal economic investment in one's home, granting certain economic empowerment in the long term.

According to Fisher et al. (1984: 67), if the environment offers little or no stimulation, environmental-behaviour problems are called into existence. We usually prefer an optimum level of stimulation, which is a combination of sensory stimulation, social stimulation and movement. The experience of under stimulation of the

resident of this area could lead to social deprivation, behavioural decompensation and environmental degradation. Social constraints could be related to behavioural disorders, social deterioration and poor mental health of communities.

Lewis (2005: 42) and Dewar (1991) are of opinion that social values can be realised through a series of socio-spatial qualities. Socio-spatial qualities of permeability, legibility, adaptability, energy efficiency, variety, activity and privacy; all contributing to a optimum healthy environment. Positive environments can be achieved regardless of the quality of the individual building and emphasises the environmental, social and economic benefits of high densities.

4.10 Towards a Healthy Environment

Environmental psychology studies the interrelationship between the built environment and the human psyche. According to environmentalists, the environment people move around in, influence their behaviour and feelings. A definite interrelationship exists between the built environment and human behaviour.

Environment could influence and constrain behaviour, but can also provide optimal conditions for personal growth and actualizing(Marcus 2007 : 10).

The Psychology of Architecture studies how architectural styles reflect the needs and preferences of people and how different designs mould and shape behaviour. A proper investigation of cultural, social and personal needs of potential urban dwellers should be considered before an acceptable urban planning and spatial design can be made.

Norberg-Schulz (1980: 85) mentions that, when man dwells, he is simultaneously located in space and exposed to a certain environmental character. The two psychological functions involved may be called **orientation and identification.** These two functions relate to man's safety, welfare, and friendly man-place relationship. It is at the presence of these aspects that man can function to the optimum level in the urban environment. The structure of a building has a direct impact on the social consciousness of the viewer, where the appearance and the function of a specific

building create a sense of purpose within those who live and work within and around it. The correlation between people and place means that architecture is thus inseparable from the social purpose of the building, not its environmental setting.

Biologist Stephen Boyden (1971) defines the optimum healthy environment as "the conditions, which tend to promote or permit optimal physiological, mental, and social performance in a natural environment." Boyden argues that environments need to fully satisfy both "survival needs" and "well-being needs." Survival needs deal with aspects of the environment that directly affect human health, such as clean air and water, lack of pathogens or toxins, and opportunity for rest and sleep. Well-being needs, on the other hand, are associated with fulfilment, quality of life, and psychological health. Failure to satisfy survival needs may lead to serious illness or death and failure to meet the well being needs that can lead to psychosocial maladjustment and stress-related illnesses. Environmental psychologists have also considered other needs such as comfort maintenance and sense of equity, which are important in today's building environments.

Boyden (1971) identifies well being needs that should be addressed in spatial and urban design:

- Opportunity for relaxation and psychological restoration.
- Opportunity for privacy and for movement between interaction and solitude, as desired.
- Opportunity for learning and information sharing.
- Opportunity for connection to the natural environment.
- Opportunity for regular exercise.
- Sound levels not much above or below that of nature.
- Meaningful change and sensory variability.
- An interesting visual environment with aesthetic integrity.
- Ability to maintain and control personal comfort.
- Making sense of the environment.

According to Kendall (2003: 8), participation and adaptation could be an asset of new urbanism and contribute to residents' *sense of place* experience. The residential community; they express stronger attachment to their community and sense of identity with open building principle allows for participation, shared responsibility and distributed control. Kendall shares the opinion that giving residents participation and option for personal input in their homes, lead to

greater responsibility and ownership of their units. The latter will, therefore, contribute to better social interaction and socio spatial qualities. Within a residential open building project, residents perceive substantially greater sense of adaptability and expansion. Change and growth over time requires flexibility in design to provide for a number of accommodation alternatives. Balance and equity refer to finding the mean between excess and insufficiency and ensuring equitable access to resources and opportunities out at the occupants' discretion.

Housing today should be a merger between the peoples' needs, desires, design and the delivery process. The overarching principle in low-income housing today should be the creation of the compact city and the need to see housing as an instrument to spatial restructuring by creating sustainable human settlements. Housing should help to form a positive spatial structure in relation to the public spaces and internal residential courts that it creates. The diversity of form and density of the housing units could be expanding around internal courts and activity nodes.

The idea of the Compact City is fundamental to mitigate the problems of inefficiency and fragmentation. A Compact City includes a socially just city where justice, food, shelter, education and health are distributed fairly. Integrated compact cities, where access and proximity to essentials are at reach on foot, and a diverse democratic city where diverse interests, culture and activities come together. (Mammon, N and Ewing K, 2005)

Change and growth over time requires flexibility in design to provide for a number of accommodation alternatives. Balance and equity refer to finding the mean between excess and insufficiency and ensuring equitable access to resources and opportunities.
In low-income housing areas the primary spatial structure should consist of positive public spaces, green systems, transportation networks, community amenities, and human-scale local interventions for informal and formal economic and social activities, with potential for mixed-use opportunities. Core gathering points and public spaces should form the social and economic heart of communities (Ewing, K: 2005)

4.11   Courtyard Housing

The design possibilities of courtyard housing will result in various socio spatial qualities. Courtyards provide sociable spaces with a spatial system and inherent social logic to it. The latter must be seen as a generator of contact between people. Rapoport (2007: 57-65) argues that the nature of courtyard housing, contributes to sustainable design principles and urban qualities. Climatic control, socio-spatial qualities, vernacular and cultural tradition led to maintain the courtyard design for centuries.

Limited urban space and quests for higher urban density, led to recent attempts to re-introduce courtyard houses in areas where the tradition of freestanding houses has prevailed. The ability of courtyard housing to create a higher density fabric is often seen as one of the major advantages of courtyard design. Courtyard design could be defined as *the inside out city*, replacing outward facing individual house on a stand. Houses relate to a courtyard or semi-private space and not to the street. With courtyard design, the private domain of the individual unit can be linked to the public domain of the courtyard space. The building being part of a permeable boundary will serve as barrier in the hierarchy of spaces.

The use of the courtyard form in residential design, should mediate between public and private spaces. This gives residents the opportunity to choose between activity and privacy. The extent to which buildings make the distinction between public and private space, will depend on required levels of security and penetration into the blocks and buildings. The boundaries between public and private spaces are easy to manage with perimeter blocks, which can have varying levels of enclosure. Some housing units only require the suggestion of enclosure, with gaps between the buildings where access is managed by natural surveillance. In other blocks that require more security or privacy, the building form can be a solid and continuous barrier between inside and outside or public and private space (Lewis, 2005: 57)