

**UNIVERSAL DESIGN FOR LOW-COST HOUSING IN SOUTH AFRICA:
AN EXPLORATORY STUDY OF EMERGING SOCIO-TECHNICAL ISSUES**

by

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DECLARATION

I, Colette Ghislaine Claudine Fransolet, declare that the contents of this thesis represent my own unaided work, and that the thesis has not previously been submitted for academic examination towards any qualification. Furthermore, it represents my own opinions and not necessarily those of the Cape Peninsula University of Technology.



Signed



Date

ABSTRACT

Low-cost housing is always an important / a weighty topic for discussion in South Africa and the construction or occupation of such houses often makes media headlines. The media usually raises the negative aspects of such housing, for instance, the fact that these houses are sometimes poorly constructed, or that the administration systems for allocating such houses to their new owners are often faulty, or that physical access to them is limited, particularly for people with disabilities, and that social interactions among the inhabitants of these houses is often problematic. It therefore appears that the 'design for all' – or 'Universal Design' – approach has not been considered during the design phases of these developments. Although Universal Design is not a new concept, the South African National Building Regulations has a section specially for creating physical access, but it is not widely practiced or implemented in South Africa, let alone with the local housing sector. There is general lack of awareness, technical know-how for the implementation and a lack of enforceable penalties for non-compliance with this specific section of the Building Regulations (SANS 10400 Part S of 2011).

This study aims to investigate some of the socio-technical issues that have arisen in the low-cost housing sector, by specifically focusing on informal settlements in Cape Town, South Africa. During the period of apartheid, pre-1994, population groups in South Africa were segregated into separate residential areas; the aftermath of this is still prevalent, as is the continued exclusion of marginalized groups within the low-cost housing sector.

Data was collected through interviews with various people within the professional sector including Architects, experts in Universal Design and people from organisations that specialise in the planning/design/construction of low-cost Housing in Cape Town, focusing on the lack of a more community orientated design approach that utilises the principles of Universal Design as well as Universal Access building audits. Such audits were conducted on houses and communities that were constructed prior to 2004, on houses and communities that were designed and constructed after the passing of the Breaking New Ground (BNG) policy (2010), as well as on proposed new housing designs that were being considered for the future construction. The audits looked at general circulation spaces, community involvement, sustainability and means of construction. On the basis of these highlighted elements, in conjunction with the tender requirements of low-cost housing, and the findings of the interviews, and through the

lens of Universal Design and international and local best practice, a set of recommendations was formulated in the form of requirements.

The study thus developed a set of practical guidelines to be considered when designing and constructing low-cost housing developments. Ideally, these guidelines would inform and determine the granting of tenders for the construction of low-cost housing developments in informal settlements.

With the application of Universal Design thinking (through participatory design), future low-cost housing developments in South Africa could accommodate previously marginalized people without necessitating expensive structural changes. The integration of all the members of an existing community within housing developments is essential in forming cohesive and responsible communities and societies.

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GLOSSARY

- Accessible:* In the context of this research, access and accessibility are mainly defined as the ease and user-friendliness with which facilities, such as houses, are used.
- ADA:* The Americans with Disabilities Act of 1990 (Public Law 101-336 passed on 26 July 1990)
- Backyarders:* People who occupy informal living spaces that have been built onto formal building structures, which mostly located in the backyards of formal housing.
- Barrier-Free Design:* Design that seeks to eliminate physical barriers to people with disabilities; often used synonymously with physical "accessibility" in built environments (M'Rithaa, 2009: 16).
- Disability:* "Is an umbrella term for impairments, activity limitations and participation restrictions. It denotes the negative aspects of the interaction between an individual (with a health condition) and that individual's contextual factors (environmental and personal factors)" (World Health Organisation, 2013:5).
- Elderly:* Members of the general population aged 65 and older, usually assumed to be dependants. Also referred to respectfully as Senior Citizens (M'Rithaa, 2009: 17).
- Functioning:* "Is an umbrella term for body functions, body structures, activities and participation. It denotes the positive aspects of the interaction between an individual (with a health condition) and that individual's contextual factors (environmental and personal factors)" (World Health Organisation, 2013:5).
- ICF:* "The International Classification of Functioning, Disability and Health (ICF)" (World Health Organisation, 2013: 3).
- Impairment:* "Problems in body function and structure, such as significant deviation or loss" (World Health Organisations, 2013:5).
- Inclusive Design:* The design of mainstream products and/or services that

are accessible to, and usable by, as many people as reasonably possible on a global basis, in a wide variety of situations and to the greatest extent possible without the need for special adaptation or specialised design; sometimes used as a synonym for Universal Design (M'Rithaa, 2009: 18).

Life Span Housing: The concept of designing a living space to accommodate all users, from childhood to being elderly, and all the diversity that occurs throughout the entire life span.

Participation: The freedom of taking part in any socially acceptable and desirable activity, thus promoting (within the participant) a sense of belonging and ownership (M'Rithaa, 2009: 19).

Participatory Design: Associated with Co-design and is based on the practice of involving users from the beginning of the design process to best accommodate all their needs and desires.

RDP: Reconstruction and Development Programme, the programme was established by the democratic government in 1994 (South Africa, 1994).

Shack: Informal dwelling type made from materials found in the surroundings.

Spatial: The general area that is inhabited by people, concerning both indoors, surrounding infrastructure and outdoors.

Ubuntu: "A traditional African ideal that finds expression through mutually reaffirming communal interaction, mutual support, group solidarity and humanness." (M'Rithaa, 2009: 21)

Universal Access: "The diversity of our species reinforces the need for Universal Design and Universal Access. Designers traditionally have been trained to design for the mythical average person. It is possible to design products and systems to suit a broader range of users: children, older adults, persons with disabilities, people of differing size or shape, people who are ill or injured and people who are inconvenienced by circumstance." (IDC Consultants, 2012)

Universal Design: "Universal design means that the products which designers design are universally accommodating, that they cater conveniently for all their users." (Goldsmith, 2000: 1)

LIST OF ACRONYMS

ADA	Americans with Disabilities Act
ANC	African National Congress
BNG	Breaking New Ground
BRT	Bus Rapid Transit
DAG	Development Action Group
FPDA	Freedom Park Development Association
HDA	Housing Development Agency
ICF	International Classification of Function, Health and Disability
MDGs	Millennium Development Goals
OIs	Opportunistic Infections
PD	Participatory Design
PEPUDA	Promotion of Equality and Prevention of Unfair Discrimination Act
PHP	People's Housing Process
RDP	Reconstruction and Development Programme
UD	Universal Design
VPUU	Violence Prevention through Urban Upgrading
WHO	World Health Organisation

CHAPTER ONE

INTRODUCTION TO THE STUDY

1.1 Introduction

In South Africa, the impact of years of apartheid and segregation remain clearly visible in the urban landscape, serving as a reminder of the past and an encouragement to design for change – for a change in mindset and a change in policy, and hopefully, a change for the better (Gilbert & Koblitz, 2011:5).

South Africans have come a long way in terms of encouraging inclusiveness and equality since the inception of our democracy a mere 21 years ago. Progress has been made in policy and legislation, but implementation has fallen short: there has not been sufficient follow-through, as it was envisaged and hoped for, which would have resulted in a greater focus on human-centered design (Mammon et al., 2008:5-27; Thematic Committee, 2001: 2).

The outskirts of Cape Town are lined with an overwhelming number of informal settlements. Frequent service delivery protests frequently make news headlines and the development of low-cost housing is often a point of discussion, not only in the political realm but also among local citizens. The delivery of houses to the country's poorest citizens appears to be constantly delayed due to cost, corruption or bad workmanship; in short, the annual construction of low-cost houses is not meeting the annual growth in demand for such houses. Besides the lack in the quantity and quality of houses built on a large scale, there is also a lack of social integration and a sense of community within these densely constructed areas (Gilbert & Koblitz, 2011:5).



Figure 1.1: Aerial view of Langa Township just off the N2 Highway, approximately 12km from the city centre of Cape Town. Most of Langa Township consists of shack homes, which have been laid out in an unstructured manner, as people relocated from the city. Image from: Google Earth, Langa Township, Cape Town, South Africa.



Figure 1.2: Aerial view of New Rest settlement just off the N2 highway, approximately 20km from the city centre of Cape Town. New Rest is an example of the mass construction of low-cost housing, where little attention appears to have been paid to the design of the area and the importance of creating communities. Image from: Google Earth, New Rest Settlement, Cape Town, South Africa.

Although we live in a dynamic world that is constantly changing in terms of fashion, technology and culture, there are certain social aspects that are essential to living in a community, and which enhance interaction, safety and security, as well as encourage respect and dignity for others and oneself (Gilbert & Koblitz, 2011:5). This research aims to highlight the impact of a lack of design, in terms of creating (and re-creating) a sense of community among those who were uprooted from their homes and relocated to other areas (according to their racial classification), as well as to make some suggestions to remedy the situation for future housing developments. Universal Design (UD) in the context of this research is defined as design that accommodates all people, irrespective of differences in ability, age, gender, language, culture or race.

The physical construction requirements, as defined by legislation, and the social aspects of these housing developments and their layout are brought together in the articulation of socio-technical requirements within the context of this research. This has led to the topic for the research, which is summarized as follows:

Universal Design for low-cost housing in South Africa:
An exploratory study of the emerging socio-technical issues.

Through desktop research on policies and legislation as well as international developments in the housing sector, the researcher gained an overall perspective of the current situation, both internationally and locally. In order to derive more in-depth information, the researcher identified two research groups to ascertain the reasons for the current housing situation, at a micro level. The two groups consist of residents of the housing developments, as well as

professionals who are knowledgeable about current housing developments. The interviews with the residents were unstructured and discussions were generally around how they went about receiving their houses and the general workings of the community. The interviews with the professionals, in areas of design, construction, sustainability or UD, were more structured and according to several guidelines.

As a result of the findings of this research, a set of recommendations was formulated, in a three-tier system, with a structured hierarchy in order of area of application, in order to better inform the design and construction of future low-cost housing developments and to encourage a greater sense of community and social integration. The three tiers were the Home, Precinct and the Community. See Chapter Four for further information.

1.2 Motivation for Choosing this Topic

Practitioners of Universal Design (UD) aim to design services, buildings, products and environments in a way that allows all people equal opportunity and equal access, irrespective of their race, gender, physical ability, age, language, etc. South Africa is a culturally rich and diverse country and the developments and changes that are happening in our young democracy need to reflect our constitutional obligations, of creating equal opportunities for all people. By applying the dynamic and multi-directional design thinking processes, as indicated in Figure 1.3 below, to ideas concerning housing (for example, by employing the lens of UD), the results will be based on the inclusivity of diversity. Design thinking and UD are therefore inherently linked in the concept of 'UD thinking'; this research is only one example of the various areas in which this could be applied.

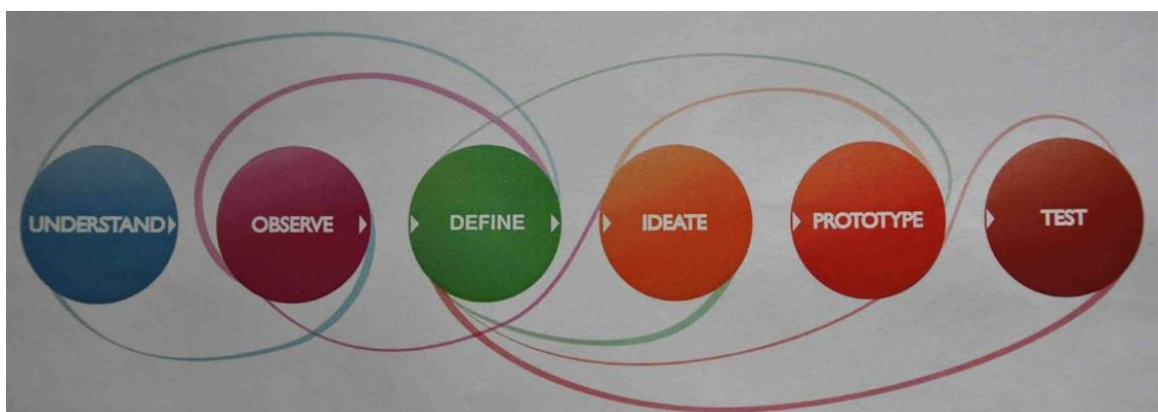


Figure 1.3: Processes of design thinking, which, when applied through the lens of Universal Design, easily become Universal Design thinking. Image from: India Design Council, 2014.

1.3 Contextualising the Housing Imperative

In the South African context, the housing backlog has been increasing annually. In the Western Cape, for instance, the housing backlog was at 400 000 people in 2009 (SAPA, 2009), which grew to 470 000 people by the end of the following year (Davids, 2010). This has led to land sprawl, with local people bearing the brunt of housing developments that are set up purely in an attempt to meet housing demands. In this context, it is essential to use UD to aid in meeting the basic needs of people and to fulfil the mandate of our country's constitution in a humane and socially sensitive manner.

Since the inception of the Reconstruction and Development Programme (RDP) (1994) and subsequently the Breaking New Ground (BNG) policy (2004), construction technology and UD have made great advances to benefit this industry, but it appears not to be making an impression on the local housing sector. New construction methods and thought processes are being applied globally, with various benefits including cost, time, and quality of housing, as well as social and economic benefits. This study is thus based on low-cost housing in Cape Town, South Africa, with the aim of reviewing existing housing interventions and defining user needs for a more socially responsible and integrated community.

However, many components must be factored in when considering any change to the current housing situation, and the issue could be described as a 'wicked problem', to quote Rittel and Webber (1973: 156-160). They describe a 'wicked problem' as a situation within a social context that does not have a definitive problem description or definition. So-called 'wicked problems' moreover have no outright or simple solution, and are not able to be isolated, as they are part of an intricate social matrix (Ibid). Several interrelated areas have been identified as influencing the design as well as the delivery of low-cost houses in South Africa, collectively forming the 'wicked problem' of social housing. Some of the areas have been identified below:

- Politics: Housing can be politically driven, for instance, to gain votes by pointing out the errors of parties who are or were previously in control of a certain metropolitan area, and promising to deliver on the housing backlog or to deliver better quality housing.
- Participatory Design: Community involvement is essential in order create a more coherent society within low-cost housing developments, which starting to happen more frequently within the current housing developments.
- Construction: The construction of houses also relates to who is responsible for constructing the houses, which includes the overseeing local Municipality who

specified the requirements of the housing development, to the contractors who are responsible for the construction of the houses.

- **Land Availability:** Housing cannot be built if there is no land available. The availability of land refers to either open, vacant land or to areas, where there are currently unused buildings or land.
- **Time:** This refers to the length of time needed to construct a house, which in turn determines the length of time people on the waiting lists must wait to receive a house, as well as how long it will take to meet the housing backlog.
- **Quality:** Previously the quality of the low-cost housing has been sub-standard, which is detrimental to meeting the housing backlogs.
- **Services:** The provision of services such as water and electricity is vital to creating a living community.
- **Sustainability:** As both the population and the housing backlog are growing, housing developments need to be sustainable, mainly within the context of ecological preservation as well as economic opportunities to increase the viability of the communities.
- **Demand:** The demand for low-cost housing is increasing, and increasing numbers of people are placed on the waiting lists.
- **Universal Design:** This refers to the principle of accommodating all types of people in housing developments, including children, the elderly, and people with various physical, mental, emotional or functional limitations.
- **Access:** Within this context it refers to waiting lists and backlogs which affect the rate at which people have access to their houses.
- **Cost:** As social housing is generally subsidised by government, the cost thereof determines the number of houses that can be delivered per annum, due to the budgets allocated thereto.

All of the above areas are interlinked and overlap, which is illustrated in Figure 1.4 below, and the terms highlighted in red indicate the areas where the research was focused.

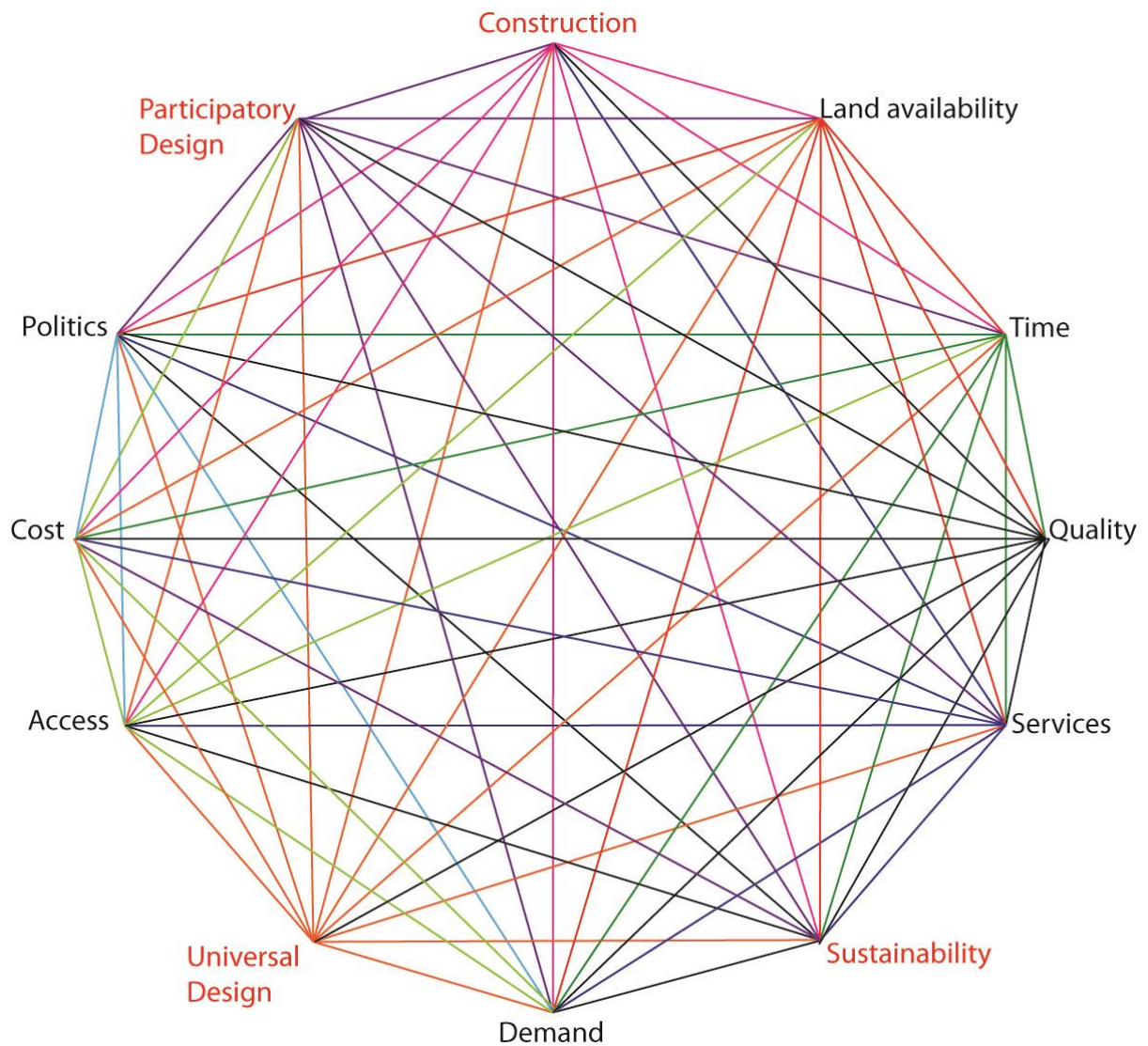


Figure 1.4: A diagram of the 'wicked problem' associated with social housing in South Africa. It illustrates how all the factors that influence housing are interrelated and interlinked to create a complex multi-layered problem that hampers delivery of housing (Source: Author's construct, 2015).

Based on the above illustration and the basic description of the so-called 'wicked problem' associated with low-cost housing in South Africa, the author's main focus for this research was mainly on issues around access. The following related aspects were investigated:

- **Construction:** This pertains specifically to the quality of the designed and constructed housing developments to be able to accommodate all types of people.
- **Participatory Design:** This looks at the extent to which people from the community are involved in the design and development process, to create a sense of ownership of the new homes.
- **Universal Access:** This could be used to better define the design of the community to be inclusive of diverse human needs as well as to provide universal access to houses

and to the surrounding infrastructure which would be beneficial to people throughout their lifetimes.

- **Sustainability:** As housing developments are a long-term accommodation solution, it is required that the houses are sustainable in terms of their construction which should be ecologically sourced and constructed, as well as the facilities that are provided for residents to provide economic sustainability, for instance the provision of space for setting up micro-enterprises.

1.4 Objectives and Contributions of the Study

The overall objective of this study was to use an integrated approach that combines UD and design thinking methods to compile a list of socio-technical recommendations concerning the design and layout of low-cost houses in Cape Town, South Africa. This was achieved by focusing on the following objectives:

- To gain an understanding of what is being done in the low-cost housing sector on a global scale, and which implementations could be applicable in the South African context. The design and construction of low-cost housing occurs on a global level and by investigating what has already been done elsewhere, the outcomes of this study could be related to international projects.
- To identify the main reasons for the lack of the implementation of UD by interviewing professionals within the system of design of low-cost housing in South Africa. Through gaining this knowledge, future design flaws in the low-cost housing sector could be prevented / circumvented, and a means of disseminating information to professionals concerning UD and the application thereof could be identified.
- By investigating the needs of people who live in the low-cost housing sector, from both the social and technical perspectives, it would be possible to tailor the findings from international research to best suit these needs.
- To propose a three-tier system of design recommendations in line with the concept of UD; through Participatory Design (PD), it would be possible to apply these to low-cost housing within Cape Town, and perhaps also to other settlement areas in South Africa.

The three-tier list of design recommendations, which is the ultimate result of the study, is intended as a guideline of considerations for future housing developments. It was developed through engagement with people living in low-cost housing communities and has a strong focus on UD, in order to enable the design of more cohesive communities through housing development.

The contribution that this study intends to make is to highlight the social, community and technical needs and desires of people living within the low-cost housing sector within Cape Town, using the lens of UD to articulate possible future housing designs and layouts of such housing developments with the aim of enhancing access, safety and security and bringing about a sense of community and Ubuntu.

1.5 Delimitation of the Study

This study focuses on low-cost housing developments in Cape Town, South Africa. More specifically, the research uses a two-pronged approach to investigate the social and technical aspect of low-cost housing. The information that was gathered from the people living in the low-cost houses, which related to their experiences, was presented to the professionals in the related fields during the interviews, but ideally this process should have been reiterated numerous times to get a more distilled set of requirements. The sample size of the people interviewed, both from the low-cost housing developments as well as the professionals, was small and should have been increased to offer a wider spectrum of recommendations.

Communication with people from low-cost housing developments was conducted in English and Afrikaans but a translator for the use of Xhosa would have ensured that no details went amiss. The physical design limitations of this study are predetermined by the existing size (40 m²) and cost of low-cost houses. These limitations are defined within existing tender applications. The outcomes of this study are designed within these prescribed restrictions of existing housing tenders.

In view of the so-called 'wicked problems' associated with social housing in South Africa, as discussed above and as indicated in Figure 1.4, the areas of most importance to this study are indicated in the sections above.

1.6 Structure of the Thesis

All initial research to gather the relevant literature for the study was desktop based. The literature covered topics such as "apartheid", its more recent applicable laws, policies and regulations; it investigated the situation around low-cost housing in South Africa, the Western Cape and Cape Town. The literature review also covered various design notions, such as UD and PD; it considered the differences between 'a house' and 'a home'; and finally the review included research on several housing initiatives that have been run to date to meet housing backlogs.

Once the research was validated, collated and re-scripted, a series of case studies were reviewed. These case studies were based on international and local best practice in low-cost housing structures, for which detailed information is presented as findings. A series of interviews were then conducted in order to establish what the two different approaches to housing entail: the first was a 'top down' approach, involving interviews with professionals in the housing sector, including architects and academics; the second was a 'bottom up' approach, which consisted of interviews with people living in low-cost housing development areas in Cape Town. In conjunction with the interviews, a series of assessments were conducted on some existing low-cost housing units, which were collated in the form of written notes and photographs, especially with regard to the accessibility of the housing units; these assessments were conducted with the permission and consent of the home owners.

Based on the best practices and findings, both international and local, and in conjunction with best practices in UD and PD, a three-tier set of recommendations was then developed for future low-cost housing developments. This three-tier system was structured in increasing size of application, viz. from the individual home at the first tier, to the surrounding precinct at the second tier, and the all-encompassing community on the third tier.

1.7 Summary

As explained above, this thesis aimed to identify and address the socio-technical issues within the context of current low-cost housing schemes in Cape Town, South Africa, through the application of UD thinking in order to create a better sense of community and to increase the sense of homeliness, security and Ubuntu, by formulating a three-tier list of recommendations for consideration when designing future low-cost houses. As Gilbert and Koblitz stated in *Cape Town: World Design Capital 2014 Bid Book*,

“Cape Town is today becoming a design-led City committed to meeting the challenges of development and transformation. Through this (commitment), our ultimate goal is to achieve a sustainable, innovative, inclusive and more liveable African City rooted in the strengths of our people and communities”
(Gilbert & Koblitz, 2011: 2).

Having defined the context within which the research has taken place as well as defining the 'wicked problem' with in which the area of housing in South Africa is concerned, this Chapter serves to introduce the research areas and sketch outlines from where the findings were extracted. Following this Chapter is a comprehensive literature review that informed the base research to this study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

In order to understand the context within which South Africa established its cultural divides / established apartheid, this chapter starts by briefly investigating the social context that created such divisions within the country (Section 2.2). In 1994, with the advent of democracy in South Africa, these divides, which had been created from the 1950s onwards, were abolished – at least from a legislative perspective – and new laws and policies were enacted to overcome the wrongs of the past (Gilbert & Koblitz, 2011: 5). The new laws and policies are briefly reviewed through the lens of UD (Section 2.3). In this review, the inception of the RDP housing programme is also highlighted, as this was the start of official housing development programmes in South Africa (South Africa, 1994a: 7). The current status of South Africa's low-cost housing programme is then ascertained / determined by looking mainly at newspaper articles, to establish an up-to-date outlook on housing developments that were constructed at the time that the research was conducted (Section 2.4).

As UD forms the main lens for the research herein, it is important to give a thorough introduction and explanation of this approach (Section 2.5); this will include the history of UD, its principles and its importance, as well as its benefits and beneficiaries. Similarly, PD is the tool through which information was gathered from people living in low-cost housing developments, and is therefore also introduced in this chapter (Section 2.6).

Thereafter, this chapter investigates themes around housing and homes, including Maslow's model on the Hierarchy of Needs and its link to the Millennium Development Goals as set out by the United Nations (of which South Africa is a member), as well as an overview of the Universal Declaration of Human Rights, as also formulated by the United Nations (Section 2.7). Also as part of Section 2.7, a study that was conducted in the United States for which the findings were published in 2010 is then reviewed. In the study, conducted by the John S. and James L. Knight Foundation, 43 000 individuals were interviewed to determine what they deemed necessary within an environment to enable them to create an attachment to that environment (2010). The study makes several recommendations that form the three-tier list for design considerations and recommendations, which is an objective of this research.

Lastly, Section 2.8 looks at the People's Housing Process (PHP) as a method of construction that has been employed throughout South Africa: this is an option to allow people to be more

involved in the construction of their houses, as opposed to the initial RDP models. The traditional PHP model was subsequently reviewed in response to criticism it had received in order to provide a more cohesive approach to construction.

Having looked at this, the literature review provides the base from which the research was started and commences with the research on 'apartheid' and the legacy we still see today.

2.2 The Historical Divide

Although many South Africans may wish to regard apartheid as something that belongs in the past and that is no longer relevant today, 21 years later, the legacy of apartheid still lives on in the design of our cities. Although one cannot deny that South Africa has made some progress in overcoming the barriers that were designed to divide the nation, poverty and inequality are still rife, which indicates that the work is not yet complete (Gilbert & Koblitz, 2011:5).

The concept of "white supremacy" was not unique to South Africa (where it manifested as apartheid), but also prevalent in other British colonies, in Africa as well as in Asia. "But in South Africa it developed into systematic and legalized discrimination shaping the economic, social and political structure of the whole country in a more pervasive way than elsewhere" (Worden, 1994:65). Segregation based on a person's skin colour gradually took shape in the country, as various pieces of legislation were slowly implemented between 1902 and 1930 (Worden, 1994: 72-77). By the start of the 1950s, apartheid had been fully established in the country, meaning that all South Africans had effectively been categorised according to race. The following are some of the legislative policies that were enacted during this period:

- 1949 The Prohibition of "Mixed Marriages" Act;
- 1950 The Immorality Act, which "prohibited all sexual contact between whites and any other South Africans";
- 1950 The Group Areas Act, which established racially separated residential areas ("many coloured inhabitants of Cape Town suburbs were relocated in segregated areas despite local council objections");
- 1953 The Reservation of Separate Amenities Act, which "enforced social segregation in all public amenities";
- 1953 "Educational apartheid took place in schools";
- 1954 The Natives Resettlement Act, which "gave power to forcibly remove Africans to separate townships";
- 1955 "Educational apartheid took place in Technical Colleges";
- 1959 "Educational apartheid took place in Universities".

Information from *The Making of Modern South Africa* by Nigel Worden (1994: 96-99).

It is due to design, informed by the apartheid laws listed above, that an estimated 28% (in 2011) of the City of Cape Town's residents currently live in informal settlements on the outskirts of the city (Gilbert & Koblitz, 2011: 5). In the *Western Cape: Informal Settlements Status* report (2012: 18) by the Housing Development Agency (HDA), it is estimated that there are more than 200 informal settlements in the Western Cape, and more than half of these are located in the City of Cape Town:

"If the goal of equality for all is to be achieved, then equitable opportunities are the key. When we divide people into groups, we risk [not meeting] the objective of achievement of quality of life for all people." (Preiser & Ostroff, 2001: Chapter 2.8)

In order to redesign our city and our communities to achieve equality and quality of life for all people, proactive steps need to be taken by municipalities, cities and nationally. Having introduced the background to 'apartheid', the following section is an overview of the laws and policies that have been implemented since the fall of 'apartheid' to rectify the wrongs of the past that led to the segregation of a culturally diverse nation.

2.3 South African Laws and Policies to address Social Divisions

The impact of apartheid on our country is undeniable; despite the formal abolition of race-based segregation, we continue to be influenced by the legacy of apartheid and, to this day, we are still struggling to overcome the divisions it caused (Thematic Committee, 2001: 2).

To rectify the situation caused by apartheid, various laws, policies and acts have been put in place to encourage the creation of equal opportunities to all people, specifically with regard to housing, but also in all other spheres of life. These include the following, in order of enactment:

- *White Paper on the Reconstruction and Development Programme* (dated 23 November 1994)
- *New Housing Policy and Strategy for South Africa* (ratified 01 January 1994)
- *Constitution of the Republic of South Africa* (signed in Cape Town on 18 December 1996) (hereinafter referred to as 'the Constitution')
- *Integrated National Disability Strategy White Paper* (signed by the then Deputy President, T M Mbeki in November 1997)
- *Housing Act* (ratified 19 December 1997)

- *Promotion of Equality and Prevention of Unfair Discrimination Act No 4 of 2000* (assented to on 2 February 2000, commenced on 16 June 2003)
- *National Building Regulations, Part S: Facilities for Persons with Disabilities* (SABS, SANS 10400-S: 2011, edition 3)
- *Breaking New Ground* (05 August 2004)

In Sections 2.3.1 to 2.3.8 below, a review of each of these laws/policies/acts in turn is presented, identifying the particular concepts or sections that are relevant to this research regarding aspects of UD and equality.

2.3.1 The Reconstruction and Development Program (RDP)

This was established to aid transformation and stabilization, to improve the economic conditions of the country, to give all South Africans the opportunity for a better life and to encourage nation building in order to “reverse the crisis created by apartheid” (South Africa, 1994a: 7). It was enacted on 23 November 1994, after the African National Congress (ANC) came into power in May 1994, when Dr Nelson Mandela became the first President of a democratic South Africa. The paper has not been reviewed since then. The following six principles listed in the White Paper on Reconstruction and Development (South Africa, 1994a: 8-9) form the crux of the RDP program (each principle has been interpreted by the researcher):

1. A commitment has been made at all levels of Government to implement an affordable, sustainable and integrated program.
2. PD is imperative to the success of the RDP. Government is expected to be transparent and inclusive in all decisions regarding the RDP.
3. Equality and respect for all citizens of the country are the underlying principles; these in turn feed peace, security and stability among all South Africans.
4. The White Paper emphasises nation building: “It is on the basis of our unity in diversity that we will consolidate our national sovereignty.” (South Africa, 1994a: 8-9)
5. Basic infrastructure must be increased to meet basic needs and to promote economic growth.
6. Democracy must be implemented at all levels of society to ensure the success of the RDP.

2.3.2 New Housing Policy and Strategy for South Africa

Various relevant sections of the policy document, titled the *New Housing Policy and Strategy for South Africa* (South Africa, 1994b: 11-58), are summarised below. The document starts by referring to the previous “ineffective and inequitable cities” that were created as a result of past policies.

According to Section 3.3.2: *Structure of South Africa’s Human Settlements* (South Africa, 1994b: 11), “South Africa’s history has produced a wasteful settlement structure with several specific inherent constraints that need to be overcome:

- Concentrated need: high rates of urbanisation have concentrated housing needs in urban areas;
- Inefficient and inequitable cities: the geographic segmentation of living areas according to race and class, urban sprawl, and disparate levels of service provision and access to amenities in different areas make South Africa’s cities very inequitable, as well as inefficient and relatively expensive to manage and maintain; and
- dispersed rural settlement structure: the dispersed nature of many rural settlements hamper servicing and make access to socio-cultural amenities problematic.”

Section 3.3.8: *Sociological Issues* (South Africa, 1994b: 14-15) identifies the need for special needs housing. This is because “many social features of South African society pose important constraints and challenges to the future housing policy”:

- “special needs housing: prevalent social problems in South Africa have increased the need for special needs housing, such as old age homes, homeless shelters and frail care facilities”(ibid);

This is therefore interpreted as the need to better accommodate the diversity of the human condition within each community and not exacerbate the current condition of locating people with special needs to the outskirts or within specific areas.

Section 4.2: *National Housing Vision* (South Africa, 1994b: 21) defines housing in the following terms:

“Housing is defined as a variety of processes through which habitable, stable and sustainable public and private residential environments are created for viable households and communities. This recognises that the environment within which a house is situated is as important as the house itself in satisfying the needs and requirements of the occupants.”

Government strives for the establishment of viable, socially and economically integrated communities, situated in areas allowing convenient access to economic opportunities as well as health, educational and social amenities, within which all South Africa's people will have access on a progressive basis, to:

- *A permanent residential structure with secure tenure, ensuring privacy and providing adequate protection against the elements; and*
- *Potable water, adequate sanitary facilities including waste disposal and domestic electricity supply.”*

Based on this extract, housing is therefore defined as more than just a structural unit, it is defined as requiring to be the basis for a community, it takes cognisance of the environment in which it should be located, it makes mention of the social and economic integration as well as the creation of opportunities for access to health and educational facilities.

Section 5.7.1.3: *Effective and Integrated Development* (South Africa, 1994b: 57) states that “policies, administrative practice and legislation should promote efficient and integrated development, in that they promote integration with respect to social, economic, physical and institutional aspects of development”.

Section 5.7.1.5: *Non-Discrimination* (South Africa, 1994b: 58) asserts that “the principle of non-discrimination should be upheld in all policies, administrative practices and laws relating the land delivery process. This is of particular importance in the rural context and in respect of gender equality.”

2.3.3 The Constitution of the Republic of South Africa

The following sections of the Constitution, under the *Bill of Rights* (South Africa, 1996: 7-39) are relevant for our thesis:

- Section 9 (3), dealing with equality states that “The state may not unfairly discriminate directly or indirectly against anyone on one or more grounds, including race, gender, sex, pregnancy, marital status, ethnic or social origin, colour, sexual orientation, age, disability, religion, conscience, belief, culture, language and birth”. This means that all people are entitled to equal opportunities.
- Section 24 (a) regarding environments states that “Everyone has the right to an environment that is not harmful to their health or well-being”. This is interpreted as meaning that environments should be designed such as not to pose a risk of injury to anyone, nor to be hazardous or endanger the health of anyone in any way.

- Section 26 (1) concerning housing states that “Everyone has the right to have access to adequate housing”.
- Section 28 (1) (c) specifically states that “Every child has the right to basic shelter”.

2.3.4 Integrated National Disability Strategy White Paper

The *Integrated National Disability Strategy White Paper* (signed by the then Deputy President, T M Mbeki in November 1997) expresses a vision for the creation of the Integrated National Disability Strategy, namely, to create a “Society for all” (South Africa, 1997a: 17):

“By accommodating the structures of society so that they function in a way that meets the needs of all, society mobilises the potential of all its citizens and, consequently, strengthens its developmental potential. People with disabilities are a natural and integral part of society as a whole, and should have opportunities to contribute their experience, talents and capabilities to national and international development. The concept of a society for all, encompassing human diversity and the development of all human potential, captures the spirit of the human rights instruments of the United Nations.” (1997a: 17)

The objectives that this White Paper aims to achieve include:

- 1. the facilitation of the integration of disability issues into government developmental strategies, planning and programmes;*
- 2. the development of an integrated management system for the coordination of disability planning, implementation and monitoring in the various line functions at all spheres of government;*
- 3. the development of capacity building strategies that will enhance Government’s ability at all levels to implement recommendations contained in the Integrated National Disability Strategy;*
- 4. a programme of public education and awareness raising aimed at changing fundamental prejudices in South African society.” (ibid)*

These sections serve to indicate that people with disabilities should be included in the understanding and defining of a society and in order to create a ‘society for all’ is pivotal that the inclusion of all people be considered and incorporated. The *Integrated National Disability Strategy* is also a driving force to move away provisions for people with disabilities but to rather design/plan/construct communities that are universally accessible.

2.3.5 Housing Act

The following sections of the *Housing Act* (South Africa, 1997b:5-7), in Part 1 “*General principles applicable to housing development*”, section “a” to “e” are particularly relevant to this study:

“National, provincial and local spheres of government must -

- (a) give priority to the needs of the poor in respect of housing development;*
- (b) consult meaningfully with individuals and communities affected by housing development;*
- (c) ensure that housing development -*
 - (i) provides as wide a choice of housing and tenure options as is reasonably possible;*
 - (ii) is economically, fiscally, socially and financially affordable and sustainable;*
 - (iii) is based on integrated development planning; and*
 - (iv) is administered in a transparent, accountable and equitable manner, and upholds the practice of good governance;*
- (d) encourage and support individual and communities including, but not limited to, co-operatives, associations and other bodies which are community based, in their efforts to fulfil their own housing needs by assisting them in accessing land, services and technical assistance in a way that leads to the transfer of skills to, and empowerment of, the community;*
- (e) promote -*
 - (i) education and consumer protection in respect of housing development;*
 - (ii) conditions in which everyone meets their obligations in respect of housing development;*
 - (iii) the establishment, development and maintenance of socially and economically viable communities and of safe and healthy living conditions to ensure the elimination and prevention of slums and slum conditions;*
 - (iv) the process of racial, social, economic and physical integration in urban and rural areas;*
 - (v) the effective functioning of the housing market while levelling the playing fields and taking steps to achieve equitable access for all to that market;*

- (vi) *measures to prohibit unfair discrimination on the ground of gender and other forms of unfair discrimination by all actors in the housing development process;*
- (vii) *higher density in respect of housing development to ensure the economic utilisation of land and services;*
- (viii) *the meeting of special housing needs, including, but not limited to, the needs of the disabled;*
- (ix) *the provision of community and recreational facilities in residential areas;*
- (x) *the housing needs of marginalised women and other groups disadvantaged by unfair discrimination; and*
- (xi) *the expression of cultural identity and diversity in housing development;”*

The Housing Act also refers to respecting, protecting, promoting and fulfilling the Bill of Rights (South Africa, 1997b: 7) of the Constitution. Specifically, it emphasises the importance of consulting with people from the communities and creating an integrated society through housing developments; it also states that no discrimination will be tolerated.

2.3.6 Promotion of Equality and Prevention of Unfair Discrimination Act

The following sections of the Promotion of Equality and Prevention of Unfair Discrimination Act (PEPUDA) No 4 of 2000 (assented to 2 February 2000, commenced on 16 June 2003) are relevant herein:

Section 6: Prevention and general prohibition of unfair discrimination

“Neither the State nor any person may unfairly discriminate against any person.”

Section 9: Prohibition of unfair discrimination on the ground of disability

“Subject to section 6, no person may unfairly discriminate against any person on the ground of disability, including -

- (a) denying or removing from any person who has a disability, any supporting or enabling facility necessary for their functioning in society;*
- (b) contravening the code of practice or regulations of the South Africa Bureau of Standards that govern environmental accessibility;*
- (c) failing to eliminate obstacles that unfairly limit or restrict persons with disabilities from enjoying equal opportunities or failing to take steps to reasonably accommodate the needs of such persons.*

This is an important piece of legislation as it clearly states the obligatory compliance with the SABS regulations, and within this context it is a specific referral to SANS 10400 Part S (2011) which deals with “Facilities for People with Disabilities”. The PEPUDA is also the most statutory legislation on which people with disabilities are able to exercise their rights access in Court.

2.3.7 National Building Regulations

Several sections of the National Building Regulations, Part S: Facilities for Persons with Disabilities (SABS, 2011) are relevant for our purposes too:

“S1 Application

- 1) *Facilities that accommodate persons with disabilities shall be provided in any building except the following:*
 - a. *any building of which the whole of the ground storey comprises one or more occupancies classified in terms of regulation A20 as B1, B2, D4, H4, J1 or J2;*
 - b. *any building classified as H1 in terms of the regulation A20 where such building has less than 25 bedrooms and it can be reasonably proven that it is not possible to include wheelchair access in certain aspects of the design; and*
 - c. *any storey above ground floor level of a building classified as H3 in terms of regulation A20 and not provided with a lift.” (SABS, 2011: 25)*

“S2 Facilities to be provided

- 1) *In any building contemplated in regulation S1 requiring facilities for persons with disabilities:*
 - a. *persons with disabilities shall be able to safely enter the building, use all the facilities subject to the provisions of sub regulation (3) within in and leave it;*
 - b. *there shall be a means of access suitable for use by persons with disabilities, from the main and ancillary approaches of the building to the ground storey; via the main entrance, and any secondary entrance;*
 - c. *there shall be a means of egress suitable for use by persons with disabilities from any point in the building to a place of safety in the event of an emergency;*

- d. *any lift installation that is provided shall be capable of serving the needs of persons with disabilities who are likely to be using the building;*
- e. *any commonly used path of travel shall be free of obstacles which limit, restrict or endanger the travel of persons with disabilities, or which prevent persons with disabilities from accessing the facilities provided in the building and the presences of such obstruction shall be made evident in a suitable manner to persons with impaired vision; and*
- f. *a suitable means of access shall be provided to any auditorium or hall situated in any building and such auditorium or hall shall, in relation to its seating capacity, be provided with sufficient open space to accommodate a reasonable number of persons who use wheelchairs or other assistive devices.” (SABS, 2011: 25)*

2.3.8 Breaking New Ground

The new human settlements plan, as set out in the BNG policy document (South Africa, 2004) reinforces the vision of the Department of Housing, to promote an integrated society through the development of sustainable human settlements and quality housing.

“Within this broader vision, the Department is committed to meeting the following specific objectives:

- *Accelerating the delivery of housing as a key strategy for poverty alleviation*
- *Utilising the provision of housing as a major job creation strategy*
- *Ensuring that property can be accessed by all as an asset for wealth creation and empowerment*
- *Leveraging growth in the economy*
- *Combating crime, promoting social cohesion and improving quality of life for the poor*
- *Supporting the functioning of the entire single residential property market to reduce duality within the sector by breaking the barriers between the first economy residential property boom and the second economy slump*
- *Utilizing housing as an instrument for the development of **sustainable human settlements**, in support of spatial restructuring.” (South Africa, 2004: 7)*

The following sections of this document are specifically relevant for our purposes:

Section 3: From Housing to Sustainable Human Settlements, “Sustainable human settlements” refer to:

“well-managed entities in which economic growth and social development are in balance with the carrying capacity of the natural systems on which they depend for their existence and result in sustainable development, wealth creation, poverty alleviation and equity”. (South Africa, 2004: 11)

Section 3.6: Developing social and economic infrastructure

“Construction of social and economic infrastructure – Municipalities must determine the need for social/community facilities through a community profile and facilities audit to ensure that facilities are appropriately targeted. It is thereafter envisaged that a multipurpose cluster concept will be applied to incorporate the provision of primary municipal facilities such as parks, playgrounds, sport fields, crèches, community halls, taxi ranks, satellite police stations, municipal clinics and informal trading facilities.” (South Africa, 2004: 14)

Section 3.7: Enhancing the Housing Product

***“Enhancing settlement design** – The Department will investigate the introduction of enhancing measures and incentives to include design professionals at planning and project design stages, and will develop design guidelines for designers and regulators to achieve sustainable and environmentally efficient settlements. This is aimed at promoting the development of dignified size of house that supports morality of family and society.*

***Enhancing housing design** – Within the rural context, there is a need to make housing interventions more effective, to enhance the traditional technologies and indigenous knowledge, which are being used to construct housing in rural areas and to improve shelter, services and tenure where these are priorities for the people living there.” (South Africa, 2004: 16)*

Section 8: Information, Communication and Awareness Building

“Several inter-related strategies are required to provide housing related information to sector stakeholders and communities. This information and communication process is however no longer restricted to information on the subsidy, but has been broadened to focus on the broader residential market and now encompasses a greater emphasis on community mobilization.” (South Africa, 2004: 26)

Although planning and integrating inclusive design into policies and regulations is a step in the right direction, the implementation thereof is even more important. This is emphasised by Mammon et al. (2008: 27), who talk about the South African context of Urban Landmarks:

“as experience shows, having good policy and legislation in place does not guarantee good city making and a sensibility on the part of government, technocrats and professionals that the most vulnerable category of citizens form a significant part of the city and have to be included.”

They go on to say that some policies are “failing to respond to local needs, resulting in a continuation of dysfunctional urban areas in South Africa” (Mammon et al., 2008:5). This sentiment is shared by Smit (2006: 7), who referred to “Regulatory frameworks, planning and building regulations, standards and administrative procedures”, as possible “barrier(s) to development”. If they are implemented, they must be adaptable to the needs of the society and the intended users and, “in order to be sustainable and replicable, it has been found that urban upgrading initiatives must be undertaken in a way that is inclusive and responsive to local conditions” (Smit, 2006: 7)

“If the minds and hearts of those who hold power in the public domain do not shift, we have no hope of creating the inclusive city” (Mammon et al., 2008: 28).

Therefore, if essentially only policies and legislation in put in place and all people are not encouraged to undergo a paradigm shift to create a broad, all-inclusive society, then the policies and laws are without cause. Through understanding what all of the requirements of local policies and acts are stipulating, it is obvious that these have had very impact on the way our cities and communities are currently being design/planned/constructed.

In the previous eight sub-sections/above, we have identified some of the important acts/policies, etc. that are relevant to this study; in the next main section, we will be looking at the situation of low-cost housing in South Africa, with a particular focus on the Western Cape and Cape Town.

2.4 Low-cost housing in South Africa

According to the *New Housing Policy and Strategy for South Africa* (1994), which was published at the time when the RDP was ratified, there was an estimated housing shortage of 1.5 million in South Africa. The rate at which the need for housing was increasing was higher than the rate at which the houses were being produced; this is still the situation today. It was reported that, by the end of 2010, there was a shortage of more than 2.2 million

housing units across the country (Nhlabathi, 2010). It should be mentioned that this increase in the demand for housing is not only due to population growth and the fact that annual housing targets are not being met, but also due to the construction of inferior houses, as part of the RDP. Civil unrest in response to the poor quality of RDP houses (amongst other reported issues) has frequently been reported in the local media. Other concerns raised by protesters are that the administration system with regard to such housing developments is sometimes faulty and that excessive waiting periods for housing are also contributing to negative public perceptions of the RDP. At the end of 2010, it was found that some people had been on the waiting lists for subsidised houses since 1996 (Madumo, 2010).

RDP housing and its negative connotations have been a topic of discussion for many years; unfortunately, problems in this regard remain prevalent. Tokyo Sexwale, from the Department of Human Settlements, has called some of the RDP houses “shoddy” referring to the general poor quality of houses (Davids, 2010).

According to the Thematic Committee, a team established by the Habitat Agenda to investigate the challenges in housing policies and programmes for adequate housing and sustainable human settlements, (Thematic Committee, 2001: 6) in their report titled *The South African Housing Policy: Operationalizing the right to adequate housing*, published in June 2001:

“The wording of the housing right provision corresponds with the International Covenant on Economic, Social and Cultural Rights (1966). In that context, ‘adequate housing’ is measured by certain core factors: legal security of tenure, the availability of services; materials, facilities and infrastructure; affordability; habitability; accessibility; location and cultural adequacy.” (2001: 2-3)

Another topic, which in my view is just as relevant as the quality of the houses, although it has not received the media coverage and therefore the attention it deserves, is the general inaccessibility of low-cost houses and their poor layout. Although special preference is supposedly given to people with disabilities (IOL News, 2010) and although grants have been allocated to assist such individuals (Mphelo, 2009), there still appears to be a lack of design thinking that facilitates the inclusion of people with diverse human needs in low-cost housing developments.

One of the problems South Africa is facing with regard to providing houses for the poor, both effectively and economically, is that we still have challenges in providing special needs

housing for people with disabilities and illness as well as HIV/AIDS and “improving the habitability of the new residential environments developed through the housing programme” (Thematic Committee, 2001: 6). This is also the opinion of Osman and Gibberd (2008), who agree that most of the people living with HIV could experience some form of disability due to Opportunistic Infections.

Freddy Ngobe (spokesperson for the provincial Department of Human Settlements in Mpumalanga) reportedly said that “People with disabilities are unfairly represented in all spheres of life. This leads to a variety of social problems including inaccessibility to houses” (Masinga, 2009). Recognising the shortcomings with regard to accessibility of the RDP houses, the government approved additional grants to enable people with various disabilities to make the necessary adaptations to their houses to facilitate access (Mphelo, 2009; Thematic Committee, 2001). In March 2009, however, it appeared that the BNG policy and the additional grants to allow for the modification of houses for people with disabilities, had in fact failed people in the communities. As part of stakeholder meeting in Johannesburg for people with disabilities on their ability to access RDP housing grants and subsidies, most stakeholders described the houses as “not user friendly” and that people “were not able to leave their houses when it rained” and they suggested that “there must be integration and areas should not be set aside only for disabled people”. (Mphelo, 2009) This further indicates that the existing housing developments meant that people with disabilities were being excluded from the communities, leaving them more vulnerable to crime, and ironically even further disabled by the lack of accessibility, by their isolation, and by the lack of the support system that one usually finds in a community setting.

“Creating the conditions for improved access to safe and healthy shelter, secure tenure, basic services and social amenities such as health and education, is essential to any individual’s physical, psychological, social and economic development and well-being.” (Moreno et al., 2010: 27)

In the early 2000s, the South African government realised that their vision for subsidised housing projects (in terms of the RDP) had various shortcomings: most importantly, the RDP “suffered from a fundamental problem: it underestimated the land crisis” (Swilling, 2007: 7). In August 2004, the BNG policy was thus instituted to supersede the White Paper on the RDP. Due to the social and economic issues that were experienced during the RDP, the BNG policy was introduced, with an emphasis on the “development of socially inclusive housing projects, an informal settlement upgrading program, and provision of infrastructure and services for low-income communities” (Human Rights Watch, 2009). The enactment of this policy can be seen as an admission by Government that the implementation of the RDP had overlooked the social and economic situations of the people living in subsidised housing,

as well as an admission that there were certain issues that had not been considered in the implementation of the RDP.

Even though legislations, like the Constitution of South Africa, the Housing Act, the BNG policy and others have been designed to promote equality amongst all people in the country, we still have areas that have not been integrated fully into communities. There are housing developments that are being designed that do not offer universal access into the front door. Designing accessible and inclusive environments and spaces would benefit more than half (60%) of the South African population, which would include the elderly, children, people who are HIV-positive/have AIDS, people with temporary disabilities and people with disabilities. Yet, the elderly, children, people who are HIV-positive/have AIDS, people with temporary disabilities and people with disabilities are still not treated as equal with specific respect to access (Osman & Gibberd, 2008: 3).

Occupants of existing low-cost houses are thus expected to modify or adapt them to suit their specific needs, and this is costly (Osman & Gibberd, 2008: 3). Government has made available grants for people with disabilities, in addition to their housing subsidies, to enable them to make such alterations (Mphelo, 2009); effectively, this is an attempt to overcome the lack of implemented design features of the low-cost houses to facilitate the full integration of the community. Duguay (2010) states: "The government has established that the largest problems in South African society for disabled persons are the threats posed by social exclusion". The lack of integrated "special needs" housing as a challenge faced by South Africa was also identified by the Thematic Committee who presented their findings to the United Nations Centre for Human Settlements (Thematic Committee, 2001: 7).

Although there are various technical limitations of subsidised housing projects, such as plot size, location and costs, it appears that the element of design has been left out of the process of implementing subsidised houses. Traditionally, the first feature that comes to mind when one is considering to build a new house is its design, but this has not been the case in low-cost housing projects. The design and construction of these houses are left to the developers and Mammon et al. agrees:

"Design is unfortunately in many cases treated as an afterthought and perceived as a luxury in our context where resources are scarce and basic needs dire. However, it should be remembered that the act of design in the planning domain is a vehicle through which the economy can be maximised. It is also a means to ensure that built solutions are responsive and appropriate." (Mammon et al., 2008: 28)

Edgar Pieterse mentions in *City Futures* (2008: 108) when referring to planning and decision making on “improving the quality of life” that “the intended beneficiaries must be actively involved and drive the process”, which is also referred to as Active Participatory Design (Section 2.6). Within this section it is highlighted that it is pivotal that when developments and spaces for people are design and planned by professionals that a level of competence is required in both the fields of UD –in order to transcend mere functionality- and in PD – so that the beneficiaries are able to drive the process. In the current design and planning of environments and spaces for people, this is however not the case as UD and PD are generally the processes that enjoy the least the attention and focus during extensive projects. This sentiment is echoed the Association of People with Physical Disabilities (APD) who states that “Planning professionals do not recognize the specific details required in providing a barrier free environment” (APD Limpopo, n.d.). The reasoning for professionals (such as Architects, Designers, Planners, Buildings Contractors) not ‘recognising’ the required features that create access in an environment could be either the lack of awareness and training in this field (and therefore ignorance) or that they are skilled in this area of design but are not willing to make the effort to incorporate UD and PD into the design process.

With that said, it is understood that detailed and extensive PD processes are time consuming (and therefore have an additional cost associated with it) but designing environments, and specifically housing developments, without undergoing these processes it leads to houses that are designed for more agile people, which are the minority of a community.

Due to the ever increasing requirement to provide housing and the constantly diminishing levels of local resources, paired with the increase in exchange rates and therefore an increase in conventional/traditional buildings materials (such as steel); alternative, locally sourced materials should be incorporated into the design and construction processes. Through PD, recipients of the houses should be educated on the reasons for making this shift from traditional construction materials (brick and mortar) to more economic design and material choices. Local authorities agree with this notion of implementing new construction methods and alternative design models. Janet Semple (MPL, DA Gauteng Housing Spokesperson) said, in response to the State of the Province Address, “we must focus on accelerating the pace at which we deliver housing to all citizens by exploring alternative solutions and new models” (Semple, 2011).

Through initiatives such as the BNG policy, it is understood that “National, provincial and local government share the vision of creating sustainable human settlements in which social,

economic and community life can flourish” (The Western Cape Department of Human Settlements, 2010: 13). However, the policy was published in 2004 and the housing sector is still not implementing the intended requirements: “South Africa (still) faces a housing challenge of massive proportions” (The Western Cape Department of Human Settlements, 2010: 11). Mark Swilling from the Sustainability Institute of South Africa concurred:

“Ten years of housing policy have had an extremely negative effect, not just in maintaining the apartheid spatial framework, but also in fundamentally undermining the household economies of poor people, particularly in the City of Cape Town.” (Swilling, 2007: 8)

Mammon et al. (2008: 13), arguing directly against the BNG policy, say that is “questionable as to whether Breaking New Ground (BNG) as an inclusive housing policy would solve existing housing backlogs against the enormous need.” Therefore the ultimate paradox that the low-cost housing development sector then faces is how to design/plan with people from the communities (through PD), houses that are universally accessible (through the application of UD) which are constructed from sustainable materials and laid out in a manner to offer economic opportunities for people.

The Western Cape Department of Human Settlements defines “inadequate conditions” in terms of housing to include “shacks, backyard dwellings, overcrowded formal dwellings with no sanitation” (2010: 7). Based on this definition, an estimated 375 000 households in the Western Cape live in “inadequate conditions” (The Western Cape Department of Human Settlements, 2010: 7); of which an estimated 110 000 of these households live in shacks, according to a community survey conducted in 2007 (The Housing Development Agency, 2012: 6-14). Although a precise count is not possible, a common means of determining the number of shacks in an area is to use an automated counting program that derives the number of shacks from an aerial view of a location (The Housing Development Agency, 2012: 9). This method is illustrated in Figure 2.1 below; the homes are located in such close proximity to each other that they have no boundaries and no structural layout, making the counting process very difficult.



Figure 2.1: An aerial view of the township of Gugulethu, Cape Town. Image from: Google Earth, Gugulethu, Cape Town, South Africa.

This vast number of people living in shacks is located in an estimated 234 dense informal settlements in the Western Cape (The Housing Development Agency, 2012: 9). According to statistics, “132 000 children under the age of 18 live in shacks not in backyards corresponding to 36% of the total Western Cape population who live in such dwellings” (The Housing Development Agency, 2012: 21). Accordingly in 2010, the “Department of Human Settlements’ Five-Year Strategic Plan estimates the provincial housing backlog at between 400 000 and 500 000” (The Western Cape Department of Human Settlements, 2010: 11).

Given the provincial perspective, the number of people who live in shacks in Cape Town is the highest throughout the entire Western Cape (The Western Cape Department of Human Settlements, 2010:7). These figures are confirmed by the Housing Development Agency (HDA), who found that, “according to the 2007 Community Survey, at 84,000 the City of Cape Town has the highest number of households living in shacks not in backyards in the Western Cape” (The Housing Development Agency, 2012:16) which is in comparison to the Eden District which is the next highest density of people living in shacks which has a total number of 12,000 (The Housing Development Agency, 2012:16). To contextualise this in terms of the housing backlog, based on a report from the Western Cape Department of Human Settlements, the City of Cape Town has a housing backlog of 225 000 houses (2010: 18), which is more than half of the total provincial housing backlog. These houses are expected to house children and the elderly, as well as people who suffer from disease or illness, or who have varying types and degrees of disability.

As these previous sections indicate, the housing backlog number is growing and Cape Town has the highest provincial density of people living in shacks and that the professional sector, who’s responsibility it is to provide adequate housing to people are either uneducated in

aspects of UD and PD or are not interested in design/planning and constructing in this manner. Leading from the information, a thorough understanding of UD is essential in fully comprehending the extent to which it can offer benefits to all people and a community as a whole. The following sections provide an overall description and definition of UD, to create a better understanding of the concept.

2.5 Universal Design

This section provides an introduction and the definition of UD as well as a brief overview of its history and how the terminology originated. The principles of UD were developed as a tool for achieving UD through the application and consideration of the principles. Then the importance and benefits of UD are defined, followed by the beneficiaries. As the rights of people with disabilities were the initiating stimulus for the finding and implementation of UD, an overview of the means in which disability is defined internationally is explained and then the associated challenges that have been experienced on an international level, with the implementation and incorporation of UD.

2.5.1 Introduction to Universal Design

The essence of UD and its incorporation is “a truly multidisciplinary approach to resolving social and technical issues” (Preiser & Ostroff, 2001: Chapter 3.11). UD is a design methodology that extends beyond the built environment and infrastructure, to services, products, information access and marketing and communication. UD is therefore a tool with which to design for all people, a way of thinking; a paradigm.

“Universal Design is the design of products and environments to be usable by all people to the greatest extent possible, without the need for adaptation or specialized design” (Center for Universal Design, 2008a)



Figure 2.2: The accommodation of all member of society, including people with disabilities, children and the elderly. (Image from: *Designable Environments: Consultants in Accessibility and Future Care Planning*, n.d.)

Universal Design is the product of similar design initiatives in various design fields, such as ‘Accessible Design’, ‘Barrier-free Design’, ‘Design-for-All’, ‘Design for Disability’, ‘Inclusive Design’, ‘Transgenerational Design’ and ‘Universal Access’, all of which are consolidated to form the overarching concept of UD (M’Rithaa, 2009: 62-73). The essence of this theory is also reflected in D’Souza’s statement that “Universal Design came into being as a body of concepts” (D’Souza, 2004: 3). To understand UD as a whole, a few interpretations of the concept are summarised below:

- Wendy A. Jordan describes UD as a “concept crystallized out of the desire to make products and places safe and accessible for everyone” (Jordan, 2012: 10).
- The aim of a Universally Designed environment is that it “accommodates the diversity of needs, and enables the entire population to move around the environment freely and unhindered” (APD Limpopo, n.d.).
- “Universal Design is a framework for the design of places, things, information, communication and policy to be usable by the widest range of people operating in the widest range of situations without special or separate design. Most simply, Universal Design is human-centered design of everything with everyone in mind” (Institute for Human Centered Design, 2012a).
- The concept of UD “works well for people across the spectrum of functional ability, it works better for everyone” (Institute for Human Centered Design, 2012b)
- “Universal Design is a concept that extends beyond the issues of compliance with accessibility standards for people with disabilities and offers a powerful rationale for responding to the broad diversity of users who have to interact with the built environment” (Preiser & Ostroff, 2001: Chapter 3.2).

- Universal Design is 'good' design, as it is the preferred means of designing; in the broadest terms, it can be described as "designing for all people" (Null & Cherry, 1996: 25).

Similarly, Inclusive Design (which was founded in the UK, just after the initial finding of the concept of UD in the USA) seeks to remove the barriers that create unnecessary effort and as a consequence results in separation. It enables everyone to participate equally, confidently and independently in everyday activities (Centre for Accessible Environments, n.d.). Inclusive Design is defined as "the design of mainstream products and/or services that are accessible to, and usable by, as many people as reasonably possible on a global basis, in a wide variety of situations and to the greatest extent possible without the need for special adaptation or specialised design; sometimes used as a synonym for Universal Design" (M'Rithaa, 2009: 19).

Although the phrases such as Inclusive Design, Accessible Design, Design-for-all, etc. all refer to the same understanding of the design process and its requirements, the term Universal Design is the preferred terminology as it is free of the stigma of designing for people with disabilities (see terms such as Design-for-all, Inclusive, Disability as indicated above) and is independent of relations to only the built environment which is associated with terms such as Access/Accessibility/Barrier-free etc. Having defined the general and sometimes synonymous terminology for UD, the following section provides the history of the notion of UD, which is of specific importance as the progress to Universal Design was initiated by disability rights but this was not the only instrument for the developments and subsequent incorporation thereof.

2.5.2 Brief History of Universal Design

In the 1950s, Europe, Japan and the USA began to shift their focus towards designing for people with disabilities, with the aim of moving people with disabilities from institutions back into their communities. This period happened to coincide with the end of the World War II, and injured veterans returning from the front lines sought to live independent lives, albeit back in their communities rather than being confined to institutions (Preiser & Ostroff, 2001: Chapter 2.3). This might well represent the early beginnings of UD. Initially, the process was termed barrier-free design, and it focused on removing obstacles, specifically in the built environment and primarily for people with functional physical disabilities; however, it generally excluded various other groups of people with disabilities, such as the Blind, Deaf or people who are illiterate or foreign (Institute for Human Centered Design, 2012b). Another early indication of UD in the USA in the 1950s was a Supreme Court case in 1954, which ruled that "separate educational facilities are inherently unequal" (D'Souza, 2004: 4).

The 1960s saw the birth of the civil rights movement in the USA, which led to the Civil Rights Act for Racial Minorities in 1964, which in turn sparked the campaign for the rights of people with disabilities. It involved a movement away from designing to accommodate people with disabilities and towards the “idea of normalization and integration”, which was when the phase ‘Accessible Design’ began to be used. “For the first time, design was recognized as a condition for achieving civil rights” (Institute for Human Centered Design, 2012b). The first legislation to incorporate the notion of Accessible Design was Section 504 of the Rehabilitation Act of 1973, which requires that

“no otherwise qualified individual with a disability ... shall, solely by reason of her or his disability, be excluded from the participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance” (Case, 2008: 2).

The 1980s were a period of great progress for UD, as designers everywhere were requested to consider people with disabilities as well as the aged in their design work; the World Design Congress in 1987 specifically looked at these ideas. This encouraged the implementation of UD in the design phase of the conceptualization of ideas, which quickly spread to other design disciplines, “as they realised that better design helps everyone” (Case, 2008: 2).

The 1990s saw the development of the UD principles (Case, 2008: 2; Jordan, 2008: 13), as more legislative changes were implemented to employ the concept. The Americans with Disabilities Act (ADA) of 1990 “substantially exceeded the requirements of Section 504 of the Rehabilitation Act and derived most of its language directly from the Civil Rights Act of 1964 with additional requirements for accessible design” (Institute for Human Centered Design, 2012b). In terms of the scope of the ADA, “all activities, services, and programs of public entities are covered, including activities of state legislatures and courts, schools, town meetings, police and fire departments, motor vehicle licensing, and employment” (Institute for Human Centered Design, 2012b) The ADA of 1990 furthermore increased awareness and encouraged implementation of the UD principles, which fed into “the provisions of the Technical Assistance Program and the Telecommunications Act of 1996”; in 1998, “Section 508 of the Rehabilitation Act Amendments... included Universal Design as part of the requirements” (Case, 2008: 2).

2.5.3 Principles of Universal Design

In the 1990s, a group of experts was assembled to express the core aims of incorporating UD into design (Jordan, 2008: 13; Levine, 2003: 20). The Centre for Universal Design outlined seven principles of UD; a brief description of the aim of each principle is included in Table 1 below. For further and more detailed information on the Principles of UD, please see **Appendix A**.

Table 1: Seven Principles of Universal Design with short descriptions and examples within the context of housing. (Table adapted from: Center for Universal Design, 2008b)

Principle Number	Title	Brief Description	Housing Example
One	Equitable Use	The design is useful and marketable to people with diverse abilities.	By creating level access to the entrance to a house, all users that are being accommodated are able to access the house independently.
Two	Flexibility in Use	The design accommodates a wide range of individual preferences and abilities.	By designing kitchens with slightly lowered counter surfaces, children, the elderly and people short in stature are able to use the same working surface.
Three	Simple and Intuitive Use	Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current level of concentration.	By designing the layout of each room in the house to have, for example, the light switches in the same location, it will increase the ease with which inhabitants are able to navigate around each room.
Four	Perceptible Information	The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.	If alarms were fitted to housing developments and properties, these should include both audible and visual communication, to allow all users in the area to be alerted.
Five	Tolerance for Error	The design minimizes hazards and the adverse consequences of accidental or unintended actions.	Installing fuses in electrical boxes prevents a burnout of the electrical installations and therefore prevents possible fires by tripping the fuse when there is an overload on the electrical box.
Six	Low Physical Effort	The design can be used efficiently and comfortably and with a minimum of fatigue.	If all faucets had lever handles, inhabitants would have no problems opening taps, if they have physical limitations or wet/dirty hands.
Seven	Size and Space for Approach and Use	Appropriate size and space is provided for approach, reach, manipulation, and use, regardless of the user's body size, posture, or mobility.	Once furnishings are being decided on for the homes, the design should be accommodating of the space that is needed for circulation and movement around the furniture.

2.5.4 Importance of Universal Design

The UD approach is an important step in any design process, as it represents a more inclusive or holistic approach to products and environments. It ensures that accessibility for people of all abilities is a priority for the community as a whole, giving freedom of choice and freedom of movements to all individuals throughout their lifetimes. The notion of UD has removed the concept of designing to accommodate for special needs and thus takes on a holistic approach to designing for all people (Null & Cherry, 1996: 25):

“Universal Design, also known as lifespan design, seeks to create environments and products that are usable by children, young adults, and the elderly. They can be used by people with ‘normal’ abilities and those with disabilities, including temporary ones” (Null & Cherry, 1996: 25).

The application of the principles of UD is a progressive step towards eliminating discrimination against people of different ages, races, genders, religions or abilities and enables all people to have equal access to opportunities; the key to creating these opportunities lies within the design process. Goldsmith (1976: 13) in *Designing for the Disabled* agrees, stating that:

“[P]eople who are disabled are people who need help from architects, help in the planning of the houses they live in and the design and organisation of the buildings they use for work, education, recreation and so on. They need opportunities to participate in the busy life of the world, to be involved, to do the same sort of things that other people do. They need to be able to get the most out of life and they need architects to help them.”

Null and Cherry in *Universal Design: Creative Solutions for ADA Compliance* (1996: 27) describe four considerations for creating a UD, which further demonstrate the importance of incorporating UD in the everyday design:

1. UD supports
2. It allows for adaptability
3. It is accessible
4. It is safety orientated.

Universally designed features and infrastructures are well planned, accessible, barrier-free, beautiful, and they are comfortable for all. (Jordan, 2008: 10)

Consequently, when UD is incorporated in the design of ‘things’, it allows all people an opportunity to interact or use the facility/building/product; in most cases, it is in fact not a person’s disability that denies them access or opportunity or services, but rather the environment, which manifests a lack of consideration in the design process. This is the argument of Preiser and Ostroff in the *Universal Design Handbook*, who stated that “good design enables, and bad design disables, irrespective of the user’s abilities” (2001: Chapter 3.4) and that “people are disabled by design” (2001: Chapter 4.1). Figure 2.3 below is a good example of this: the elderly lady in her wheelchair at the foot of a staircase illustrates that, without an alternative means of access, she is restricted and prevented from making use of this area. It is therefore not the ability that is limiting the user but rather the environmental design.



Figure 2.3: A direct example of how people could be “disabled by design”. (Image from: 123RF. 2013)

Although they are not specifically referring to UD but rather to good design more generally, Mammon et al. (2008: 28-29) explain that, by using design from the start of a process, a “functional urban environment” can be created; but even more importantly, the use of design from the start also ensures that the elements that make up a coherent community “relate to one another in such a way that they perform as a coordinated urban system” (ibid). Integrated design furthermore “has a significant effect on the lives of urban dwellers, in particular the urban poor”; “more importantly, it is the adoption of a particular integrated approach to planning that sees the role of design as a vital component of the urban delivery process” (Mammon et al., 2008: 29), which relates to the direct benefits within a process that good design can offer.

2.5.5 Benefits of Universal Design

Some of the benefits of using UD, according to Null and Cherry (1996: 28-32), are listed below:

1. Supportive: Designs aid users without creating a burden; designs are instinctively usable, and create a sense of pleasure during use.
2. Adaptable: Designs are able to accommodate a wide user group with varying needs without the need for changing the design.
3. Accessible: by means of good design, barriers and restrictions are removed, thus making the design accessible to a wide range of users.
4. Safety-Oriented: the designs “promote health and well-being”; creating safe and intuitive designs makes them both “corrective and preventative”- in the sense that if people used a design incorrectly it would be able to rectify the use thereof as well as prevent injury to the user.
5. Economic: UD does not focus on the creation of products for the individual but rather on designing for a broader spectrum of users. This is because the same design can be used by many different individuals, rather than being specifically custom-made for an individual.
6. Aesthetical: it prevents the inclusion of *ad hoc* features or products which usually look less integrated by designing to incorporate accessibility and use, as opposed to designing an additional feature or product to solve an existing problem.
7. Marketable: Universally designed features or products are easier to use by the majority of people.

The above reasoning is supported by Levine (2003: 8-9), who argues that UD makes economic sense as designing with UD principles and its methodology from the beginning of the design process could save additional costs of changing features later in the design process as well as it being marketable to a larger market of users, thereby increasing the sales target market, also imply that the beneficiaries of the product/design are increased.

2.5.6 Beneficiaries of Universal Design

Osman and Gibberd, in their presentation titled “Housing for Special Needs: Physical Interior Design to Accommodate Special Needs” (2008: 2), defined inclusive environments as

“environments that account for the needs of users, including people who are physically disabled, people with sensory disabilities: both hearing and sight, people with learning disabilities, people with mental illnesses, elderly people, young children, people with heavy luggage, people with dexterity problems, people with neurological problems, woman who are very

pregnant, people who are in a hurry and not looking where they are going, people who have had an accident and are temporarily disabled, people who are not wearing their glasses that day, people who are distracted or concentrating on something else. In fact, all of us require an inclusive environment”.

Extending beyond disability and beyond natural diversity, we can also examine personal circumstances and temporary health problems. Many people appreciate and directly benefit from universally designed features in the environment; these would include:

- Families moving around with a pram or small children
- People who are temporarily unable to perform their daily tasks, such as someone with a broken arm/leg or a person with a neck or back injury
- Pedestrians with luggage or persons performing delivery tasks
- Even people who, in the course of everyday life, find themselves operating differently because their activities (e.g. people carrying briefcases, small children or even a cup of hot coffee) are altering the way in which they customarily navigate through an environment

UD could therefore be said to be of benefit to everyone, including children, the elderly, persons with mobility limitations, persons with sight limitations, persons with cognitive limitations, persons who are linguistically challenged, pregnant women, persons who are inebriated, persons who have become obese, those who use strollers and prams, tall people, short people, those requiring luggage access, visitors in an unfamiliar city and service personnel (Levine, 2003: 3). “Universal Design, in short, benefits everyone everyday by helping us all overcome obstacles routinely encountered in our daily lives” (Levine, 2003: 4). Preiser and Ostroff (2001: Chapter 4.1) similarly suggest that all people are likely to be disabled by the design of their environment or surroundings at some point during their lives.

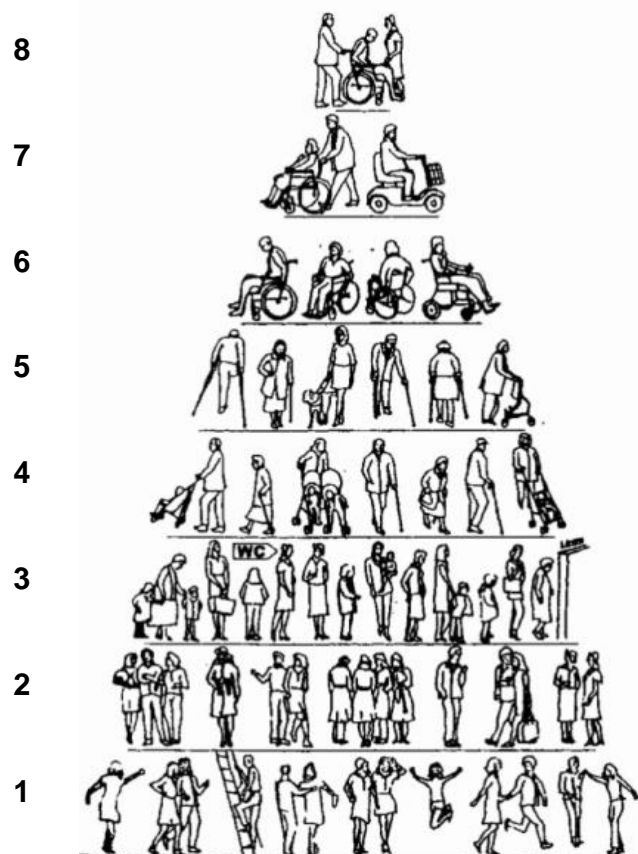


Figure 2.4: User population pyramid of people who benefit from designing for people above them in the pyramid. Image from: Preiser & Ostroff, 2001; Goldsmith, 1976

The above pyramid shows the broad spectrum of users in the bottom-up UD methodology. It illustrates the fact that, by designing for people with the most severe disabilities, designers are effectively able to accommodate *all* people:

- **Row 1** represents users who are “fit and agile” and who have no trouble running, jumping, leaping, or climbing ladders/stairs.
- **Row 2** represents users who are regular “able-bodied” people, those who use general facilities and environments without any trouble.
- **Row 3** introduces the representation of women and children – and denotes where architects begin to fail the users of facilities.
- **Row 4** introduces the elderly, as well as people with strollers and prams.
- **Row 5** represents “ambulant people with disabilities”.
- **Row 6** represents independent wheelchair users.
- **Row 7** represents people who use electric scooters and wheelchairs as well as people who need an assistant or companion.
- **Row 8** indicates those users who require two assistants.

(Preiser & Ostroff, 2001: Chapter 25.3)

Preiser and Ostroff (2001: Chapter 3.11) made the following statement, referring to designing for the elderly:

“As we struggle for a world that is seamlessly accessible, seamlessly supportive, and seamlessly caring, we must never forget that no machine will ever be able to replace the superior wisdom that comes only with age and experience.”

Similarly, in the case of children, they point out that, “neither should we forget that it is childhood that provides the foundation for that superior wisdom” (2001: Chapter 3.11). These statements emphasise the importance of designing in a way that is inclusive of children and the elderly, as well as people throughout all other stages of life. Likewise, UD must also adopt a holistic approach towards the inclusion of all cultures, and not just all ages.

2.5.7 Defining Disability

Being mindful of the aspirations contained in the notion of UD, ideally we should not be using categorising phrases and models at all; however, for the purposes of legislation, service provision, development programmes and advocacy campaigns, the phrase ‘people with disabilities’ is helpful in addressing the common problems experienced by this diverse group of people (IDC Consultants, 2012). Within the phrase ‘people with disabilities’, moreover, there are further defining terms of disability; most prominent are models of disability and the International Classification of Function, Health and Disability (commonly known as ICF). First defined in this section are four models of disability:

- **The Moral Model** (disability is punishment as a result of sin)
- **The Medical Model** (disability is purely a defect or sickness, which must be cured through medical intervention)
- **The Rehabilitation Model** (disability is a type or form of deficiency that must be corrected by a rehabilitation professional or other helping professional)
- **The Disability Model** (disability is a consequence of environmental, social and attitudinal barriers that prevent people with so-called impairments or functional limitations from maximum participation in society)

(IDC Consultants, 2012)

These models of disability will be described in more detail in Table 2 below.

Table 2: Definition of various disability models. Table compiled from: IDC Consultants (2013); Kaplan (Unknown Date).

Model	Description
Moral Model	The oldest of the models, which generally regards disability as the result of sin and characterises it as a tragedy; the person with the disability is viewed as a victim of circumstance, deserving of pity. These models are condemned as dis-enabling, and the cause of much discrimination. This model moreover insinuates that the person with a disability is in need of care and charity in order to survive, and not capable of looking after themselves or managing their own affairs. This model tends to lead to ignorance, fear and prejudice.
Medical Model	This model regards disability as a sickness that must be cured through medical interventions. Disability is herein defined as being contained within the individual. The medical model is furthermore based on the notion that people with disabilities are dependent upon society, which results in paternalism, segregation and discrimination. The medical model holds that disability or functional limitation results from an individual's physical or mental impairment or disability; it is largely unconnected to social or geographical environments. The medical model places the source of the problem within a single impaired person, and concludes that solutions are found by focusing on the individual. The relationship that exists within the medical model can be described as that of the fixer (professional) and the fixee (the client) and clearly contains an inequality that limits collaboration.
Rehabilitation Model	Similar to the Medical Model, the Rehabilitation Model regards people with disabilities as having a deficiency caused by disability and as being in need of additional services by a professional in terms of rehabilitation, including training, therapy and counselling.
Disability Model (Also known as the Social Model)	<p>The Social Model, as opposed to the Medical and the Moral Model, is based on the notion that people with a disability are consumers of what society offers; disability is viewed as a consequence of environmental, social and attitudinal barriers that prevent people with so-called impairments or functional limitations from maximum participation in society.</p> <p>The social model recognizes that individual members of society may have so-called impairments or functional limitations; however, such 'disability' is not located within the individual, but rather in the society that fails to account for such individuals. The social model of disability is fundamentally concerned with addressing equality and equal access.</p> <p>The strength of the model lies in the fact that emphasis is placed on society and not on the individual, while at the same time, it focuses on the needs of the individual.</p> <p>The social model assumes that persons have a disability, when the society around them has imposed barriers, restrictions and prejudices that create the disability. The model therefore is focused upon viewing any evident functional deficiencies in an individual as a challenge to society as a whole and demands the implementation of inclusive solutions, which address the needs of all individuals.</p>

The shift from the moral model to the social is beneficial to the people that it seeks to classify as it encourages a more holistic approach to integration as the social model strives to create opportunities for the overall inclusion of people in society, it empowers all people to

participate in decision making and designing processes that affect people of all abilities. (IDC Consultants, 2013)

The ICF, on the other hand, is a framework and means of classification that

“conceptualises functioning as a ‘dynamic interaction between a person’s health condition, environmental factors and personal factors.’ The ICF provides a standard language and conceptual basis for the definition and measurement of disability, and it provides classifications and codes. It integrates the major models of disability – the medical model and the social model – as a ‘bio-psycho-social synthesis’. It recognises the role of environmental factors in the creation of disability, as well as the role of health conditions.” (WHO, 2013: 3)

This system aims to provide an all-encompassing description of health and health-related conditions, which is instrumental in defining and understanding disability as well as other health-related parameters of well-being.

“The ICF covers the entire life span. An on-going process of updating the ICF is managed by WHO and its classifications network to enhance ICF relevance for the population at all ages.” (WHO, 2013: 3)

The ICF categorises information into two parts which are each divided into two components, according to WHO (2013: 4), namely:

Part 1: Functioning and Disability

Sub-component 1: Body Functions and Structure

Sub-component 2: Activities and Participation

Part 2: Contextual Factors

Sub-component 1: Environmental Factors

Sub-component 2: Personal Factors

The ICF concepts of functioning and disability are drawn from the following definitions within the context of health:

*“**Functioning** is an umbrella term for body functions, body structures, activities and participation. It denotes the positive aspects of the interaction between an individual (with a health condition) and that individual’s contextual factors (environmental and personal factors).*

Disability is an umbrella term for impairments, activity limitations and participation restrictions. It denotes the negative aspects of the interaction between an individual (with a health condition) and that individual's contextual factors (environmental and personal factors).

Body functions – The physiological functions of body systems (including psychological functions).

Body structures – Anatomical parts of the body, such as organs, limbs and their components.

Impairments – Problems in body function and structure, such as significant deviation or loss.

Activity – The execution of a task or action by an individual.

Participation – Involvement in a life situation.

Activity limitations – Difficulties an individual may have in executing activities.

Participation restrictions – Problems an individual may experience in his/her involvement in life situations.

Environmental factors – The physical, social and attitudinal environment in which people live and conduct their lives. These are either barriers to or facilitators of the person's functioning.”

(World Health Organisation [WHO], 2013: 5)

In Table 3 below, we look at defining the structure of the classifications network which is the basis for the ICF coding, definitions and understanding of disability and other parameters of health and well-being.

Table 3: Defines the relationship between the definitions as listed above along with the two components which are defined by part 1 and part 2. Table adapted by IDC Consultants (2013) based on information from: WHO, 2013.

	Part 1: Functioning and Disability		Part 2: Contextual Factors	
Components	Body Functions and Structures	Activities and Participation	Environmental Factors	Personal Factors
Domains	Body functions Body structures	Life areas (tasks, actions)	External influences on functioning and disability	Internal influences on functioning and disability
Constructs	Change in body functions (physiological) Change in body structures (anatomical)	Capacity Executing tasks in a standard environment Performance Executing tasks in the current environment	Facilitating or hindering impact of features of the physical, social, and attitudinal world	Impact of attributes of the person
Positive aspect	Functional and structural integrity	Activities Participation	Facilitators	Not applicable
	Functioning			
Negative aspect	Impairment	Activity limitation Participation restriction	Barriers/hindrances	Not applicable
	Disability			

The purpose of the development of the ICT was to provide a framework that would allow of the universal, concise and standardised quantification of issues related to health. The framework as illustrated in the table above allows each category to be assigned a numerical quantifier which would result in a quantifiable categorisation system. These quantities would then be with regard to the environmental barriers as well as the functional limitations of individuals. (IDC Consultants, 2013)

Having been provided with the categorisations that are used on an international level as means to defined disabilities, for the purpose of being better able to write specific policies and legislation to create contexts where all people are included in the design of the environment, the building of infrastructure, the provision of services and the manufacture of products. However, as mentioned before, having policies and legislation in place for the adoption of UD is a small step toward inclusion, when the crux of the matter is the universal understanding, incorporation and implementation thereof. The next section looks at the challenges that have been faced internationally with the universal adoption of UD.

2.5.8 Challenges along the Road

Having only started with UD movement in, essentially, the late 1960s, the movement itself is reasonably young in comparison with other social movements, but due to the broad category of users that it encompasses the movement has/is experiencing issues that are affecting its long-term development and implementation (Preiser & Ostroff, 2001: Chapter 1.7). The following are cited as issues that, if not dealt with early in the development phase, will hinder the roll-out of UD:

- *“Education of design professionals*
- *Evaluation of the impact of universally designed products and environments*
- *Communication about Universal Design to the general public”.*

(Preiser & Ostroff, 2001: Chapter 1.7)

Preiser and Ostroff (2001: Chapter 3.9) also listed the following issues as restricting the required paradigm shift to the adoption of UD (each of these issues is summarised by the author of this paper):

1. UD is presented as an overall cure for problems in society, which leads to unrealistically high expectations of the results of universally designed products and environments.
2. Professionals are protective of their professions and thereby tend to want exclude influences from other people (some professionals might consider the addition/inclusion of UD into their work as diluting their professions).
3. The need to ‘make a quick buck’ means that designers often neglect the incorporation of UD, as clients in general do not insist on this as a requirement.
4. In general organizations “have seen change as a threat to their status quo”; this leads to resistance to change.
5. Ignorance from professionals is also a potential problem; when one is seen as an expert in a field (e.g. in design or architecture), admitting previous wrongs is difficult.
6. There is a misperception that incorporating UD will increase costs.
7. Miscommunication between various parties involved in a project may create confusion as to who is ‘responsible’ for the incorporation of UD.
8. Advancements in technologies and the associated costs therefore, are creating barriers due to limited access to such technologies. Although technologies are advancing and increasing in ability as well as quantity, peoples ability to access them and use them as intended is, in some cases being restricted.

Along with the need for a paradigm shift in both the public and the professional sectors, Preiser and Ostroff list the following issues as “major challenges” in the social sphere, when it comes to the adoption of UD (2001: Chapter 3.10):

1. To create a legal framework that enhances and protects existing democratic rights.
2. To establish practical rules of engagement, which will encourage people to use new technologies, especially in the context of quality content, easy access, and reasonable tariffs.
3. To promote awareness of the real opportunities that are available to citizens in the areas of work, education, health, environment, new services and the like.
4. To ensure that products and markets meet the highest standards to satisfy consumer needs, in the context of intellectual property, common technical standards, choice of products and services, and so on.

UD should be part of the design process from the beginning of the design phase in order to accommodate the diversity of the people who live in our country. By designing for the ‘minority’ (viz. those who are disabled or who have special needs), this will paradoxically ensure that an even larger amount of people will be able to make use of the same facilities; it would also eliminate the need for “special design” or “special needs” within housing developments and their surrounding infrastructure. Although it appears that government is aware of the importance of consulting with the communities involved in the project through PD (*Housing Act*, South Africa, 1997: 5), it also appears that the information they gathered did not feed back into the housing designs, which is why the incorporation of PD is essential to the success of housing developments. Although PD is being more widely and more easily adopted, especially in the low-cost housing development sector, the importance thereof is still not emphasised enough. Contractors and developers of low-cost housing sectors perform these tasks with little regard for the reasoning for its implementation and how it is intended to affect the development. The following sections provide an overall description and definition of PD, to create a better understanding of the concept.

2.6 Participatory Design

As previously mentioned, PD is/has been more widely and more easily adopted within the South Africa context. This is prevalent in most social projects as there is a general requirement for consulting with the surrounding community where projects are expected to roll-out. However, the extent to which communities are to be engaged as well as the intended outcome of the interactions is very rarely defined. Therefore this section serves to introduce and define PD as well as provide a brief history on its inception. As with UD, the importance and benefits of PD are then highlighted as well as a brief description of the beneficiaries of PD engagements. Lastly, in this section, as PD is/has been reasonably widely adopted within

the South African context, we are able to provide an outline of the challenges that have been experienced in the roll-out of PD.

2.6.1 Introduction to Participatory Design

Participatory Design (PD) is the process of directly involving people in the design/planning process when developing ideas that affect their lives (Robertson & Simonsen, 2013: 2). Sanoff (2000: 1), using a slightly more human-centric description, states that PD is about “involving local people in social problems”.

Robertson Simonsen (2013: 2) describes PD as follows:

“a process of investigating, understanding, reflecting upon, establishing, developing, and supporting mutual learning between multiple participants in collective ‘reflection-in-action’. The participants typically undertake the two principal roles of users and designers, where the designers strive to learn the realities of the users’ situation, while the users strive to articulate their desired aims and learn appropriate technological means to obtain them.”

The above statement effectively refers to users being able to communicate directly with designers and therefore able to offer direct input into the design process; this is likely to result in a better end product, as well as allowing designers to have access to the end users’ feedback before creating a final product. Essentially this is a “process driven by social interaction and engagement” (Robertson & Simonsen, 2013: 3). Again, Sanoff (2000: 3) takes a more human-centred approach in defining what he calls the “consensus organizing model” of PD; he argues that it

“seeks to establish partnerships between private and public sector leaders and community groups by providing effective ways for individuals to use and develop their own skills and creativity on behalf of their community”.

The definition and introduction to PD indicates a strong link to communities and their rights, which is exactly where the origins of the development of PD can be linked to.

2.6.2 Brief History of Participatory Design

According to Robertson and Simonsen (2013: 2), the various human rights movements and social uprisings that continued to take place during the 1960s and 1970s, gave rise to the start of UD and similarly marked the start of PD initiatives. Sanoff (2000: 2) and Robertson & Simonsen (2013: 1-2) share sentiments around the increased demand of societies to be involved in decision-making processes around aspects that affected their lives, in which they

have shared interest and have associated value and societies wanted to be involved as a collective. This awareness of the desires of people to participate in the design of their futures started a questioning trend in various design fields, such as Architecture and Product Design. (Robertson & Simonsen, 2013: 2-9) During the 1990s, PD was used for the first time, to allow for the customisation of processes to better suit users, which was in software development (Robertson & Simonsen, 2013: 9).

The shift from imposing design onto users to involving communities, has led to various terms to define the new movement; it was initially called community participation (where communities were involved in the initial phases of the project development), but has recently has been referred to as community driven projects or community controlled projects (where communities are involved in both conceptualization and implementation of projects) (Sanoff, 2000: 6).

2.6.3 Importance of Participatory Design

As PD is driven by the community or the collective of affected people, the result is based on the desires and needs of people who are involved in the area, will use the product or will be affected by the service, which offers an enriched design/process. "Participatory Design is driven by consistent socio-technical approach that appreciates the context in which the technology will be used and the processes and practices within that context" (Robertson and Simonsen, 2013: 7). By involving people in the community in the design and planning process, different spheres of knowledge are added to the project, which not only improves its outcome but also encourages people to become self-reliant (Davids et al., 2005: 111; Sanoff, 2000: 10).

A PD approach is essential to the success of a development because only the community knows what the community needs and wants; Sanoff (2000: 7) concurs, stating that

"resident driven initiatives have a greater chance of success because residents are more aware of the realities of their own environments than outside professionals. They have a sense of what will work and will not work".

It is especially important to use a PD approach when dealing with community projects, as engagement in the design process increases trust and confidence in organisations in the community, leading to the initiatives being more easily accepted by the affected community as well as promoting community assistance in implementation (Sanoff, 2000: 9).

Babbie and Mouton (2001: 318-319) break down the importance of participation into six main objectives, which are summarized as follows:

1. “Empowerment”: As mentioned in the previous paragraph, sharing knowledge is essential in PD; moreover, through sharing skills people from the communities become self-reliant.
2. “Decreasing Distance”: Community engagement and participation decrease the physical and emotional distance that often exists between the designers/professionals and the communities that are being designed for.
3. “Building a Basis for a Common Field of Knowledge”: Results based on academic knowledge from the designers/professionals and tacit knowledge from the people from the community, form the common field of knowledge.
4. “Producing More Socially Meaningful Research Results”: Through PD, the needs of the community will be better met by means of culturally and socially applicable designs, which in turn will have a positive impact on the sustainability of the design and the community.
5. “Inducing Long-term Motivation”: Through participation, ownership of the community is further encouraged; along with making valuable contributions to the community, long-term motivation will have a positive impact on the sustainability of the community.
6. “Democratizing Science”: This effectively transfers authority from the designers/professionals to the community.

2.6.4 Benefits of Participatory Design

Paul Davidoff, who changed the American Institute of Planners’ code of ethics to include the notion of PD, promoted PD as an essential key to social change, as it is used to “overcome poverty and racism” and it is used to “reduce disparities between rich and poor” (Sanoff, 2000: 4). By bringing people from the community together with dedicated professionals to create a better future for themselves, it enhances the spirit of Ubuntu within the community, as all the members of that community are contributing to their communal upliftment (Sanoff, 2000: 10).

2.6.5 Beneficiaries of Participatory Design

Robertson & Simonsen (2013: 5) define PD as designing/developing/planning futures for real people, as oppose to hypothetical users (think Vitruvian Man). “There is an ethical stand underlying PD that recognises the accountability of design to the worlds it creates and the lives of those who inhabit them” (Robertson & Simonsen, 2013: 5). Babbie and Mouton

(2001: 314) suggest that PD as a methodology is “more responsive to the needs and opinions of local people”.

According to Sanoff (2000: 10), the process of PD benefits the community, the people in the community and the designers (or professionals): For the community, “participation results in a greater meeting of social needs and increasingly effective utilization of resources at the disposal of a particular community”. For the people in the community, there is “an increased sense of having influenced the design decision-making process and an increased awareness of the consequences of decisions made”. And for the designers, “it provides more relevant and up-to-date information than was possible before”.

Therefore the main beneficiaries of PD can be defined as the people affected (people from the community or people who stand as the collective that have shared interests and common values) and people who are affecting (designers, planners, developers and contractors who implement the proposed change), of which both face challenges throughout the process of PD.

2.6.6 Challenges along the Road

Sanoff (2000:3), in his book *Community Participation Methods in Design and Planning*, mentions the importance of ethnic considerations, specifically concerning issues around housing and services. He points out that communities were not able to “reverse the trend toward deterioration” and that there is a need for “multiethnic” community groups to inform the PD process, which requires background research prior to holding discussion groups.

He thus listed the following as challenges in the implementation of PD (Sanoff, 2000: 22-23):

- Professionals, in some cases, are of the opinion that end users do not have the required skills and knowledge to make informed decisions regarding the product/project.
- As PD allows for various representations from the community, the result might be as many opinions and options as there are people in the discussions, which would then require mediation from possibly an external party.
- As different opinions vary, excluding some users opinions might result in people feeling excluded. In the same manner, not involving certain users due to them not fitting the criteria of the task may also leave users feeling excluded.
- Participation could be viewed as threatening by some professionals, as the decision making shifts to the users rather than remaining the sole responsibility of the professional.

- PD is most effective if all participants share their expertise and learn from others' expertise. Many professionals are not prepared to part with their expert knowledge, therefore hampering the participation process, which can be frustrating for all parties.
- To fulfil the practice of PD is more time consuming and therefore more costly.
- People who are involved need to be representative of the majority of the users and not represent a specific issue or notion.
- Characteristics associated with poverty such as "overwhelming personal need, low sense of efficacy and suspicion of bureaucracy", restrict users from participating in social projects that most likely affect them (Sanoff, 2000: 23).

Given these challenges as defined above, the need for the implementation and utilisation of PD is stronger motivated. The challenges identify the main hindrance to the incorporation of PD as the desire of people to want to hold on to a committed decision/plan/design/skill and not allow other people, with different experiences to have an influence. Therefore, essentially the route to the effective and most efficient means to incorporate PD into any project to ensure that the participation takes place from the very beginning of the project, to avoid preconceived ideas from being formed without a holistically informed opinion. Concerning the personality types and the backgrounds (including diverse cultural habits) of people involved in the PD process, these are all important and need to be included in the development process to best inform the results because all people who are represented in the PD discussions will be beneficiaries of the development in the end, one way or another.

Dauids et al. in *Participatory Development in South Africa: A Development Managements Perspective* (2005: 113) state that PD or alternatively termed "Public Participation" has become a catchphrase within the development sector, which is very often used but very seldom holistically practiced, as approaches "tend to be ad hoc, incremental, unstructured, unbalanced and uncoordinated". Although the problems have been identified, by professionals working in this field, the methodologies and application of PD have not been followed through but it "should become a way of life" (Dauids et al., 2005: 111).

Again, these opinions reinforce the requirement to have an active level of participation within projects, and this needs to be part of the design from the very beginning to avoid the majority of the challenges listed above. Within the context of design low-cost housing developments, active PD involvement from the beginning of the conceptual phases of the development can result in the change from a housing development to a cohesive, socially responsible and sustainable community.

2.7 Housing and Homes

As mentioned above, the difference between a house and home can simply be the design processes that are engaged in during the start of the project. This section introduces universal human needs through the explanation of Maslow's Hierarchy of Needs pyramid and then proceeds to link the Millennium Development Goals (MDG) to the requirements for basic human requirements. The next sub-section introduces the Universal Declaration of Human Rights, for which South Africa recognises all 30 Articles, but a few were selected and are listed, to provide a series of cross references between the Universal Declaration of Human Rights, Maslow's Hierarchy of Needs, MDGs, BNG policy, New Housing Policy as well as the Bill of Rights under the South African Constitution. Then lastly this section offers an overview of creating a home, which is largely based on study that was conducted in USA on what constitutes a home and enables people to ownership of the house and the surrounding community.

2.7.1 Universal Human Needs

Figure 2.5 below illustrates the hierarchical order of necessities for human beings, according to Altonen (unknown date). At the very bottom of the pyramid are the "Biological and Physiological needs", which are also described as "Basic life needs", which include "air, food, drink, shelter, warmth, sex, sleep, etc." Simply put, in order to have a safe environment for their families, before people are ready to take responsibility and ownership, before they can have pride in their belongings, in order to have self-awareness and reach self-fulfilment, the basic life needs (e.g. shelter) need to be fulfilled first. Only once the basic needs have been met and once there is a level of security, such as the provision of safe and secure housing, can people start to progress to the next tier in the pyramid.

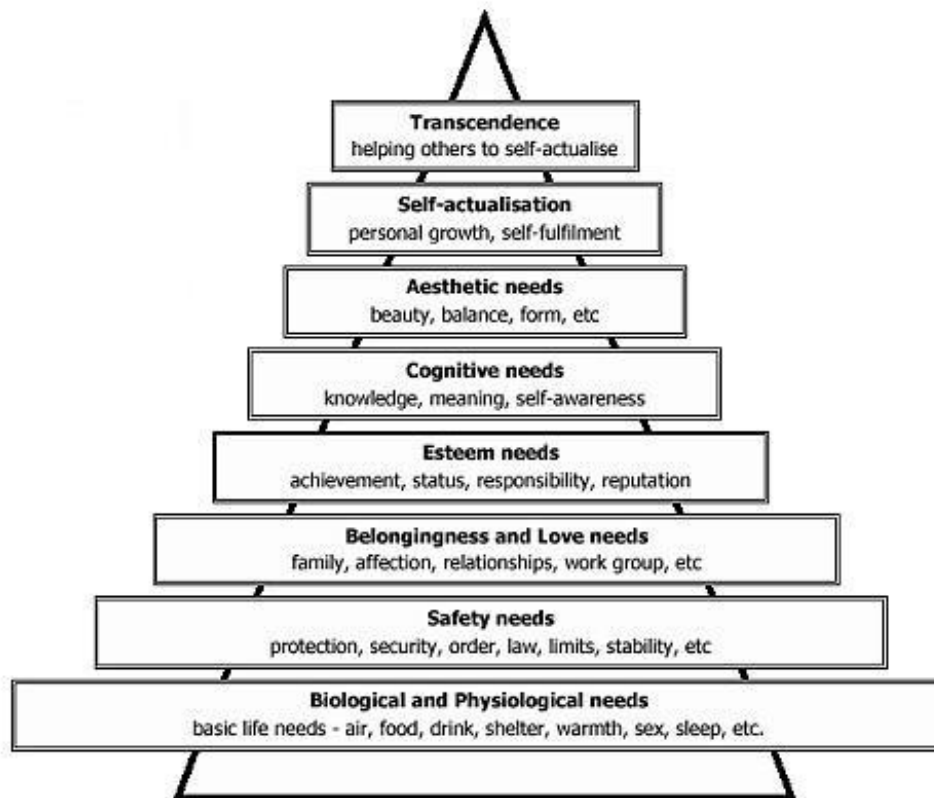


Figure 2.5: Hierarchy of Needs, based on Abraham Maslow's model of the stages. Image from: Altonen, n.d.

By designing communities along with housing schemes, designers are able to facilitate this progress up the pyramid towards “transcendence”, in other words, to help people from the communities that they are designing for to reach a point where they are self fulfilled and able to offer the same level of assistance to another member of the community (be it another community altogether). This is echoed by Mammon et al. who stated that, “with adequate social opportunities, individuals can effectively shape their own destiny and help each other” (2008: 3).

The relationships between most of the points mentioned in the *White Paper on Reconstruction and Development* (South Africa, 1994a), UD and Maslow's Hierarchy of Needs (as summarised in Figure 2.5) can be formulated as follows:

- Integration, inclusiveness, equality and respect for all are some of the main concepts that inform the application of UD and that justify its use in all areas of design.
- “Unity in diversity” has a strong link to the driving force behind the principles of UD.
- Meeting the “basic needs” of people in terms of shelter is one the most important aspects, as it forms the foundation of the pyramid of human needs.

In accordance with Maslow's Hierarchy of Needs, which explains the different needs of human beings and their order of fulfilment, South Africa's Bill of Rights “protects the rights of

citizens to housing and access to basic nutrition, water, shelter, basic health care and social services” (Mammon et al., 2008: 6). Similarly the United Nation’s Millennium Development Goals (MDG) aim to achieve the fulfilment of these needs and rights through critical economic and social development priorities, in acknowledgement of “the importance of socioeconomic goals” (Mammon et al., 2008: 6). The eight MDGs are the result of consensus reached at the United Nations Millennium Summit in 2000, with the aim of fulfilment by 2015 (United Nations Development Programme South Africa, 2013a). South Africa, since it became a democratic country in 1994, has been focused on creating “a democratic society based on the principles of equity”, according the United Nations Development Programme South Africa (2013b); “through the RDP, a commitment was made to meet basic needs” (United Nations Development Programme South Africa, 2013b). This shows a direct correlation to Maslow’s Hierarchy of Needs. Therefore, in order to build an inclusive society, the “Government of South Africa has pledged to promote equality and eradicate poverty (MDGs 1 and 3)” (United Nations Development Programme South Africa, 2013b).



Figure 2.6: Illustrations of the eight Millennium Development Goals for 2015, which were initiated in 2000 by the United Nations of which South Africa is a member. Image from: United Nations, 2000.

In some cases, through policy and legislation, South Africa has made positive strides towards meeting the MDGs as set out by the United Nations. Progress has been made in terms of decreasing the various percentages, in line with the MDGs, including poverty and hunger (MDG 1) and child mortality (MDG 4), as well as increasing enrolments in primary education for both genders (MDG 2), further promoting gender equality and the empowerment of women (MDG 3), improving access to prenatal care for pregnant women (MDG 5), and stabilising the prevalence of HIV/AIDS (MGD 6). Great strides have also been made with regard to environmental sustainability (MDG 7), as well as with regard to increased trade relations with other developing countries (United Nations Development Programme South Africa, 2013b).

In addition to the MDGs set out by the United Nations, South Africa, being a member of the United Nations by proxy, also recognises the Universal Declaration of Human Rights

“as a common standard of achievement for all peoples and all nations, to the end that every individual and every organ of society, keeping this Declaration constantly in mind, shall strive by teaching and education to promote respect for these rights and freedoms and by progressive measures, national and international, to secure their universal and effective recognition and observance, both among the peoples of Member States themselves and among the peoples of territories under their jurisdiction.”
(United Nations, 2013)

The Universal Declaration of Human Rights consists of 30 Articles (United Nations, 2013), which are recited verbatim in **Appendix B**, but the following are related to some of these articles, which have been drawn from previously mentioned legislation and policies:

Article 1 refers to the African term *Ubuntu*, and reiterates that all people are equal with respect to their dignity and rights.

Article 2 makes reference to the notion of UD and the South Africa Bill of Rights when citing that no discrimination of any kind will be tolerated, including but not limited to the basis of “race, colour, sex, language, religion, political or other opinion, national or social origin, property, birth or other status.” (United Nations, 2013)

Article 3 makes mention of the “basic life needs” as defined by Maslow’s Hierarchy of Needs.

Article 7 relates to the Bill of Rights under the South African Constitution, with reference to universal human rights.

Article 21 makes mention of “public services”; these are related to the overarching notion of the MDGs, which in turn is linked to Maslow’s Hierarchy of Needs as well as referring to the existing ideals in the South African Constitution.

Article 22 states that every person “has the right to social security” (United Nations, 2013) which again relates to Maslow’s Hierarchy of Needs, the Constitution, and the BNG policy.

Article 25 states that “Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services...” (United Nations, 2013). This, again, relates directly to the concept of “basic life needs”, as described by Maslow’s Hierarchy of Needs as well as to the right to adequate housing, as set out in the

New Housing Policy and Strategy for South Africa, the BNG policy and the South African Constitution.

Article 26 refers to the right to education, which is a direct reflection of MDG 2: Achieve Universal Primary Education (United Nations, 2000).

Article 27 makes mention of the right of people to engage in the “cultural life of the community”, which is one of the main notions of the BGN policy that, in turn, has a larger focus on the creation of sustainable communities.

Having reviewed Maslow’s Hierarchy of Needs as well as the MDG’s and established links between sections within the South African Constitution, BNG policy, New Housing Policy for South Africa and the Universal Declaration of Human Rights, there is no doubt that the link between PD and UD have a strong relation to aspects of human rights as defined both locally and internationally. The following sub-section introduces additional aspects, beyond what is mentioned previously, with regard to creating a home that people could take ownership of and be proud of, which is essentially the aim of providing people with houses in low-cost housing developments.

2.7.2 Creating a Home

It is commonly said that “home is where the heart is”. If residents do not have any pride in their houses, or do not take ownership of their houses, how can they call it home? How can we move away from creating houses and instead creating homes for people in our country?



Figure 2.7: Home is where the heart is. Image from: Adamsdaughter, 2012.

Internationally and even locally, there has been a migration away from merely providing houses and meeting backlogs (Cocking, 2012), -although those goals are really important too, given the alarming and increasing backlog of housing- towards providing more sustainable houses that focus on “poverty alleviation and socioeconomic issues” and that

include “community development goals, environmental goals, urban transportation and other forms of infrastructure (schools, hospitals, child care, etc.)” where the focus on “community participation” has been emphasized (Smit, 2006: 5-6). This has also been echoed by the large-scale housing developers, who are “increasingly recognizing the necessity of constructing projects alongside broader community infrastructure such as schools, shopping centers, hospitals and public transport” (Cocking, 2012).

Development (such as in the housing sector) should always happen holistically with the aim of addressing poverty through locating developments in close proximity to both social and economic opportunities (Cocking, 2012; Smit, 2006: 5-9); it should include “capacity building, skills development, access to credit, job creation, health, education, community safety, etc.” (Smit, 2006: 5-6).

Smit, referring to the creation of communities, says that

“building and strengthening livelihoods and social cohesion are essential. Upgrading projects are therefore preferable to relocation projects, and effective capacity building and community participation is essential, even if it slows down delivery” (Smit, 2006: 9).

This is also agreed with by Mammon et al. (2008: 12):

“Public facilities, public spaces and institutions, which form the backbone of any public spatial network, provide venues to address critical issues such as health, education and social development collectively. Public facilities and institutions are venues for people to congregate, discuss, perform, protest and interact outside of the confines of their private domains. These are also important spaces for recreation and relaxation, especially given the nature of the majority of the lower income areas, where positive urban space is at a premium.”

In a study conducted by the John S. and James L. Knight Foundation for Knight Soul of the Community 2010, titled *Why People Love Where They Live and Why It Matters: A National Perspective* (2010), 43,000 individuals from various neighbourhoods across the United States of America were interviewed to determine what people deemed necessary within an area or environment to enable them to form an attachment to that environment, and thereby to create a community. In contrast to South Africa, where the emphasis is on job creation and economics, this study indicated that “jobs, the economy, and safety — are not among the top drivers” for creating a community (John S. and James L. Knight Foundation, 2010: 4).

“Rather, people consistently give higher ratings for elements that relate directly to their daily quality of life: an area’s physical beauty, opportunities for socializing, and a community’s openness to all people” (John S. and James L. Knight Foundation, 2010: 4).

Their study goes further to illustrate that there is an emotional connection between the environment and the attachment that a person has towards the area in which they live. By creating an emotional link between the environment and the person, a stronger sense of community is manifested; residents would want to live in such an area, creating ownership and therefore creating pride within a community.

“Community attachment is an emotional connection to a place that transcends satisfaction, loyalty, and even passion. A community’s most attached residents have strong pride in it, a positive outlook on the community’s future, and a sense that it is the perfect place for them.” (John S. and James L. Knight Foundation, 2010: 5)

Their study, which looked at individuals across the United States indicated that the factors that influence people’s connection to their communities seldom vary even in different neighbourhoods. After conducting the study for a number of years consecutively, it emerged that the same three items arose repeatedly:

- Social Offerings — Places for people to meet each other and the feeling that people in the community care about each other;
- Openness — How welcoming the community is to different types of people, including families with young children, minorities, and talented college graduates;
- Aesthetics — The physical beauty of the community, including the availability of parks and green spaces.

(John S. and James L. Knight Foundation, 2010:10)

The Table below serves to list the perceptions of residents during the study, as referred to in this section, to determine the main items/factors that create an attachment to an area/environment. Each column represents what the residents understood of what Social offerings, Openness and Aesthetics is inclusive of. Text highlighted in bold text indicates what the residents found most important of all of the qualities within their community.

Table 4: Lists the aspects that people from the community classified as determining factors to create ownership and attachment to their community. Table created from information by John S. and James L. Knight Foundation. 2010: 11-14.

Social Offerings	Openness	Aesthetics
<ul style="list-style-type: none"> ➤ Vibrant nightlife ➤ Good place to meet people ➤ Other people care about each other ➤ Availability of arts and cultural opportunities ➤ Availability of social community events 	<ul style="list-style-type: none"> ➤ Good place for gays and lesbians ➤ Good place for young, talented college graduates ➤ looking for work ➤ Good place for immigrants ➤ Good place for older people ➤ Good place for racial and ethnic minorities ➤ Good place for families with young children ➤ Good place for young adults without children 	<ul style="list-style-type: none"> ➤ Beauty or physical setting ➤ Availability of parks, playgrounds, and trails

Not part of the annual consecutive lists of items but still listed as key factors in creating attachment among communities were the following:

*“**Education:** Education tends to be one of the higher rated key attachment drivers”*

*“**Geography:** Residents who live within the city limits of their communities tend to have similar attachment to those who live outside the city.”*

*“**Age:** Attachment tends to increase with age. Residents aged 65 and older have the highest attachment scores, on average.”*

*“**Community Tenure:** Residents who have lived in communities studied by the Knight Foundation for three to five years tend to be the most attached. Conversely, the newest arrivals tend to be the least attached.”*

*“**Income:** Attachment tends to increase with income.”*

(John S. and James L. Knight Foundation, 2010: 12-16)

Although items such as the location of housing, security and economic activity are still essential within a community, it emerged from the study discussed above that these items only became relevant once residents felt that they were living in a “social”, “open” and “aesthetic” environment.

As seen throughout South African legislation and previous research on housing developments, there is an emphasis on building shelter and housing, rather than homes and communities. Although there is a movement away from just meeting backlog numbers within the housing context and instead creating sustainable areas or “Human Settlements” (South Africa, 2004), there is still no framework to enable people to create communities that they are proud of, that residents take ownership of and to which people have a sense of attachment. Since the end of Apartheid, local

“policies have acknowledged that physical development needs to be focused on the making of more integrated living environments and goals broadened to include the delivery of community facilities, public amenities, sports and recreational opportunities and other elements considered to be essential urban services” (Mammon et al, 2008:12-13).

However, this has not been the outcome, as these related infrastructural commodities have been provided only sporadically and intermittently, rather than as part of a coherent plan or vision (ibid).

It is my argument/contention that the emphasis needs to shift from the creation of housing to the creation of communities. As Mammon et al. (2008: 12) have argued, the public spaces and the areas around the housing developments are “the primary, and arguably the most important, form of social infrastructure.” It is thus important for South African designers and architects to design homes for and with people as opposed to housing the poor. A more holistic approach needs to be taken with UD and PD, which South African designers need to contextualise. Mammon et al. (2008: 28) explained that successful design best achieved when local, contextual design limitations and opportunities, which are presented by the communities, are adhered to. This therefore allows for the utilisation of both UD and PD, which applied to a specific situation, based on specific people, offers the solution. And so again, the spectrum of application of UD supersedes that of just facilitating access and through the use of PD integrates social, cultural and economic opportunities for people with diverse abilities. (Preiser & Ostroff, 2001: Chapter 5.4)

As a result of the adoption of terminology such as Participatory Processes without the comprehensive understanding of the required outcomes of such processes (and those of Participatory Design), programmes such as the People’s Housing Process (PHP) was initiated and roll-out in South Africa. The following sections deals with both the pros and cons of this housing delivery scheme/programme.

2.8 People's Housing Process

The People's Housing Process (PHP) can be defined as an assisted housing delivery scheme, in terms of which subsidies are used to enable skills transfer, in order to enable people to construct their own houses under guidance and supervision (Manie, 2004).

Table 5 below looks at the pros and cons of PHP as defined by the Development Action Group which exists as function of low-cost housing developments. In the table below, "traditional" refers to the PHP as it was initially designed to be implemented as from 1997, this term however has no contextual reference as there is no other way of going about PHP, which the researcher was aware of at the time of this research.

Table 5: The benefits and criticisms of traditional PHP according to the Development Action Group (DAG).
(Table from: Manie, 2004: 7-8)

<i>Benefits of Traditional PHP</i>	<i>Criticism of Traditional PHP</i>
<p><i>According to DAG, PHP offers the following benefits:</i></p> <ul style="list-style-type: none"> • <i>Assets are built at a household level and because of the home owner's active involvement in the process, he/she is more conscious of the value of the asset. Consequently, these houses have not been sold off, as has been the case with houses built by contractors.</i> • <i>Households understand the trade-offs made between size and quality. These households therefore enjoy greater levels of satisfaction after making a choice about what they can afford and what they need.</i> • <i>Households continue to invest in the housing product – post-occupation home improvements take place, thus making the idea of the 'starter house' real.</i> • <i>The quality of housing has not been compromised by PHP, and houses are generally built to acceptable standards; sometimes, they are even of a better quality than conventional contractor-built units.</i> • <i>The houses are often bigger and more individualized, with households participating in their design.</i> • <i>Valuable building/managing skills are left behind at the household level; these skills can be re-used again later, when home-owners manage their home improvements.</i> • <i>Community consciousness is developed at a household level, leaving valuable organising skills behind in the community.</i> 	<p><i>Sceptics raise many criticisms of PHP; some are well-founded, while others are not. Many of the criticisms are simply rhetoric offered by those who are ignorant of what PHP actually involves and what its results are.</i></p> <p><i>Some legitimate criticisms are:</i></p> <ul style="list-style-type: none"> • <i>The process is long and drawn-out, and is not suited to rapid housing delivery.</i> • <i>In the context of the huge housing backlog, the time required for traditional PHP does not allow it to be the main method of housing delivery.</i> • <i>Traditional PHP is suited to small projects and not large-scale community wide projects.</i> • <i>Complex social dynamics exist in communities, and inviting higher levels of participation often complicates the delivery process.</i> • <i>NGOs make substantial resources and expertise available to communities at a very early stage in a project and continue to do so until the project ends. This raises questions of replicability by the private sector, since the facilitation grant is so low and is only available once the project is</i>

<ul style="list-style-type: none"> • <i>In the post-occupation phase, former PHP groups have the capacity to pursue other community development issues.</i> • <i>The self-esteem of individuals in the household is built, and empowerment of this nature has lasting benefits, which influence all spheres of life.</i> • <i>In post-occupation reviews, a distinctly higher level of satisfaction is expressed by beneficiaries.</i> • <i>PHP has characteristically attracted the participation of women who have often played a leading role in the Housing Association.</i> • <i>PHP creates an opportunity to explore group savings and micro lending, and debunks the myth that the poor are not able to save.</i> 	<p><i>approved.</i></p> <p><i>Ill-founded criticisms include the following:</i></p> <ul style="list-style-type: none"> • <i>The quality of the houses are poorer than what would be achieved in contractor-driven projects.</i> • <i>Poor people are incapable of planning and managing their own housing development projects.</i> • <i>PHP projects result in greater levels of corruption.</i>
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According to Table 5 above, there are many benefits to the use of the PHP; however, given the increasing housing backlog and the lengthy turn-around times of PHP projects, its use is unsustainable. Findings from DAG indicate that even the PHP programme, which is intended to enable poor communities to participate in their own development, has from time to time been led by private contractors. With contractors taking the lead in development and limiting beneficiary participation, many PHP projects have stalled as a result of corruption, financial mismanagement and sub-standard construction (Development Action Group, 2009: 11).

Although PHP is a valuable means of creating ownership for the houses that are constructed, as well as improving the quality of such houses, it has to be supplemented by an alternative means of meeting housing demands on a larger scale, or a means of merging the essential outcomes of the PHP with those of mass-produced housing developments.

2.9 Summary

The last decade has seen very little change in the housing sector, and there is still evidence that there are disparities between what people require from housing developments and what is being delivered by constructors and contractors. The most evident means of identifying this disparity is protest action and unrest in communities where housing developments are being or have been constructed. In the Western Cape (where the housing backlog was 410,000 units in 2008), and where it is expected that even a budget of R2 billion per year would only eradicate the housing backlog by the year 2030 (Mammon et al., 2008: 13), it is imperative that a different approach be adopted. This paradigm shift that needs to occur in the housing industry needs to recognise that the previous approach of 'one size fits all' in terms of housing is unsustainable and does not lead to cohesive, caring and community driven areas of housing. To achieve this, professionals (designers/ contractors/ planners/

constructors) need to create facilities for all people, irrespective of their age, gender, race or ability, through active PD in order to allow people in these environments to make their house their home. This will in turn provide life-span housing and living by creating better communities.

A holistic design approach will greatly benefit all parties involved by creating houses that are able to be accommodated by any people, irrespective of the functional limitation and will contribute to a more financially viable housing development. Poor planning and participation within the low-cost housing house sector has led to the poor design and construction of houses for Cape Town's poorest communities. This has negatively impacted on the rate at which more houses are constructed in order to meet the ever growing housing backlog. Proper prior planning, community involvement and UD can overcome design issues that would result in a better end product for both communities and designers.

“Unfortunately, at present, in a majority of cities, urban planning practice seems to be divorced from any long-term city vision, and many major decisions are influenced by pressures from various stakeholders.” (Moreno et al., 2010: 26).

Stakeholders as referred to by Moreno, above, are largely government parties and contractors and not communities and designers. However, until UD has become a widely recognised design approach, and until the users of the environment become the focus of housing developments and infrastructure, designers will unfortunately continue to design for the hypothetical user (Vitruvian Man). In addition to this, the people who live in these housing developments will continue to digress in terms of social and cultural integration. Communication of the benefits of the notion of UD is important on all levels influencing policy, legislation and more importantly is the implementation thereof. A paradigm shift is required in South Africa to overcome the, still lingering, legacy of apartheid, to design cities and spaces for all people.

CHAPTER THREE

METHODOLOGY AND RESEARCH DESIGN

3.1 Introduction

The methodology and research design are defined in this chapter, starting with the initial research questions (Section 3.2) and the research design as planned at the inception of this research is defined in Section 3.3, while the methodological mapping of the research process that took place is indicated in Section 3.4, with a further more detailed description of the research questions. This chapter provides an overview of, and an introduction to, the research participants from the professional sector as well as community participation (Section 3.5) and also investigates the typologies of PD and defines Participation by Consultation, which was the type of PD that was most readily used during the research.

After a review of the ethical considerations in Section 3.6, the section dealing with measures and analysis (Section 3.8) introduces a tool that was developed by the researcher to establish a means for evaluating four of the main aspects of low-cost housing that are applicable to the research topic, viz. UD for low-cost housing in South Africa. The four categories, namely, UD, Construction, Sustainability and PD, are qualified and their grading criteria are defined. The criteria are only introduced in this chapter, but are properly utilised in Chapter Four: Results and Discussion.

An essential part of the research looked at the socio-technical issues that exist in current low-cost housing developments. This was conducted in two parts; the first was a review comparison on what is being done on both an international and local level in terms of low-cost housing developments (Section 3.8.1). The part was to investigate the issues on existing low-cost housing in Cape Town, for which the researcher undertook UD audits on three different housing developments; the process and methodology of conducting such UD auditing is explained in Section 3.8.2 below.

Section 3.9 introduces the presentation of findings, which include local and international housing audits and a review of a local housing tender. The section concludes by introducing a three-tier list of recommendations for future low-cost housing developments. The chapter is then summarised in section 3.10 before the chapter four is introduced which is the results and discussions chapter.

3.2 Research Questions

The main research question and its sub-questions are formulated as follows:

- Main research question: *How can UD and new construction methods be implemented and utilised to improve the quality of life for people with diverse user needs in low-cost housing?*
- Sub-question 1: *What are the international best practices with regard to low-cost housing?*
- Sub-question 2: *Why is UD not more widely implemented within the low-cost housing sector in South Africa?*
- Sub-question 3: *What are the needs of people living in low-cost houses from a socio-technical perspective?*
- Sub-question 4: *How can UD, informed by PD, better address the socio-technical needs of people living in low-cost houses?*

Having identified the research questions, the initial research planning and outline of the methodology was developed. The next section introduces the research design that was initially planned but which changed to what is presented in the subsequent section (Section 3.4) which was the research methodology that resulted in this findings of this research.

3.3 Research Design

Once the main areas of study was identified through the establishment of the research questions, the research design and methodology as explained in this section outlined the processes for conducting research.

Figure 3.1 below illustrates the methodology used to link all the interrelated research areas, such as: UD, design professionals, socio-technical needs of people living in low-cost housing developments and designing of better communities. It thus illustrates the mapping of the initially proposed research design (before it became the research methodology as depicted in Section 3.4).

The research highlighted the socio-technical needs around the creation of communities and homes through implementing UD thinking in low-cost housing communities in Cape Town. The findings of the research are briefly introduced in Section 3.8: Introduction to Research Findings and a detailed analysis of these findings is available in Chapter 4: Results and Discussion.

The research methodology had the following envisaged / desired outcomes:

1. To gain an understanding of what was being done in the low-cost housing sector on a global scale, and which implementations could be applicable in the South African context. The design and construction of low-cost housing occurs on a global level and, by investigating what has already been done, it was proposed that the outcomes of the local research could be comparable to international projects.
2. To identify the main reasons for the lack of the implementation of UD by professionals within the system of design and construction of low-cost housing in South Africa. Through gaining this knowledge, it was proposed that future design flaws in the low-cost housing sector could be prevented and that a means of disseminating information to professionals concerning UD and its application would be identified.
3. To investigate the needs of people who live in these low-cost houses, from both the social and technical aspects. It was envisaged that the findings from international research could be utilised in the local context in order to best suit these needs.
4. To propose a three-tier system of design recommendations, that would be in line with the concept of UD and that would be applicable to low-cost housing within Cape Town, South Africa, through the use of PD.

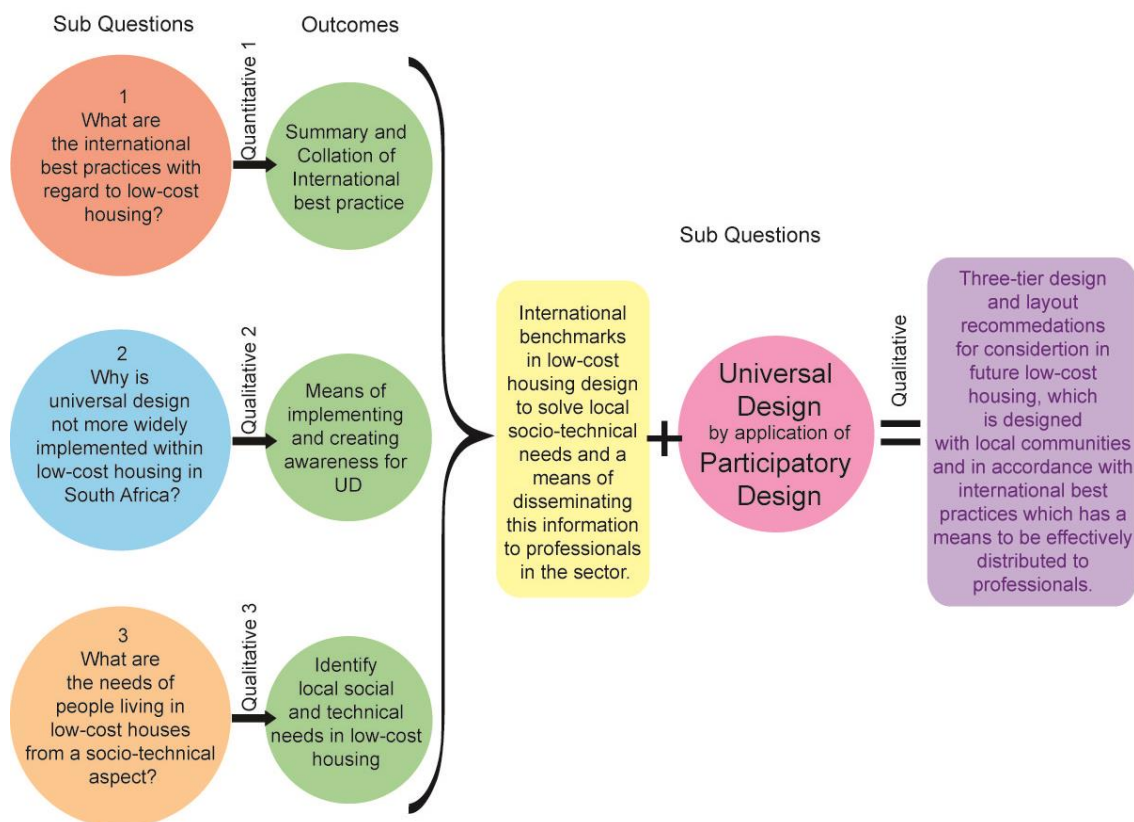


Figure 3.1: Proposed research design methodology to indicate the research methodology that was intended to be used to achieve the proposed research outcomes (Source: Author's construct, 2015).

The figure above serves to illustrate the relation between the sub-questions, the outcomes based on areas in which research was essential, how the results of the different sub-questions were then analysed through UA and PD, for which the result was a three-tier list of design recommendations.

The three-tier set of design recommendations: the first is essential to meeting socio-technical needs in the home; the second encompasses the same needs but from within the immediate precinct and the third tier consists of added benefits to communities and the potential for further economic growth.

The research design as illustrated above was adapted as the various limitations for the research became more evident, the following section describes the research methodology as it was conducted for this research, as well as provides a more detailed overview of the research questions and detailed methodology for each.

3.4 Research Methodology

3.4.1 What are the International Best Practices with regard to Low-cost Housing?

Desktop research included internet searches on the latest international and local developments in the construction industry, with regard to low-cost housing developments, as well as what practices were being put in place to solve housing backlogs in a more sustainable manner. Research also involved published works, including the *Sustainable Neighbourhood Design Manual: A Non-Technical Guide* edited by L. Thompson-Smeddle (2009), tender requirements for local low-cost housing, numerous local case studies through the assistance of the Development Action Group (DAG), as well as online articles and visual information from photographs with regard to international best practices. The aim of this desktop research was to identify possible developments in design that could be applicable to the low-cost housing industry within Cape Town, South Africa, as well as to define the physical design limitations of local low-cost housing in terms of physical parameters. It was proposed that information on the empirical values of the current low-cost houses was to be sourced from the Sustainability Institute in Stellenbosch, Cape Town, and compared to the ideal quantities and costs, in the hope of creating a potentially healthier and happier environment by means of construction and design. The information that was gained from the Sustainability Institute in Stellenbosch proved to be related to shack housing, however, and was therefore not directly relevant to this research and thus not included in the findings.

3.4.2 Why is Universal Design not more widely implemented within Low-cost Housing in South Africa?

The research in this regard was conducted through scheduled, semi-structured interviews, which were conducted with people who are either directly or indirectly involved in UD, Architecture, Social Housing or Education. When face-to-face interviews could not be conducted, email correspondence was used; the information collected from both approaches is in the possession of the researcher. The aim of the face-to-face and email interviews was to identify what the current application of UD was in the professional sector in South Africa. An investigation was conducted into why professionals do not use South African Standards (SANS 10400 Part-S of 2011- Third Edition), which is related to certain aspects of UD in the building industry, during the design and construction phases of housing and what their reservations on the further implementation of it were.

During the interviews and discussions questions arose regarding the reasons for not implementing UD. The discussions around what could be achieved in the future in terms of low-cost housing being universally accessible and how professionals would like to see it regulated, led to the identification of various possible implementations; these in turn could lead to the standardisation of the implementation of UD in community (housing) design.

Research was also conducted into regulations for the architectural profession in South Africa, such as the National Building Regulations (specifically SANS 10400 Part S, which directly relates to access to built environments by all people) and the United Nations' MDGs to aid in the further justification of the implementation of UD within the low-cost housing sector.

3.4.3 What are the Needs of People living in Low-cost Houses from a Socio-technical Perspective?

In accordance with qualitative research principles, data was collected from informants on the then current conditions of the houses and the modifications that occupants of low-cost houses had made in attempts to make their houses more accessible. It was proposed that the research was to be conducted through verbal interviews but due to circumstances beyond the researcher's control, access to focus groups of people living in low-cost houses in the N2 Gateway area (or even through the Violence Prevention through Urban Upgrading [VPUU] project, based in Khayelitsha in Cape Town) was not possible due to political instability within the communities leading up to the upcoming elections. Instead, it was decided to evaluate data from desktop research and onsite audits of housing developments to identify the needs, as well as to consult with representatives of the research group in the form of professionals, to solicit from their experience what the needs are.

Also included in this section of research were onsite observations of the several current low-cost housing developments. The configurations of the houses were audited: this was conducted by comparing the current infrastructure and environment with UD-based best practices from around the world, a process that was validated by Phillip Thompson from IDC Consultants, an internationally renowned universal access consulting company. Although access to the communities to conduct the audit was restricted, the researcher managed to gain access to a few housing developments in order to obtain a better sample of the houses that had been developed for low-cost housing schemes. The results were recorded in the form of detailed notes in a checklist type of format, which included photographs (with the consent of the home owners).

Desktop research was also conducted into ways of designing for a better sense of community, safety, security and camaraderie within the low-cost housing sector. This research defined the metaphysical space of a home and how people could be encouraged to take ownership of their homes, in terms of converting a house into a home.

3.4.4 How can Universal Design, informed by Participatory Design, better address the Socio-technical Needs of People living in Low-cost Houses?

The researcher attempted to gain access to residents in the N2 Gateway area as well as the VPUU in Khayelitsha, but was unsuccessful, due to political volatility in those areas. As the proposed research group that was to be formed by people living in the identified low-cost housing developments, was thus not accessible to the researcher, it was decided to assemble individuals from the professional sector into a research group. The purpose of involving the professional sector in the PD process was to draw on their experience of working within low-cost housing developments and communities in order to identify the key social and technical issues that could be addressed in the process of re-designing such houses in accordance with UD and PD principles.

By using an iterative process, the results from discussions with the professional sector were distilled and presented to people living in the low-cost housing developments for verification. This produced a comprehensive list of design recommendations for more accessible and socially responsive housing development, addressing both social and technical issues. The final design recommendations, which emerged as a result of the processes of engagement as indicated above, were the basic design that would inform the standard design interventions for possible future housing developments. The three-tier list of recommendations, suggested for implementation, starts with the individual home, and then

expands to include the precinct and the surrounding community, in order to accommodate the diverse human needs within housing developments.

The proposed research methodology was illustrated in Figure 3.1, but, as the research process developed, the methodology was adapted; the more accurate research approach is illustrated below in Figure 3.2.

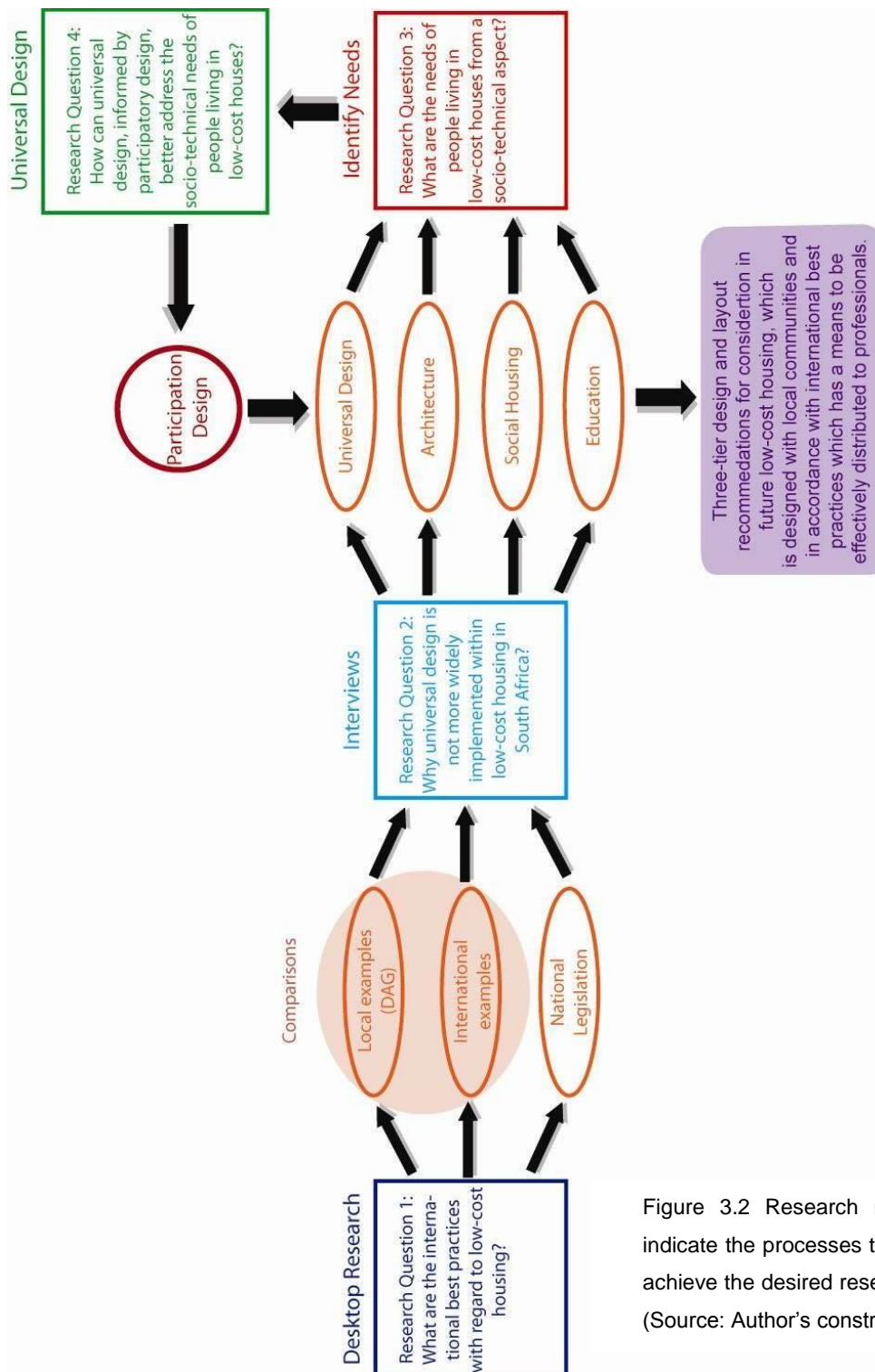


Figure 3.2 Research methodology to indicate the processes that was used to achieve the desired research outcomes. (Source: Author's construct)

This research methodology allowed for first research question to influence the second and the second to influence the third, and so on, which resulted in more distilled research results. As has been emphasised throughout the beginning sections and chapters of this research, PD is a vital component of UD and therefore the following section focuses on the participants that informed the research and therefore the results and findings.

3.5 Research Participants

In order to provide a proper context for the research, two sample areas were chosen. The first sample area was as a top level approach, where a collection of professionals were sourced, based on their interests and areas of expertise. The second was a grassroots level sample, based on participatory interventions, such as interview questions, which consisted of individuals that were interviewed through the UD Audits that were conducted on the different housing developments.

3.5.1 Professional Sector

It is essential to gather information from all levels of intervention within the housing scheme, namely, UD, construction, architecture and planning. Some of the interviewees were also selected based on previous work in either the housing sector or an interest in housing or related community areas. The results of the interviews in the professional sector are tabulated in Chapter 4: Results and Discussion, section 4.3.

Interviews were scheduled both electronically (by email) and telephonically; the interviews were conducted in person wherever possible, and over email where the interviewees were unable to schedule a face-to-face interview. The information was audio recorded and transcribed or saved in email format for record keeping and referral.

Consent was obtained from participants to their names being used as a reference in this research; an alias was used for participants who requested anonymity.

Participants were:

- Phillip Thompson – Architect and Universal Access Auditor: Universal Access clients include: Sun International Hotels, SOLIDERE and City of Beirut, Golden Arrow Bus Services, Waterfront Holding and Development Companies, Prince Salman Centre for Disability Research, Kerzner International, National Building Regulations SANS 10400 Advisory Committee, Prince Salman Centre for Disability Research, Gautrain, 2010 World Cup Stadia and PRASA (IDC Consultants, 2012)
- Susan Coetzee (alias) – Professional Architect

- Helen MacGregor – Development Action Group (DAG): “a leading NGO in the urban sector, [DAG] was established in 1986. We work closely with citizens, civil society organisations and government to address emerging urban challenges and we are highly committed to a partnership model of intervention that favours a pro poor agenda. Since 2010 DAG has been aligning its programmes, projects and interventions around the theme of ‘re-imagining the city’ and looking towards a ‘new urban order in the South African context’, while, at the same time, consolidating our traditional role of facilitating access to affordable housing opportunities.” (DAG, Unknown date)
- Astrid Wicht – Architect and community development facilitator
- Andy Bolnick – Founder and driver of Ikhayalami. “Ikhayalami is a Not For Profit Organisation whose primary aim is to develop and implement affordable technical solutions for Informal Settlement Upgrading.” “Ikhayalami’s areas of focus include: research and development, upgrading of shelters, infrastructural development, community facilities, blocking-out (reconfiguring settlement wide layouts), disaster response and sales to the public to reach more people and lead to sustainability.” (Ikhayalami, 2012)

3.5.2 Community Participation

In the proposed research, the extent to which participation was anticipated was comparable to Typology number 6: Interactive Participation (see Table 6 below), in that the extent of the participation was expected to be fairly active. However, due to limited access to the focus groups, as a result of volatile community environments, the level of participation was actually more in line with Typology number 3: Participation by Consultation (see Table 6 below), which is a more passive means of participation.

The alteration in the level or typology of participation was due to restricted access to the communities; three local low-cost housing developments were engaged and the purpose of the research was to conduct a housing audit, which was reviewed by IDC Consultants of Cape Town.

According to Davids et al. (2005: 113), “public participation has become a buzz word, adding to the growing family of development jargon”. As the definition of public participation is largely subject to the context, the following “typologies” for public participation have been developed to define and clarify the different levels of public participation. The seven typologies of PD are most applicable to this research and defined below, in Table 6:

Table 6: The seven typologies of public participation (from Davids et al., 2005: 114-116).

Seven Typologies of Public Participation
1. Passive Participation: People “participate” by being told what is going to happen or has already happened. “Participation” relates to a unilateral top-down announcement by the authority or project manager. Information being shared belongs to outsiders and/or professionals.
2. Participation in Information Giving: People “participate” by answering questions posed in questionnaires or telephone interviews or similar “public participation” strategies. The public do not have the opportunity to influence proceedings, as the findings of the research are neither shared nor evaluated for accuracy.
3. Participation by Consultation: People “participate” by being consulted, as professionals, consultants and planners listen to their views. The professionals define both the problems and the solutions and modify these in the light of the people’s responses. This process does not include any share in decision making by the public, nor are the professionals under any obligation to consider the public’s views.
4. Participation for Material Incentives: People “participate” by providing resources, such as labour, in return for food and cash. This typology typically takes place in rural environments, where, for example, farmers provide the fields but are not involved in the experiment or learning process. The people have no stake in prolonging the activities when the incentives end.
5. Functional Participation: People “participate” in a group context to meet predetermined objectives related to the project, which may involve the development or promotion of externally initiated social organisations. This type of involvement tends not to occur at the early stages of project cycles or planning, but rather only once the important decisions have already been made.
6. Interactive Participation: People “participate” in a joint analysis, the development of action plans and capacity building. Participation is seen as a right, not just a means to achieve project goals.
7. Self-mobilisation: People “participate” by taking initiatives independent of external institutions to change systems. This bottom-up approach allows people to develop contacts with external institutions for resources and the technical advice they need, but they themselves retain control over how resources are used.

As participation from the residents of low-cost housing developments was restricted, the research changed its participation focus area to professionals who regularly engage in PD on an active level (Typologies 6 and 7 as indicated above). The professional sector was drawn on to engage in the research to get an understanding of what the needs of people in low-cost housing communities are, creating a representation of the target group. It would have been preferable to engage with the target group directly, namely, the people actually living in the low-cost housing communities, and it is therefore recommended that future research directly involve this target group through active PD (Typologies 6 and 7 as indicated above).

In all areas of research that involve people, certain considerations need to be made to respect the people involved, and having reviewed the groups of people that were involved and to what extent, the following section focuses on the ethical considerations of the research.

3.6 Ethical Considerations

As interviews with people at the grassroots level was not possible due to the lack of access to the groups as well as the political volatility in the identified areas, the only interviews that were conducted were with the professionals in the various fields applicable to this research. The researcher therefore did not face any ethical restrictions with regard to the gaining of insights from the interviewees. The researcher did, for legal purposes, request that, where applicable, the interviewees completed the information consent form.

In cases where telephonic interview were held, verbal permission was requested for the use of the information disseminated during the conversation. Where interview were recorded, interviewees were asked to sign an Information Consent form.

All signed consent forms are in the possession of the author and a blank consent form has been attached as Appendix C: Information Consent Form.

Having looked that people involved in the research and the associated ethical considerations, we now look at how the housing developments were reviewed and the tool that was developed specifically for this purpose.

3.7 Measures and Analysis

3.7.1 Means of Quantification of Housing Development Research

The examples that have been selected have been reviewed according to a set of requirements that, collectively, according to this research, defines the long-term success of a housing development. These criteria are based on the following four main aspects (divided into quadrants) of low-cost housing:

1. The application of UD – the reasoning for this forming a quadrant of the measure and analysis tool is that UD and its application are the central topic of this research. The more UD has been considered in the design itself and in the design process, the better the housing development will be able to meet the needs of the community. UD should form the base according to which all low-cost housing communities are designed.
2. The application of PD – this is the methodology through which communities should be engaged with regarding housing developments that are to be constructed. PD forms an essential component for any development, as it underlies all engagement with the community for whom the houses are being designed and constructed. In order to

create a community where residents take ownership of the area, PD needs to be at the forefront of planning and development of the housing.

3. Construction – given the prevalence of poor quality houses and related problems associated with the construction of low-cost housing, the construction of new housing developments should emphasise the importance of well-constructed houses and surrounding infrastructure. It is a human right to have access to adequate shelter, which should be provided through quality construction.
4. Consideration for sustainability – housing developments were initially developed as a short-term solution, while people in communities were waiting for permanent houses; however, due to excessive lead times, poor construction, land sprawl and escalating costs, low-cost housing is now a permanent housing installation. Therefore the developments need to be sustainable, in terms of the offering for the residents as well as for the construction and design teams.

Each of the four aspects mentioned above was graded on a sliding scale out of 7, with 1 indicating that the aspect has very little to no impact on the specific housing development, and 7 indicating that the aspect has had the maximum impact on the development. The aspects chosen to be representative of successful housing developments were briefly introduced in Chapter 1, Section 1.3 Contextualising the Housing Imperative, which formed part of the introduction to the problems of social housing.

Each aspect's sliding scale is defined and categorised below in Table 7.

Table 7: Scale definitions for the main aspects of the measuring tool that was developed as an outcome of the research in order to compare various international and local examples of housing developments (Author's construct, 2015).

	Universal Design	Participatory Design	Construction	Sustainability
Scale	The scale used to define the impact that UD has had on the housing development is extracted from the User Population pyramid ¹ as illustrated in Chapter 2, Section 2.5.5 Beneficiaries of UD	The scale used to define the degree to which the community was involved in the housing process through Participatory Design is defined by the Typologies as detailed in Chapter 3, Section 3.6 Community Participation	Due to the excessive number of houses on the backlog list, developments of 100 houses or more are considered an excellent quantity, which in conjunction with the quality of the houses, including material choices, inform the sliding scale for construction.	The scale for sustainability is not measurable in subsequent intervals, but rather as separate items that add numbers to the scale reading. Each item listed as a number would contribute one number to the scale reading. Items under sustainability are both ecological and economic.
1	Only accommodates the “fit and agile” (Row 1)	People were told what is going to happen or what has already happened (Passive Participation)	50 houses or less of an acceptable quality*	Access to public transport systems Community orientated facilities.
2	Designed for the “able-bodied” (Row 2)	Public participation with no influence (Participation in Information Giving)	51 to 99 houses of an acceptable quality*	Interventions to reduce electricity use and cost
3	Accommodates women and children (Row 3)	People offer comments with no tangible input (Participation by Consultation)	100 or more houses of an acceptable quality*	Interventions to save and reduce water usage
4	Accommodates the elderly as well as people with prams (Row 4)	People provide resources for stipend (Participation for Material Incentives)	50 houses or less of exceptional quality**	Sustainable construction in terms of orientation, design and materials used

¹ The Population pyramid has 8 rows, but as the scale as defined for Participatory Design has 7 well defined and detailed sections, the last two rows of the pyramid have been condensed into the last section, as the requirements are most similar.

5	Design accommodates people with assistive devices and walking aids (Row 5)	Participation to meet predetermined objectives (Functional Participation)	Between 51 and 99 houses of exceptional quality**	Waste disposal infrastructure and recycling facilities. Medium density living.
6	Design accommodates independent wheelchair users (Row 6)	Analysis and development of action plans and capacity building (Interactive Participation)	100 or more houses of exceptional quality**	Ecological landscaping for growing produce and offering protection from elements of the weather.
7	Design is able to accommodate electric scooters, people who require an assistant or companion and people who require two assistants (Row 7 and 8)	Taking initiatives independent of external institutions to change systems – a complete bottom-up approach (Self-mobilisation)	100 or more houses with supporting infrastructure (schools, clinics, libraries, etc.), all of exceptional quality**	Access to economic opportunities, nearby or onsite within the housing development.

*Acceptable quality – Standard building requirements, ready for occupation without any nice-to-haves, such as painted walls, pedestrian access and parking.

**Exceptional quality - Additional nice-to-haves, including neat and tidy surroundings, painted interior and exterior walls, pedestrian access and parking.

The seven grading criteria, assigned to each of the four quadrants, can then be graphically displayed in order to draw the findings of each house as visual representation in a graph format. The criteria levels and quadrants are therefore illustrated below in Figure 3.3:

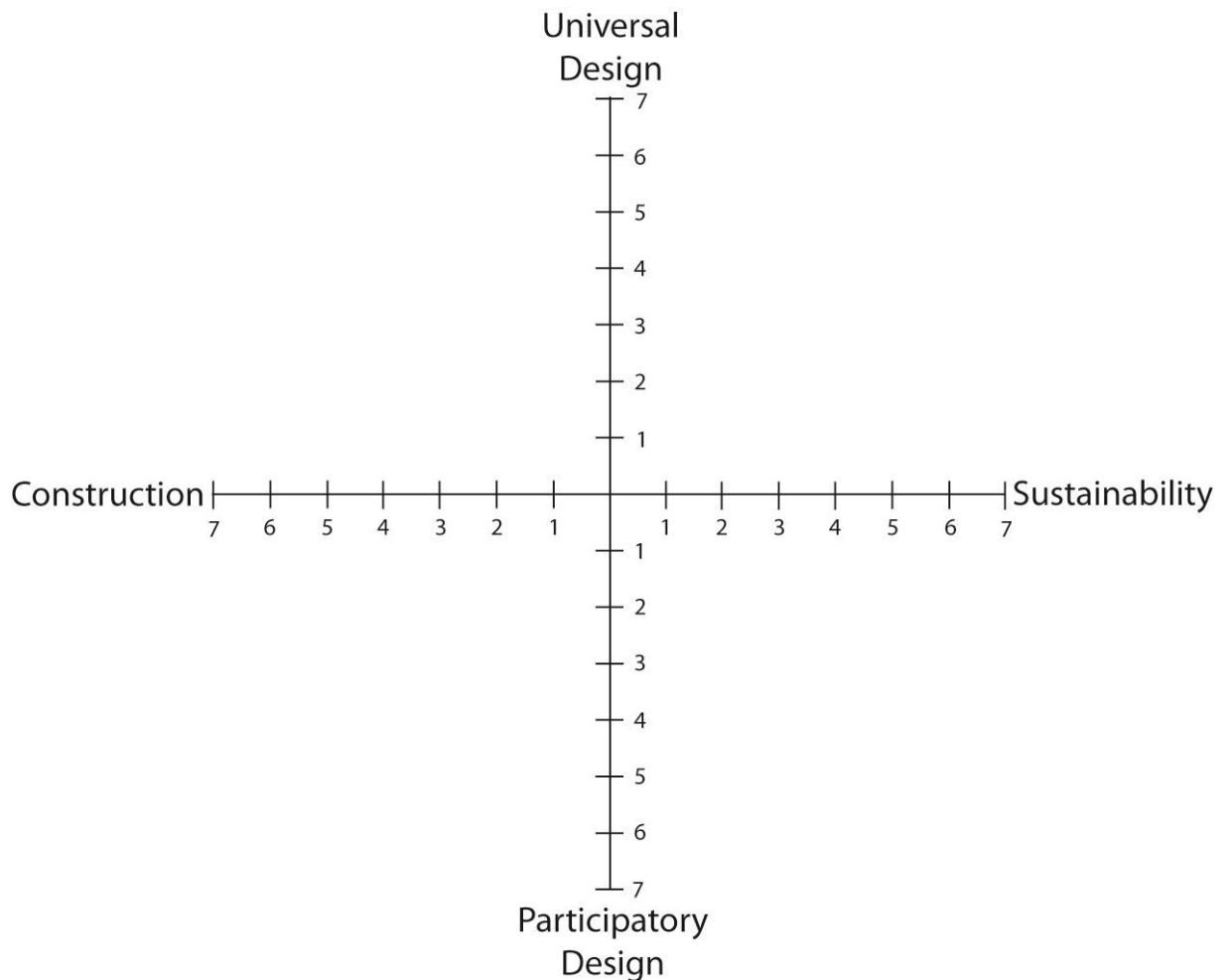


Figure 3.3: Four main criteria for the evaluation of the long-term success of low-cost housing developments, indicating the orientation of the criteria listed in Table 7 (Author's construct, 2015).

The graph as depicted above forms the bases of the review of all of the housing samples from both international and local best practices. Having introduced the tool for measure and analysis for the housing reviews, the following section introduces the interview process with the professional sector.

3.7.2 Structured Interviews

Verbal interviews with representatives from the professional sector were transcribed; both the audio recordings and the transcribed interviews are in the possession of the author, as well as any email correspondence with interviewees.

Structured interviews with the professionals contained questions that are strongly architecturally based, followed by question regarding UD/access. Typical examples of the discussion points in the structured interviews are as follows:

- Familiarity with and opinion of the South African National Standards (SANS) 10400 Part S.

- Relation of the SANS 10400 Part S to their sphere of work, how it could be implemented and what could be done to ensure adoption of the standards.
- Familiarity with and opinion of UD/Access and implementation thereof.
- Awareness of the implementation of UD in both the international and the local context.
- The promotion of UD, the local implementation of UD, who the main actors for implementation should be and which government policies would best align with the notion of UD.
- How Cape Town could champion UD, what blockages may be obstructing the broader adoption of UD, and what influences the decisions to implement it in the design process.
- Initiatives around PD, what the different outcomes are and how it influenced the design process.

A sample interview questionnaire is attached as Appendix D: Structured Interview Guidelines.

Qualitative data from the interviews has been tabulated in Chapter 4: Results and Discussion of this report; it incorporates statistical information regarding the various opinions from the interviewees, as listed in Section 3.5.1 Professional Sector. An introduction to the findings of the interviews can be found in Section 3.8 Introduction to Research Findings.

3.7.3 Universal Design Audits/Reviews

As the design processes in South Africa, specifically in the built environment, have not previously been examined from the perspective of UD, a process of UD Auditing or Reviewing was conducted locally by the researcher; this is also referred to as Access Audits or Access Reviews. An Access Review

“is a detailed analysis of the existing access of any building, site, establishment, facility, including buildings plans, blueprints and architectural drawings, etc. These audits are carried out using internationally recognised benchmarks, current building regulations, and codes of practice” (Disability Solutions, 2009).

The outcome of Access Audits/Reviews on pre-construction design

“provides an essential planning tool to be used in the pursuit of legislative requirements. The audit prevents un-strategic, ad hoc, or uninformed

attempts to addressing inaccessible environments, thus saving time and money” (Disability Solutions, 2009).

It is argued in herein that, if such reviews are conducted prior to construction and in fact during the initial design process, restricted access for some people can be prevented. If the review process is only conducted post-construction, recommendations and suggestions for achieving and improving access can be provided by experts in the field, but their implementation and degree of impact will vary in severity, depending on the structure and the use of the space that is being reviewed.

UD audits are a detailed review process, to determine the accessibility of an environment, product or service. In the situation as required of this research the built environment was the focus of the audit and therefore included aspects such as:

- Pedestrian interface
- Car parking
- External ramps
- External steps
- External circulation
- Entrances
- Internal doors
- Internal ramps
- Internal stairs
- Internal circulation
- Toilet facilities
- Internal and external surfaces
- Way finding
- Lighting

(Disability Solutions, 2009)

UD audits were conducted on an example of low-cost housing, in consultation with the home owner (see Section 3.8.2 for an introduction thereto). This process provided insight into the existing design of housing developments, and prompted several suggestions for altering the designs to accommodate people with varying abilities. This process was run in conjunction with IDC Consultants, who are international experts in the field of Access Auditing. An introduction to the findings of the access audits can be found in following section (Section 3.8 Introduction to Research Findings), while more detailed reviews of the UD audits can be found in Chapter 4: Results and Discussion below.

3.8 Introduction to Research Findings

A desktop review of international examples of low-cost housing developments revealed many of the same constraints that are faced in South Africa, in terms of housing size, project cost limitations, and lack of physical access for people with varying degrees of limitations. In some cases, there is also a lack of community participation in terms of PD, lack of access to economic opportunities and a lack of consideration for aspects pertaining to sustainability. All the international studies however indicated a focus of density as well as aesthetic design,

which is in contrast to what is generally found in the South African context. All of the international and local housing reviews are represented in graph format, as indicated in Chapter 3, Section 3.7 Measures and Analysis of this report.

3.8.1 Internal and Local Housing Development Comparisons

International studies were based on the Box House by Yuri Vital (Sao Paulo, Brazil), Social Housing by Dosmasuno Arquitectos (Madrid, Spain), and Quinta Monroy (Iquique, Chile) and Monterrey Housing (Monterrey, Mexico) by Elemental.



Figure 3.4: Image of Box Houses in São Paulo, Brazil by Yuri Vital. (Damen, 2009)



Figure 3.5: Images of the Social Housing developments in Madrid, Spain by Dosmasuno Arquitectos, photos by Miguel de Guzmán. (Chahine, 2011)



Figure 3.6: Final construction of the social housing in Chile, by Elemental, where the climate is desert like. (ArchDaily, 2008)



Figure 3.7: Final construction of low-cost housing in Mexico by Elemental. Photos by Ramiro Ramirez (Bustler, 2010)

Local research on housing generally demonstrated the lack of densification and visual appeal and indicated a desire from people being housed to have a plot of land with one housing unit; this unfortunately places a greater strain on services (water, electricity, rubbish removal and sewage) as well as increasing the cost per housing unit. The local housing developments studies were based on PELIP Housing by Noero Wolff Architects (Red Location, Port

Elizabeth, South Africa), Marconi Beam Affordable Housing Project (Joe Slovo Park, Milnerton, Cape Town, South Africa), Freedom Park Informal Settlement Upgrade (Mitchells Plain, Cape Town, South Africa) and Netreg Housing Project (Netreg, Cape Town, South Africa), all by the Development Action Group (DAG).



Figure 3.8: Social housing development in Port Elizabeth (Red Location), South Africa by Wolff Architects and the NGO, PELIP Housing Company. Photos by H. Wolff. (Noero Wolff Architects, 2011)



Figure 3.9: Marconi Beam also known as Joe Slovo Park is located near Milnerton, Cape Town. Photo by Andrea Couvert. (Haysom, 2009: 1)



Figure 3.10: Freedom Park Informal Settlement Upgrade project by DAG. Photo by Andrea Couvert. (DAG, 2009: 1)



Figure 3.11: Netreg Housing Project by DAG in Cape Town. (Torkelson, 2009: 22)

The application of UD within the local low-cost housing sector is not unheard of, specifically in relation to the City of Cape Town, who have included, on their application forms for housing, questions related to types of limitations as well as the required aids. A copy of this application form is attached in Appendix E: Copy of application form for listing of the City of Cape Town Housing Database. Although the question pertaining to the requirements for specific needs, as contained in the questionnaire, is a step in the right direction of acknowledging diversity, it is questionable that this questionnaire actually has an impact on the design and construction process.

PD was used both during the review of the houses in low-cost housing developments as well as during engagements with the professional sector in order to gain insight into the processes of housing development. The professional sector highlighted certain problems that they had encountered and their experiences with housing developments; these findings led to a better understanding of the processes around the development of low-cost housing, specifically in Cape Town. They included aspects such as house size being an indicator of status in the community, of hierarchy existing amongst community members, and of the fact that construction in the existing areas must take flood plains into account.

The emphasis on sustainability with regard to low-cost housing is also not a new development and has been referred to in various pieces of South African legislation, including in the New Housing Policy and Strategy for South Africa (South Africa, 1994b: 11-58), The Housing Act (South Africa, 1997b: 5-7) as well as the most recent BNG policy (dated August 2004). However, examples of the implementation thereof are not readily found. According to Thompson-Smeddle and Roux (2009: 1) in *The Sustainable Neighbourhood Design Manual: A Non-Technical Guide by The Sustainability Institute in Cape Town*,

“this is primarily due to the continued predominance of old approaches to township planning, infrastructure and housing design, and a lack of cross-sector integration and collaboration. Planners seldom design neighbourhoods with a view to their long-term environmental, social and economic sustainability, and apartheid spatial constructs and financial constraints mostly overrule integrated approaches to holistically designed settlements.”

By incorporating essential and cost-effective technical specifications for sustainable living into the list of recommendations for consideration in future designs of low-cost housing developments, a more sustainable means of housing could be developed. These include recycling initiatives, solar water heating, basic house orientation in relation to the sun, roof overhangs and water efficiency through rain and storm water collection and retention.

The “old approaches” and the more traditional means of construction are perpetuating and exacerbating the current situation with regard to the housing backlog and the construction of inferior quality houses. In searching for alternative means of construction, this research has identified two alternative types of construction. Firstly, the locally developed Moladi Construction process consists of putting up a plastic mould onsite and filling the mould with a pre-formulated concrete mix (Moladi Construction, 2014). Secondly, using a similar process although it involves the construction of the units off-site or at a factory, precast housing units

are then transported to the building site and then installed (Fitzhenry, 2010). Both processes claim that they are able to *complete* one house every 24 hours. In this research, and for two reasons, more emphasis has been placed on the latter of the two methods. Firstly, the researcher had access to direct information from the constructors and developers of the Fitzhenry process; secondly, the Moladi method of construction only applies to single unit developments and, since densification of housing developments has been strongly recommended in the international examples, it means that the Moladi method is less suitable than the Fitzhenry construction method. This process is reviewed in more detail in Chapter 4: Results and Discussion, in Section 4.2.3: Comparison and Discussion of Findings on Best Practices.

The tender document that was reviewed as part of this research indicated that the means of construction itself is not specified in the tender requirements. Instead, an emphasis was placed on job creation during the construction phase as well as on up-skilling people from the community (City of Cape Town, 2006). The tender was published in early 2006 and covered the construction of 1648 houses in the Tafelsig and Eastridge areas (Freedom Park, Tafelsig, Eastridge and Mitchell's Plain), whose general area is indicated in Figure 3.12 below.

The local publication of housing tenders has been placed on hold due to the reconfiguration and re-specification that is required for new tenders subsequent to the publication of the BNG. The tender that is part of this review process is one of the most recent tender documents that are available for review for research purposes.

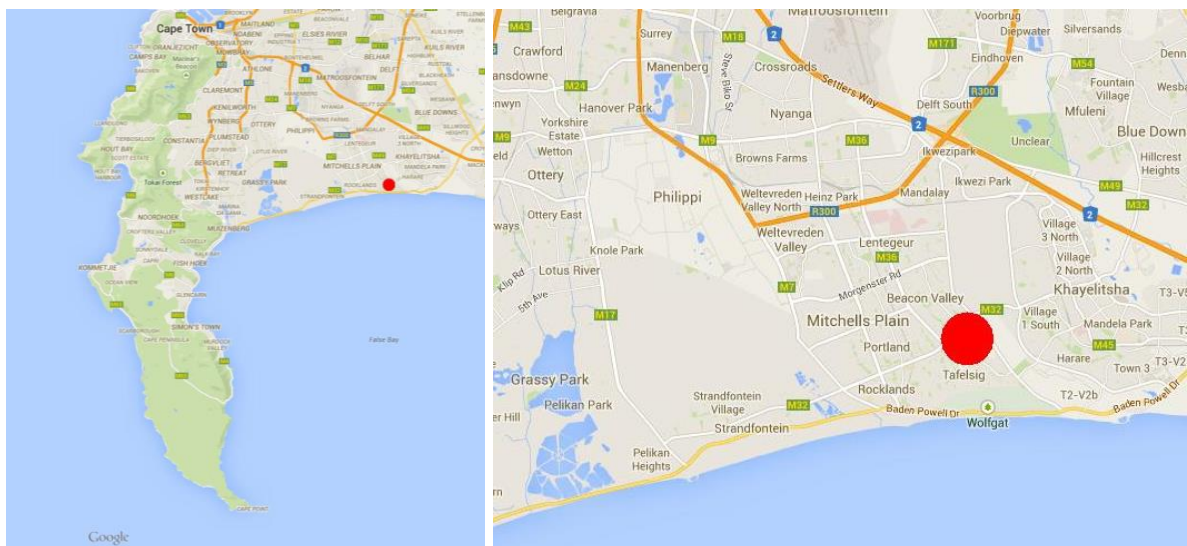


Figure 3.12: Location for which the tender, which was reviewed as part this research, was required (Author's construct via Google Maps, 2015).

The tender was put out for the

“construction of a total of 1648 single storey houses and outside works on erven on contract sites, which have been fully serviced to normal township standards complete with foul sewers including connections from plot boundaries to main reticulation, stormwater drainage, potable water supplies, including connections from plot boundaries to main reticulation, premix surface roads and electrical reticulation” (City of Cape Town, 2006: 34).

Of the total number of 1648 beneficiaries, 12% (amounting to 198 households) opted to build their own homes through the PHP process; these needed to be constructed within the prescribed contract period (City of Cape Town, 2006: 34). Community engagement during the contract period for the tender was emphasised throughout the tender requirements, but there was no consideration, in the tender itself, for ease of access or UD, sustainability or even construction, apart from the methods of construction having to meet the specified sets of building regulations.

In light of the South African Constitution, by not designing with UD in mind, a case could be made for the infringement of human rights in this tender. As UD is a method of designing for all people, by not applying it, designers, architects and builders are effectively excluding people of different abilities from everyday life (including low-cost housing). It has become apparent that, even though equality is the basis of the South African Constitution, very few people are aware of, or familiar with, the fact that people can have different abilities throughout the various stages of life (so not just people with permanent disabilities, but people with temporary disabilities as well; associated with particular stages of life, or illness, etc.) Life-span design is a term not often used in the housing sector but it *is* more frequently used and is more easily understood than UD. Part S (2011) of the National Building Regulations specifies basic implementations for accommodating users with various functional limitations, including the elderly and young children, and although these are not ideal UD requirements, they serve as a starting point for life-span architecture, which in turn serves our human rights. As importantly, as part of the Universal Declaration of Human Rights, we (as a country) have, by proxy, undertaken to promote, respect and secure basic human rights.

Interviewees were selected from a range of occupations; each specialised in one or more of the areas that form the crux of this research, namely, UD, low-cost housing, and architecture. An outline of the professions as well as the areas of specialisation of the interviewees can be found in Table 8 below. The overall findings from the interviews with the professional bodies

indicated that the awareness of UD and its benefits is lacking in sectors related to low-cost housing. It also became apparent that the policies that inform changes to the developments within our country are generally a guideline, largely due to a lack of consequence if they are not applied (Fransolet & Coetzee, 2013), and that effective change is best applied through the masses who are affected by the proposed change (Fransolet & Bolnick, 2014; Fransolet & MacGregor, 2014). This change also requires a person to champion or pioneer the process, who has a passion for the people that are involved and is not necessarily influenced by legislation (Fransolet & Bolnick, 2014; Fransolet & Wicht, 2014).

Table 8: List of professional interviewees, indicating their areas of specialisation (Author's construct, 2015).

Interviewee	Occupation	Universal Design	Low-cost housing	Architecture
Phillip Thompson	Architect	✓		✓
Susan Coetzee	Architect			✓
Helen MacGregor	Social Housing		✓	
Astrid Wicht	Community Development Facilitator		✓	✓
Andy Bolnick	Social Housing		✓	

With local legislation, such as SANS 10400 Part S, undergoing alterations and reviews to better inform people about design decisions that result in accessible environments for all users and people, as well as with reference to the South African Constitution and the United Nations' MDGs, it is clear that UD should be more strongly advocated, with more stringent consequences for non-compliance with basic requirements. But this task would have to fall to a separate body, external both to government and to contractors, and it should be accountable to the people who would actually benefit from UD.

To illustrate the elements that are covered within the current building regulations, specifically Part S of SANS 10400, which relates to access to facilities for people with disabilities, a universal access audit was conducted of several low-cost housing developments on the outskirts of Cape Town. The aim was to gain an understanding of what has been provided in terms of low-cost housing developments, and to gain insight into the needs of the people living in these developments. The first housing development / house reviewed was constructed prior to 2004 and the drafting of the BNG policy; this gives a base line of what was provided by government prior to changes in legislation. Two housing developments, one from 2013 and one from 2014, were then reviewed to ascertain what has been provided after the passing of the BNG policy. Lastly, a more recent low-cost housing development was

reviewed to determine the potential for low-cost housing in future developments, based on new means of UD-informed design and construction.

3.8.2 UD Audits on local houses

Introduction to Review of House constructed prior to 2004



Figure 3.13: “RDP” house located in Macassar on the outskirts of Cape Town. (Fransolet, 2014)

The plot on which the house is situated is approximately 160m² in size, while the house takes up a mere total of 36m². This house is home to a family of six, which includes two children under the age of six years, and has additional backyard dwellings, built on the land to accommodate ten extended family members. Physical access to the property is restricted and the lack of pedestrian infrastructure and internal circulation is also restricted, due to the limited internal space that is available. There is no access to public

transport due to the configuration of the roads in the surrounding area. Some of the homes in the area have been converted into preschool facilities or small corner shops.

Introduction to Review of Houses constructed in 2013



Figure 3.14: Social housing located in Flamingo Vlei, along the M3, Cape Town. (Fransolet, 2014)

The house is 46m² in size, with a large common area behind the house. At the front of the houses, there are dedicated parking/taxi loading areas/bus stops. The backyard area is left sandy, as is the area in front of the house, as illustrated in the image; the backyard area is left for the inhabitants to finish. The community watch keeps a close eye on these properties to prevent extensions to houses, as well as to monitor crime and suspicious behaviour within the

newly established community. The house that was reviewed is home to four adults and one small child and, due to the complexities of the relocation process, the remaining family members are still located in the informal settlements about 10km away from Flamingo Vlei.

Physical access to the houses for people with disabilities is restricted because the doorways are too narrow, and because there are steps at the front and back entrance of each house.

Introduction to Review of Houses constructed in 2014



Figure 3.15: Social housing located in Ocean View. (Fransolet, 2014)

The architect who designed these housing units felt that it was important for the low-cost housing to be aesthetically pleasing. He achieved this by using stone facades. These two-bedroom houses are 44m² in size; the total building site consists of 530 houses, of which three were to be constructed as houses for people with disabilities; however, the

layout and configuration of all the houses were all exactly the same and not accessible or compliant with SANS 10400 Part S (2011)

which deals specifically with Facilities for People with Disabilities. The three accessible houses were located in a cluster at the bottom of the housing development, which is located on a slope, so that the people living there would be closer to transport facilities. Each house is home to typically 6 people from the neighbouring informal settlement.

When the above low-cost houses are compared with the statements of the John S. and James L. Knight Foundation (2010: 10) (which is discussed in detail in Section 2.7.2 Creating a Home), namely, that the most influential factors in creating emotional connections to people's own communities are things such as social offerings, openness of the area and its aesthetics, it is clear that the local examples fall short. Even a superficial review, as illustrated above, demonstrates a lack of all three of these motivating factors, with regard to creating an emotional connection to these communities. It is the contention of this thesis that, based on the socio-technical needs of people living in these low-cost housing developments and the three top-rated factors from the John S. and James L. Knight Foundation (2010: 10), it is possible to arrive at a better understanding of creating a new community.

Introduction to Review of Alternative Construction Technology



Figure 3.16: Student Residents in Mowbray, Cape Town, which has been constructed with modular, precast 'building blocks'. (Fransolet, 2014)

An alternative construction technology is the use of a completed precast modular system that has been adopted locally for large-scale housing developments. Each cast can contain electrical fittings, plumbing and designated spaces for window and door fittings. The earliest example of similar construction methods was found in Australia, and appears to have been developed in 1997. Apart from its *ad hoc* application in the low-cost housing sector locally, a student residence was

constructed in Mowbray, Cape Town in 2010.

Two forms of modular precast construction have been used locally. The first is an onsite system, where a precast concrete mix is poured into a mould and allowed to set for 24 hrs. The second is where the modular cast is manufactured offsite and the cast units are then transported to the site and placed in their predetermined locations. The example in Figure 3.16 shows the latter method of construction. In both instances, the manufacturers assert that each 'building block' or cast can be manufactured in 24 hours. The moulds vary in size, which is generally determined by the design and specific requirements; they are also limited in size by the limitation of the physical properties of the concrete mixture. This modular system allows the space to be maximised; in this particular example, space has also been allocated to the installation of a lift, accessible underground parking, a social quad area in the centre of the building, a communal area for washing clothes and an internet and cafeteria area (Fitzhenry, 2010).

When the above housing scheme is compared with the findings of the John S. and James L. Knight Foundation (2010: 10) with regard to the factors that are the most influential in creating emotional connections between people and their own communities, this new development offers all three: social offerings, openness and aesthetics. By implication, it would thus be easier for the residents in this housing development to take ownership of their home. Moreover, the development is centrally located within the southern suburbs of Cape Town and is well serviced by the bus terminal and taxi rank on the opposite side of the road, further increasing access to economic opportunities for residents.

The findings of the international and local examples, as well as the reviews as listed above, in conjunction with the interviews with the professionals, it was possible to start formulating the findings into a list of recommendations for consideration into future housing developments. The list of recommendations has been broken down into three areas of application to better demonstrate the scale of the various recommendations. These areas, namely, Home, Precinct and Community, indicate where the recommendations are applicable within the design process, based on findings from interviews and the Universal Access Audits that were conducted on the houses and housing developments. The following section serves as an introduction to the findings, which are derived from the identified socio-technical needs.

3.9 Presentation of Findings

Throughout the research stages of this report, information and findings were systematically screened, compiled and edited, as progress was made. Quantitative research has led to the calculation of percentages for reporting purposes, and all related information, wherever possible or feasible, was attached in the Appendices.

The aim of the study was to compile a three-tier list of recommendations for consideration in the future design and construction of low-cost housing projects in Cape Town, South Africa. This three-tier list of recommendations looks at three specific areas of application, as suggested by Andy Bolnick (see Figure 3.17 below), namely, the home environment, the immediate precinct, and the surrounding community (Fransolet & Bolnick, 2014). This allows for a more holistic approach and prevents accessible houses from being constructed in isolation, which is currently the reality. The complete list of recommendations can be found in Chapter 4: Results and Discussion.

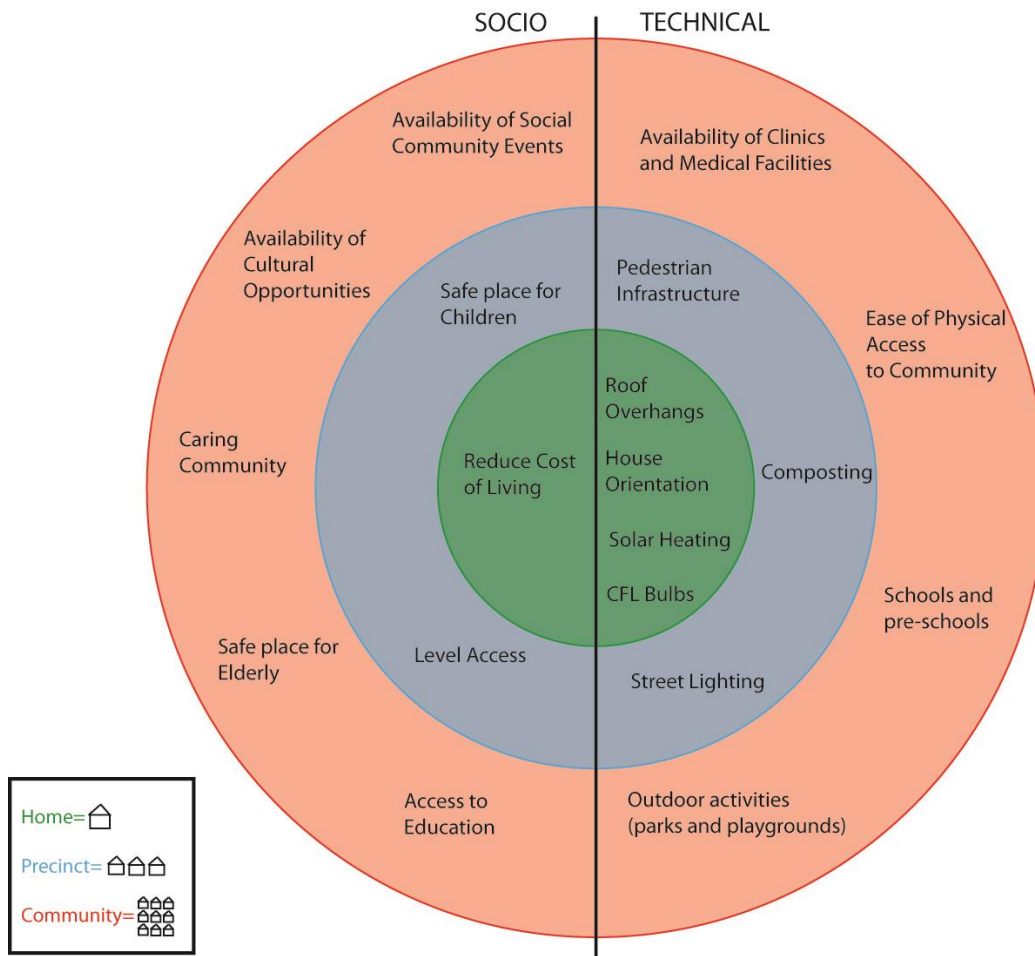


Figure 3.17: List of requirements generated by the research on local and international housing developments, including onsite research and desktop research, and categorised according to area of application, namely, Home, Precinct or Community. (Author's construct, 2014)

This overview of the research findings which is categorised into three areas of application as illustrated above, simplifies the application of the design interventions required to over the socio-technical needs that were identified during the research. All the areas of research leading to this list of recommendations, as well as the processes that have been undertaken is summarised below.

3.10 Summary

The methodology as presented in this chapter is a more refined version of the originally proposed methodology, and deals more specifically and succinctly with the topics that required investigation as well as including the limitations that only became apparent during the commencement of information gathering. This includes the development of a required tool in order to conduct objective comparisons of international and local examples of low-cost

housing, as well as the decision to limit the number of professionals interviewed in the various sectors, namely UD, social housing and architecture (specifically dealing with low-cost housing).

The interviews with the professionals identified the need for the application of UD at various levels within the low-cost housing sector, namely within the home, the surrounding precinct and throughout the surrounding community. This important insight influenced the manner in which the three-tier list of recommendations was written, because the tiers were initially thought to be categorised according to priority; however, once UD was categorised as the priority, the tiers were instead defined according to areas of application (home, precinct and community).

The tool that was designed for the objective reviews of international and local examples of low-cost housing developments, took into account four of the most prominent and applicable (in terms of the research questions) areas, as highlighted in the problem description in Chapter 1. The tool uses a scale from 1 to 7, with 1 indicating minimum requirements and 7 ultimate achievements. The first area of review was therefore the extent to which UD was applied, which was informed by the user population pyramid, as defined in Chapter 2. The next area of review was defined as the level at which PD was engaged in, which was defined by the Seven Typologies of Public Participation (Table 6, Section 3.5.2). The third area of review was construction. Although the construction of houses could inform a very large section of this research, it was limited to achieving the required number of houses at large enough scale to minimise the housing backlog. The fourth area of review looked at sustainability, as this area was highlighted by the interviewed professionals, as well as in the literature review.

The UD audits that were conducted on the local low-cost houses indicate what has been done in the past in Cape Town, both before and after the 2004 change in regulations, which required a greater focus on social inclusion in housing developments. It was evident that not much had changed with regard to creating more socially or physically inclusive housing schemes. This finding was also supported by the requirements (or lack thereof), as stipulated in the Housing Tender document that was reviewed (the full tender is in position of the author and can be seen on request).

In this chapter, we have thus looked at how the methodology changed to lead to the findings of the research, as well as the processes that were undertaken, and the tool that was developed to quantify the results of the findings of the research. In the next chapter, the

findings will be presented and discussed in detail and will result in the three tier list of recommendations for future consideration into low-cost housing developments.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

In this chapter, the review of the various categories of housing examples is introduced by defining the optimal configuration in terms of the graph as defined in section 3.7.1 Means of Quantification of Housing Development Research, which is done in accordance with the quadrants as defined in the same section (UD, PD, Construction and Sustainability) and their respective rating systems; which is then graphically represented in Figure 4.1. International examples were taken from Brazil, Spain, Chile and Mexico, while one local example was taken from Port Elizabeth, and three examples were taken from Cape Town. Each of the examples is introduced according to the information available with regard to their development, which is followed by the author's reviews and opinions of the examples; finally, each example was reviewed by means of the tool, which has an associated text description defining the ratings. Once each example was represented by means of a graph, it was possible to compare each example with the mean, which was defined at the beginning of the relevant section.

Once all of the examples have been reviewed according to the quadrants, a table was drawn up, indicating all the ratings according to the criteria to allow for effective comparison. As this section of the research was intended to identify best practice, the housing developments that rated the highest in each sector (UD, PD, Construction and Sustainability) are briefly discussed again to highlight the reasons for them being identified as the best practice for the respective sections.

The findings from the interviews with the professionals are tabulated and discussed, and their input is used to identify and summarise the needs of people living in low-cost housing developments, as the majority of the professionals interviewed are actively involved in the communities that are served by such housing developments.

The very detailed findings from the UD Audits on local houses constructed prior to 2004, post-2004 and then in 2014 are presented and generalised at a higher level, with the detailed findings contained in the relevant Annexures and not in the chapter itself.

The analysis of the findings culminates in the compilation of a list of recommendations for future implementation within low-cost housing developments. As determined by the

interviews, each recommendation is categorized according to the area in which it would make an impact, namely the home, precinct or community. To increase the ease of legibility of the findings each category has been allocated an associated colour, namely: green for home-specific recommendations, blue for recommendations relating to the precinct areas, and red for recommendations relating to the community.

4.2 International and Local Best Practices regarding Low-cost Housing

Changing perceptions and creating better housing “cannot happen if we continue to treat people as things – as things to be relocated, or evicted, or instructed to inhabit fixed structures” (Swilling, 2007: 8).

UD, which is more often used as an add-on to the design process at the end of the project, is therefore thought not be aesthetically pleasing or adding to the overall cost of a project, but if used as a basis for the design it could have adverse effects to what has previously been considered of UD (it could be beautiful and cost efficient). “Contrary to the negative assumptions that attention to the needs of diverse users limits good design, the experience of the imaginative designers around the world reveals the range of applications that delight the senses and lift the human spirit when Universal Design is integral to the overall concept” (Preiser & Ostroff, 2001: Chapter 1.1). Similarly, the John S. and James L. Knight Foundation agree that “attachment (to homes/community) is higher when residents agree that their communities provide the social offerings and aesthetics they enjoy” (2010: 6).

The examples of international and local low-cost housing were reviewed according to the following four criteria and rated accordingly, on a scale of 1 to 7, as introduced in Chapter 3, Table 7. To reiterate briefly:

- 1. Universal Design.** The scale used to define the impact that UD has had on the housing development is extracted from the user population pyramid, as illustrated in Chapter Two, Section 2.5.6 – Beneficiaries of UD. The population pyramid has eight rows but, as the scale defined for PD consists of seven sections, the last two rows of the pyramid were condensed into the last section, as these two have similar requirements.
- 2. Participatory Design.** The scale used to define the degree to which the community was involved in the housing process through PD is defined by the typologies, as detailed in Chapter Three, Section 3.6 – Community Participation.
- 3. Construction.** Due to the excessive number of houses on the backlog list, developments of 100 or more houses are considered an excellent quantity, for the purpose of this research. However, due to the quality of the houses being utmost

importance, the quality of the houses are similarly assessed. For the details about the criteria refer to Table 7, section 3.7.1 Means of Quantification of Housing Development Research.

- 4. Sustainability.** The scale for sustainability is not measurable in subsequent intervals, but rather as separate items that add numbers to the scale reading. Each item listed as a number would thus contribute one number to the scale reading. Items that fall within the category of sustainability are both ecological and economic in character.

The international and local low-cost housing developments that form part of this review process were selected based on two criteria: firstly, according to the amount of information that was available with regard to the development and, secondly, whether the development was considered a success, which was determined by the amount of media coverage and good publicity it had received. The amount of information that was available on each example was critical, as it informed the rating process of each project; the reviewer therefore required as much detailed information as possible to give an informed rating.

As the four sectors each receive a rating out of 7, they could be graphically represented. A rating of 7 out of 7 for each sector would indicate an optimal solution in terms of the criteria, as identified by this research. Such an ideal solution was unlikely however, due to various factors as emerged from the discussion primarily in Chapter Two with regard to the Literature Review.

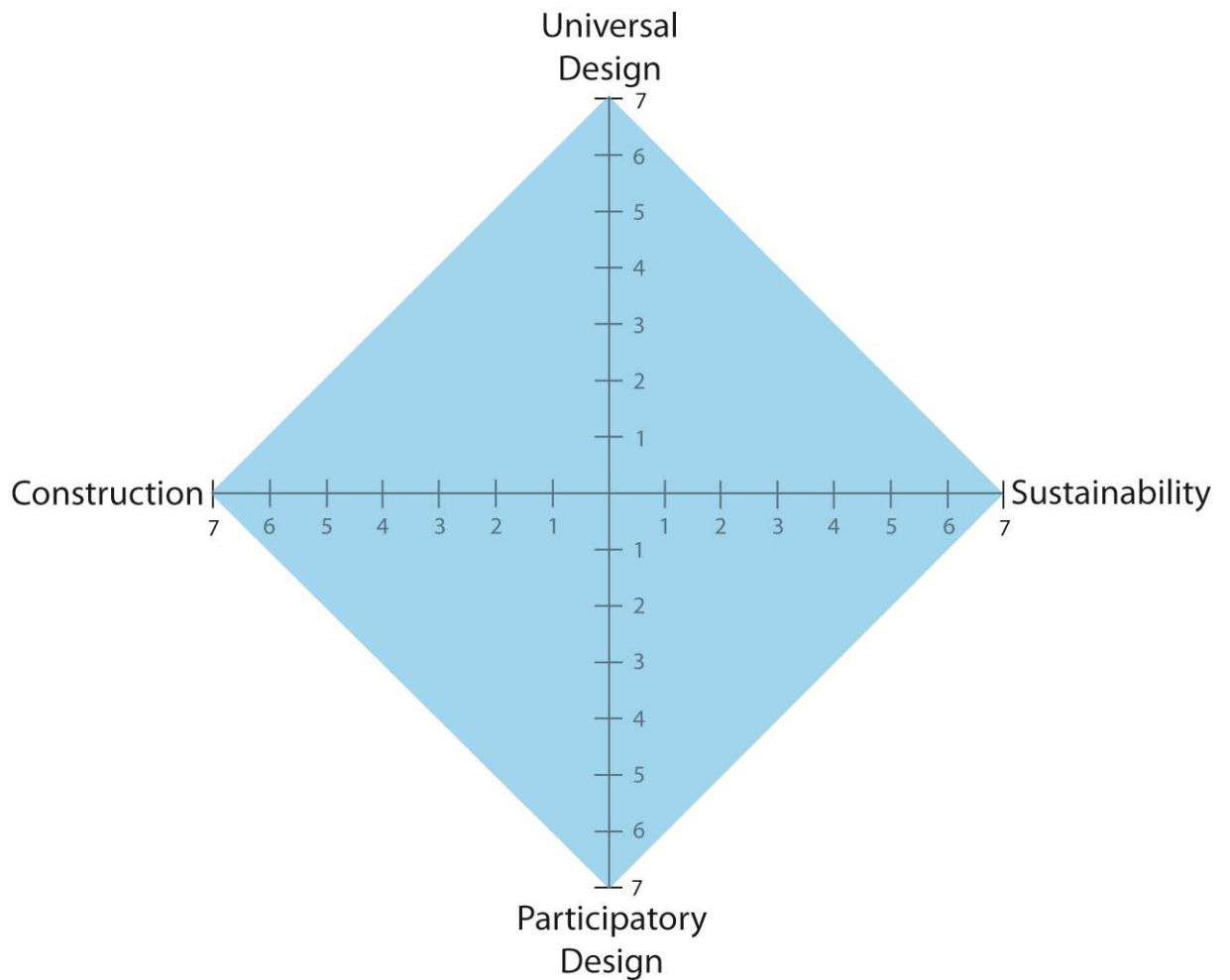


Figure 4.1: Optimal solution for defining the long-term success of low-cost housing in terms of the predefined review criteria, hereafter referred to as the “mean” (Author’s construct, 2015).

Having introduced the measure and analysis tool in more detail in this section, the following section deals with the application thereof in the context of this research. The rating for each of the quadrants as defined for low-cost housing is hereafter employed on each of the four international and each of the four local examples, for which the findings are detailed and illustrated graphically in the next section.

4.2.1 International Examples

4.2.1.1 International Example 1: Box House by Yuri Vital, São Paulo, Brazil



Figure 4.2: Images of box houses in São Paulo, Brazil by Yuri Vital, viz. a row of units and an individual unit shown from the outside, and the interior of a finished unit (Damen, 2009).

Introduction:

The design of these box houses makes provision for the following: on the lower level, there is a parking space for one car, a working area and a place, where the dustbins can be located. The first floor houses the kitchen, the toilet, the lounge area and a small dining area. The top floor has two bedrooms and the bathroom. The front facade also includes a water tank, which is designed as an integral and structural element. The brief was to design low-cost housing units based on new architectural thinking; the architect thus used clean and rational design principles to develop the set of 17 low-cost units. The construction methods are conventional brick and mortar, as well as an inserted slab mounted on top of beams, which make up the dividing wall between the units. The units are all connected, with a street running between them; this creates a feeling of spaciousness and improves the visibility of the surroundings. The total project area is 1,011m² and the total area of each unit is 46m² (Damen, 2009).

“With the main duty to tell the world how architecture can contribute to good housing solutions for those who has a less-favored income, this project begins with the idea that social housings can unite both aesthetic and functional qualities, with no need of high costs – Yuri Vital” (Damen, 2009).

Author’s review and comments:

Although the units in this low-cost housing development are not physically accessible for individuals with various degrees of disability, because stairs are needed to access the different levels, including the lowest level, the overall design and construction of the units is aesthetically pleasing. This is likely to give home owners a sense of pride for their homes, and to motivate them to take care of their surroundings and to lead a dignified life. The colours of the various surfaces of the houses appear to have sufficient contrast to assist people with varying degrees of visual impairments to distinguish between walls and doors and various other surfaces. The use of a water storage tank as part of the design of the facade and the integration of recycling bins contribute to a more environmentally sustainable housing development, and assist with enhancing awareness of recycling. The location of the housing development also ensures easy access to public transport and therefore to economic opportunities, which is not always considered in the case of low-cost housing schemes.

It appears that, if needed, a stair lift can be fitted to the internal staircase to ensure accessibility to the top floor, but the access from the parking area into the house is limited. However, if part of the parking bay is sacrificed, an L-shaped ramp can be installed to gain easier access to the first floor.

As each unit has a total size of 46m², these units are slightly bigger than the average housing developments in Cape Town, which are generally limited to 40m². However, there is no evidence in the existing literature that any form of PD was engaged in during this design process. Although this is a beautiful housing development, community involvement appears to have been neglected. As this aspect is essential for our purposes, it is regarded as a shortcoming that will reduce the PD rating.

Rating of review aspects:

Universal Design: As the houses are currently physically inaccessible to persons with specific mobility requirements, and not easily able to accommodate small children, it is clear that they are designed only for 'able-bodied' people. They are thus given a rating of 2/7 with regard to the application of Universal Design.

Participatory Design: According to the available literature, there is no evidence that any community engagement was undertaken and therefore the rating for Participatory Design is 1/7, which is described as Passive Participation.

Construction: Although this development is a small project in terms of the number of houses that were constructed (i.e. 17), the ratings indicate that having less than 50 houses of an exceptional quality is better than having more than 100 houses of merely an acceptable quality; this therefore earns this development a rating of 4/7 for construction, which the highest possible rating according to the defined criteria for a housing development of less than 50 houses.

Sustainability: The housing design does bring to the light the importance of saving and reducing water consumption, and it also provides facilities for recycling. These two aspects gain the design two points from the sustainability ratings. Moreover, the location of the development, which provides easy access to economic opportunities for people living in these developments, earns it an additional point, resulting in 3/7 for sustainability.

The graph for the Box House in São Paulo, Brazil by Yuri Vital, according to these review criteria, is as follows:

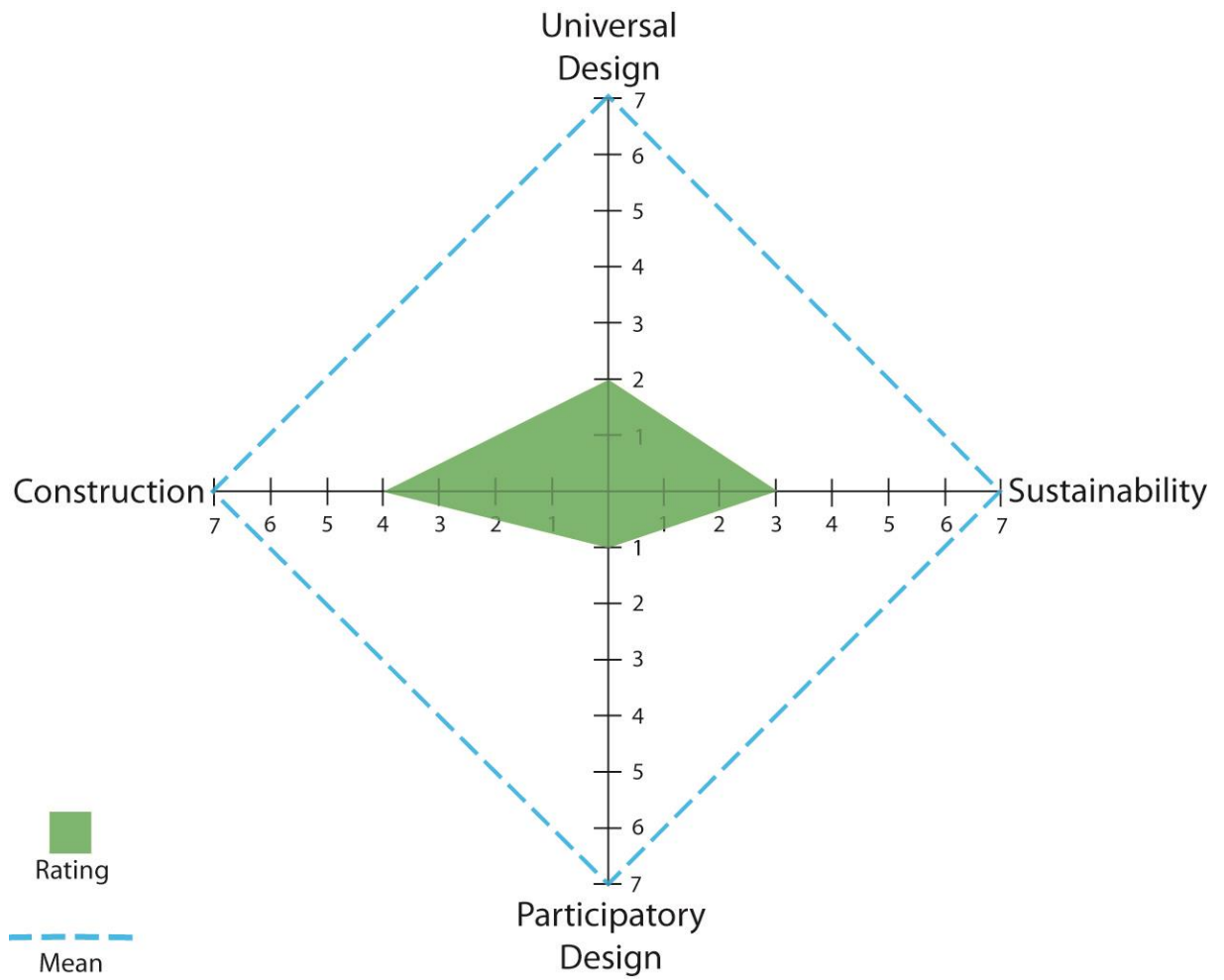


Figure 4.3: Review of the box house in Brazil, according to the specified criteria (Author's construct, 2015).

4.2.1.2 *International Example 2: Social housing by Dosmasuno Arquitectos, Carabanchel, Madrid, Spain*



Figure 4.4: Images of the social housing developments in Madrid, Spain by Dosmasuno Arquitectos, photos by Miguel de Guzmán (Chahine, 2011).

Introduction:

The units are designed around a concrete core structure, which has two main components, the living room and the bedroom, both of which are south facing. The core is cast in a “single high accuracy aluminium cast” (Chahine, 2011), to which the additional volumetric units are connected with pre-cast fixtures. The means of construction, which is limited to casting concrete and manufacturing light-weight ‘clip-on’ steel units, contributes to decreased construction costs as well as prevents the accumulation of rubbish on the building site, it increases the speed at which the building is constructed, and the light-weight structures reduce the need for additional cranes, which in turn reduces the operational costs for the construction (Chahine, 2011).

The total project consists of 102 housing units (52 single-bedroom units, 35 double-bedroom units and 15 triple-bedroom units). Each unit has the same single-bedroom set-up, with the additional bedrooms attached as ‘clip-on’ units protruding from the facade. The concrete

walls are cast and include all of the required infrastructure (electrical, water, insulation, etc.), and the cupboards are integral to the dividing side walls. There is also a solar-energy supporting system located on the roof to assist in providing electricity to the units. The building has been designed for auto-cooling and heating along with orientation sensitivity to the rising and setting of the sun; it has also been designed for ventilation, making optimal use of the natural elements (Chahine, 2011).

“The execution rate is daily, for it is possible to set/remove the casts and pour the concrete within the same day, being able to work on other tasks at the same time. Henceforward, the system performance is one dwelling per day. The advantages of this industrialized system are the quick setting-up, which speeds up the execution period and avoids rubbish production. On the other hand, it implies an increase in the material cost, due to the amount of concrete used, greater than in conventional construction.”
(Chahine, 2011)

A problem with this means of construction is that it is not possible to extend the units, as each wall is load bearing; as each unit is between 42m² and 66m², the spaces might become too small for families who then do not have the option of extending their units. Due to the units only being for hire and the high cost at which the units are valued, that the owners of the building do not intend to sell the units to the residents; effectively, therefore, the tenants are further restricted from extending their units (Chahine, 2011).

Author’s review and comments:

This development illustrates how the use of modularity could contribute to the overall design process and allow various individuals to adapt and change their housing needs to better suit their lifestyle and family needs. This is also an example of a mass housing development that has been constructed within a budget and in a location that is beneficial to the residents and the neighbourhood, due to increased access to economic opportunities. However, leaving these units as rentals adversely affects the sense of ownership of the units, which may in turn adversely affect the attachment and devotion of the residents towards their houses.

The modular design, though efficient and cost effective, may also have a shortcoming: The monotone colouration of the building makes it appear clinical and industrial; if there is no personality added to the building through the creative use of colour, it may reduce their apparent value. If so, residents may be less likely to become attached to this development; however, as these units are not intended to be owned by the people living in them, this might also have been part of the intention of the architects and/or owners.

The sizes of these houses are comparable to the more recent size of the housing developments in South Africa, namely, 40m². This makes it possible to compare with the number of houses that could be constructed in this format in relation to the urban sprawl developing in South Africa due to spacious housing developments on the outskirts of the cities, which adversely affects people's abilities to access economic opportunities and increases the number of backyarders in developments.

As there are facilities for parking, including designated accessible parking bays, as well as elevators installed in this development, it could be assumed that there is a certain level of access to the building for people with functional mobility limitations. However, as there is a lack of colour usage within the building (due to the overall use of white to attract heat during winter), and as orientation and way-finding throughout the building is limited, it is not suitable for people with functional cognitive limitations.

Rating of review aspects:

Universal Design: As the building design only takes into account physical access, it is rated as being unable to accommodate people who require the use of assistive devices, which would also include spectacles for those who have visual impairments. As the building design is not intuitive or easily recognisable, the rating for Universal Design is 4/7.

Participatory Design: As there are three available housing unit designs, it can be inferred that the user group was identified before the building was constructed. Participation in Information Giving was used for this project as the participants had no influence on the design of the development, and were merely told of what is available; they are merely dwellers within these housing units. Participation in Information Giving thus receives a rating of 2/7.

Construction: Although there is a lack of aesthetic appeal in the design, which is also a characteristic associated with people's likeliness to take emotional ownership of the housing units, the construction quality can be classified as being of an exceptionally high standard; because there are as many as 102 units and all of them are of an exceptionally high quality, the rating for the building is thus set at 6/7.

Sustainability: The installation of solar facilities reduces the cost of electricity and encourages residents to use electricity sparingly / to reduce their electricity usage. The building is located near economic opportunities and community facilities and provides access to public transport. Moreover, as the movement of the sun and air circulation are taken into account with regard to the orientation and facade of the building, and because, during the

construction of this medium-density building, the builders tried to produce as little waste material as possible, this building is rated at 4/7.

The graph for the social housing development in Spain, according to these review criteria, is as follows:

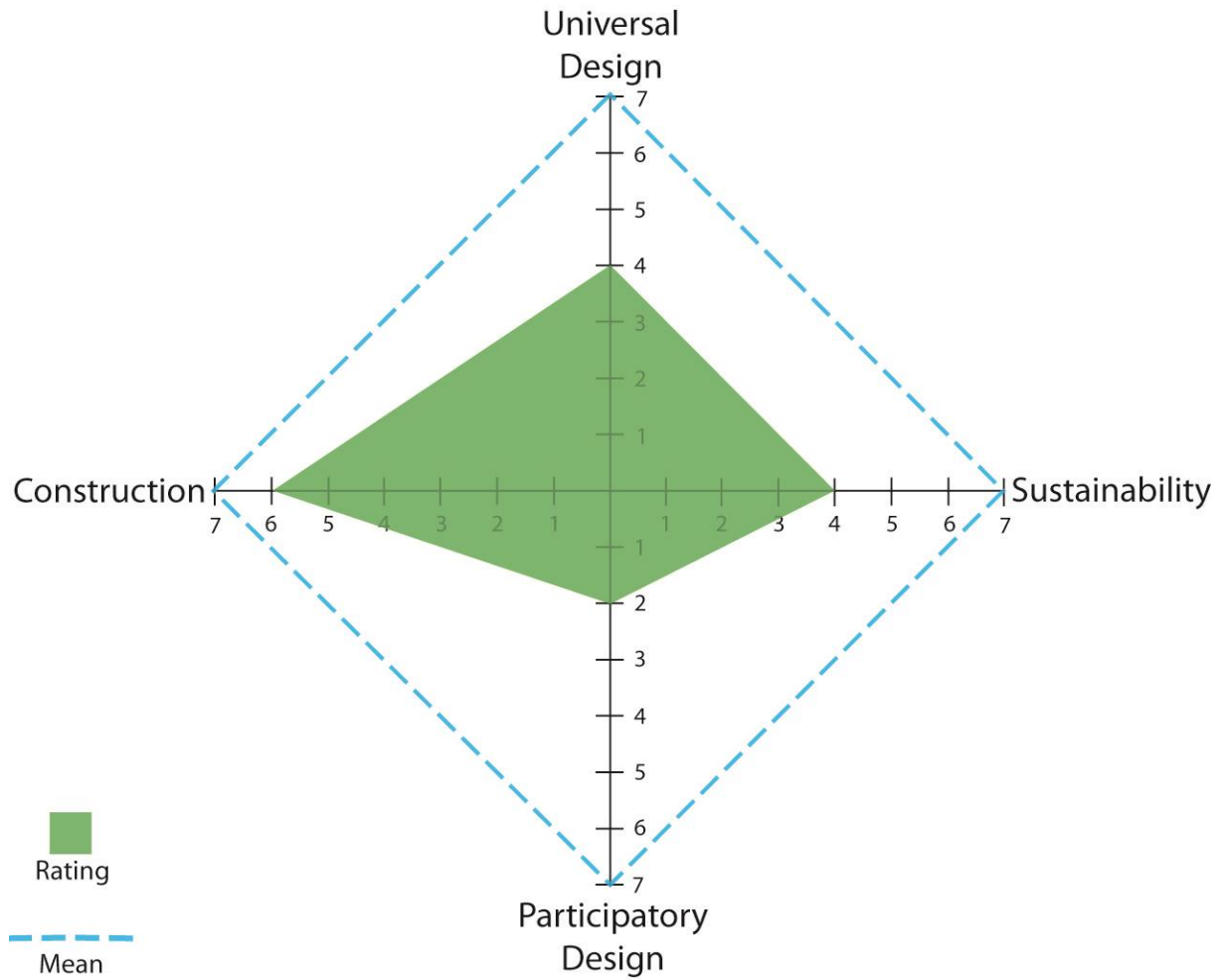


Figure 4.5: Review of the social housing development in Spain, according to the specified criteria (Author's construct, 2015).

4.2.1.3 International Example 3: Quinta Monroy by Elemental, Iquique, Chile

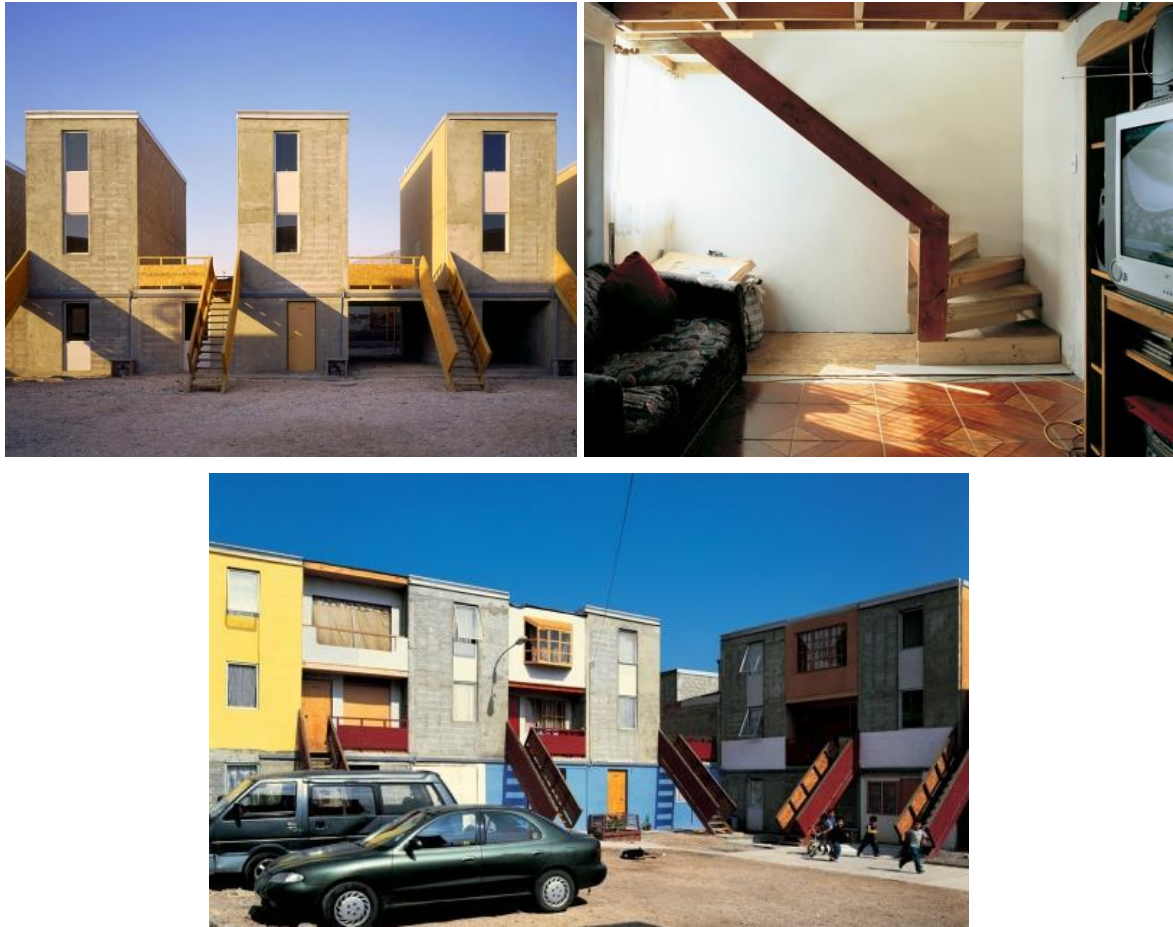


Figure 4.6: Final construction of Quinta Monroy social housing in Chile, where the climate is desert-like (ArchDaily, 2008).

Introduction:

This housing project in Chile, which was constructed in 2004, had a budget of US \$204 per square meter. The total site is 5,000m² in size, whereas the built-upon area covers a total of 3,500m². The buildings themselves were built from concrete and cement bricks (ArchDaily, 2008).

The reason for building this particular housing project was to house the 100 families that had been illegally occupying this 5,000m² piece of land for 30 years. The request from the government at the time was to house the families on the same piece of land and not to displace them, further out on the periphery. However, this meant that the cost of purchasing the land was excessively high as it was a section of land located closest to the city and its amenities and, given the budget, only 30 plots of land could be purchased for the development, which is where the 3,500m² area of housing was constructed. By not relocating the families to the outskirts of the city, it meant that they were able to remain closer to work

opportunities, education, transport and health, all which are all located within the city, and as requested by the families (ArchDaily, 2008).

Elemental, the development agency that designed and constructed the housing units, holds the view that “social housing should be seen as an investment and not as an expense” (ArchDaily, 2008). In other words, they seek to ensure that their initial seed capital will add value over time, which is contrary to the accepted norms in respect of social housing (ArchDaily, 2008).

Author’s review and comments:

In this housing development, the community remained intact, because community members were not relocated to other areas, which enabled the community to maintain the same level of coherence as before they moved into the new development. Restricting the amount of space available for each family to use for the expansion of their houses limits the number of family members that can inhabit a single unit, which is beneficial as the resources in the area are only able to sustain the 100 family that initially inhabited the space. It also ensures that the potential land sprawl, if the houses had been constructed differently, is kept in check.

This type of housing development potentially increases the housing density and reduces the creation of informal settlements. It also takes into account the concept of life-span housing, as elderly residents can live downstairs, where level access is easier to achieve than upstairs, while younger family members live upstairs.

The development consists of 100 houses, with each initial house covering an estimated 40m²; after additional construction, as envisaged by the developers, the total house size can be expanded to an estimated 70m², due to the space allocations that have been included into the construction (see Figure 4.6). Through engagement with the community members, the developers were able to manage their expectations, and the community members were in turn able to voice their opinions concerning the requirements of the community, such as location and configuration.

Rating of review aspects:

Universal Design: The developers took into account the requirement of life-span housing and granted level access to the ground floor. It is assumed that the elderly will thus inhabit the ground floor, whilst the younger family members live upstairs. The design thus takes into account the elderly, as well as people who require the use of assistive devices and aids. Residents are able to customise their homes, which enhances the likelihood of them

recognising their respective homes and taking emotional ownership of them. The Quinta Monroy development therefore receives a rating of 5/7 for Universal Design.

Participatory Design: As the people who were affected by the project were allowed to have a value added opinion as well as to be actively involved in the construction process before the houses were handed over, the level of participation is rated as Functional Participation (see Table 6, section 3.7.1 Means of Quantification of Housing Development Research), which is rated as 5/7.

Construction: A total number of 100 families are provided with housing as part of this project. However, no other provision is made for nice-to-have features in respect of the construction process. This development is thus evaluated as having acceptable quality as defined in Table 7, (section 3.7.1) and is rated as 3/7.

Sustainability: As this medium-density housing development takes into consideration access to transport and economic opportunities, as well as community facilities and their location, it is rated as 3/7 for sustainability.

The graph for Quinta Monroy by Elemental, according to these review criteria, is as follows:

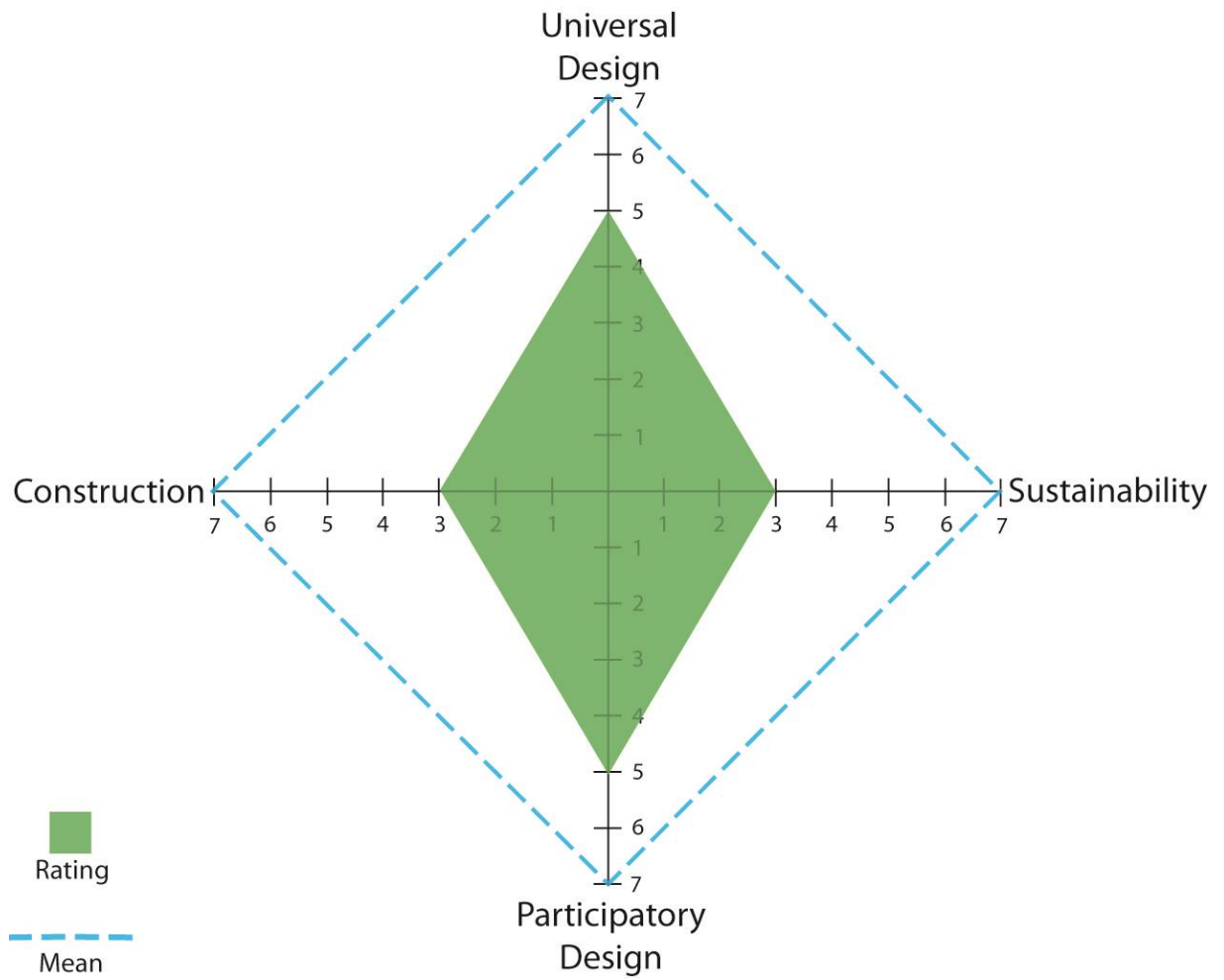


Figure 4.7: Review of the Quinta Monroy housing development in Chile, according to the specified criteria (Author's construct, 2015).

4.2.1.4 International Example 4: Monterrey Housing by Elemental, Monterrey, Mexico



Figure 4.8: Final construction of Monterrey, a low-cost housing project in Mexico, by Elemental. Photos by Ramiro Ramirez (Bustler, 2010).

Introduction:

This housing development is based on the Quinta Monroy project by Elemental in Chile, and constructed by the same company. It consists of 70 units, with each unit initially consisting of 40m², although the total area can increase to 76.6m², once owners have completed upgrading and expanding their units. Total area of land available for the development is 6,591m² (Bustler, 2010).

This development is located in a middle-class neighbourhood and required a housing density similar to that of Quinta Monroy in Chile. In Mexico, the annual expected rainfall is 600ml, which is not the case in Chile (where the development was situated in an area with a desert climate), and so Elemental's design had to accommodate the change in climate (Bustler, 2010).

Even though the budget for this development was more than double that in Chile, the application of the different building standards and codes significantly increased the cost of

the development (the cost of meeting the requirements of building standards and codes was exponentially higher than that in Chile). The design is based on that of Quinta Monroy in Chile: the difficult parts of the house (kitchen, bathroom, stairs and walls) are constructed on the ground floor, with a two-story apartment being constructed above that. The structure is again designed to accommodate the expansion of the family residing in each unit, but in this design the roof over the entire constructed area was included, where previously the roof was left off and the residents had to construct it when they wanted to extend their houses. The inclusion of the roof over the entire constructed area (see Figure 4.6 for the section of roofing not provided at the development in Chile and then Figure 4.8 for the roof over the entire constructed area in Mexico) provided a definitive profile (restricted space in which people could construct extensions to their houses) but also offered residents better protection from the elements of the weather as well as to offer additional constructional strength as the roof was built as an integral part of the building. Each housing therefore, upon handover from the constructors, consisted of one living space, a complete kitchen and bathroom (both with all of the required electrical, plumbing and water installations) and each unit then as the option of constructing additional rooms in the available space.

As Bustler (2010) explains:

“This building is porous so that the growth can occur within the structure. On one hand we want to frame and give rhythm (more than control) to the spontaneous construction so as to avoid deterioration of the urban environment over time, and also make the process of expansions for each family easier. The proposed continuous roof above the volumes and voids protects the expansion zones from rain and ensures a definitive profile of the building toward the public space.” (Bustler, 2010)

Elemental has learnt from previous housing developments in low-income areas that green spaces quickly deteriorate due to a lack of maintenance and available funds to tend to the gardens. They therefore created a common ground area, onto which all the units lead, and a communal garden space that is close to the units, that incorporates the parking area (for families that have access to a vehicle) and that is thereby easier to maintain and similarly supports social interactions (Bustler, 2010).

The developers of Monterrey took into account the ability of the prospective home owners to complete the construction of their own houses (after the construction of the initial room, kitchen and bathroom). Similar to the previously reviewed development, the units consist of a ground floor apartment, with a separate double-storey apartment on the first and second floor. Once the cavities in the buildings have been filled with any additional constructions by

the homeowners or residents, the ground floor apartment will have an area of 58m² and the double storey apartment will have a total area of 76m² (Bustler, 2010).

Author's review and comments:

The construction of this development takes into account life-span design; this is inferred from the fact that access to the ground floor apartment is only restricted, in the initial design, by a small step that can easily be converted into a ramp to allow great accessibility. This accessible ground floor dwelling would thus enable the elderly or people with various mobility or other limitations to live on the ground floor, while younger, more agile people could occupy the first and second floor apartments.

Consideration was also given to the location of the development within the city as well as access to transport services and other services that would benefit members of this community. The secluded central courtyard area, which serves as a common area for all inhabitants of the development, is accessible and easy to maintain and keep clean, due to its manageable size in comparison to the number of houses in the development.

Rating of review aspects:

Universal Design: As was the case in the previously discussed housing project, it appears that Elemental has taken into consideration the requirements of life-span housing; this can be inferred from the fact that level access is granted to the ground floor, with additional vehicle access being provided. This design typology allows for the whole family to reside in a single housing unit. The design takes into account the elderly, as well as people who require the use of assistive devices and aids. Residents are moreover able to customise their homes; this enhances people's ability to make their homes recognisable and uniquely suited to their needs. Monterrey therefore receives a rating of 5/7 for Universal Design.

Participatory Design: As people from the affected community are participating in the completion of their own homes, which is one of the predetermined objectives of the project, the level of participation is rated as Functional Participation, namely, 5/7.

Construction: The construction of the 70 housing units is of exceptional quality and therefore receives a rating of 5/7.

Sustainability: Access to public transport and community orientated facilities was considered in the location of the building. Due to adverse weather conditions, sustainable methods of construction in terms of orientation and design were used, and protection against the weather was considered in the medium-density development. The common grounds and

gardens, designed for social networking and gatherings, constitute a type of ecological landscaping, which increases the rating for sustainability to 4/7.

The graph for Monterrey by Elemental, according to these review criteria, is as follows:

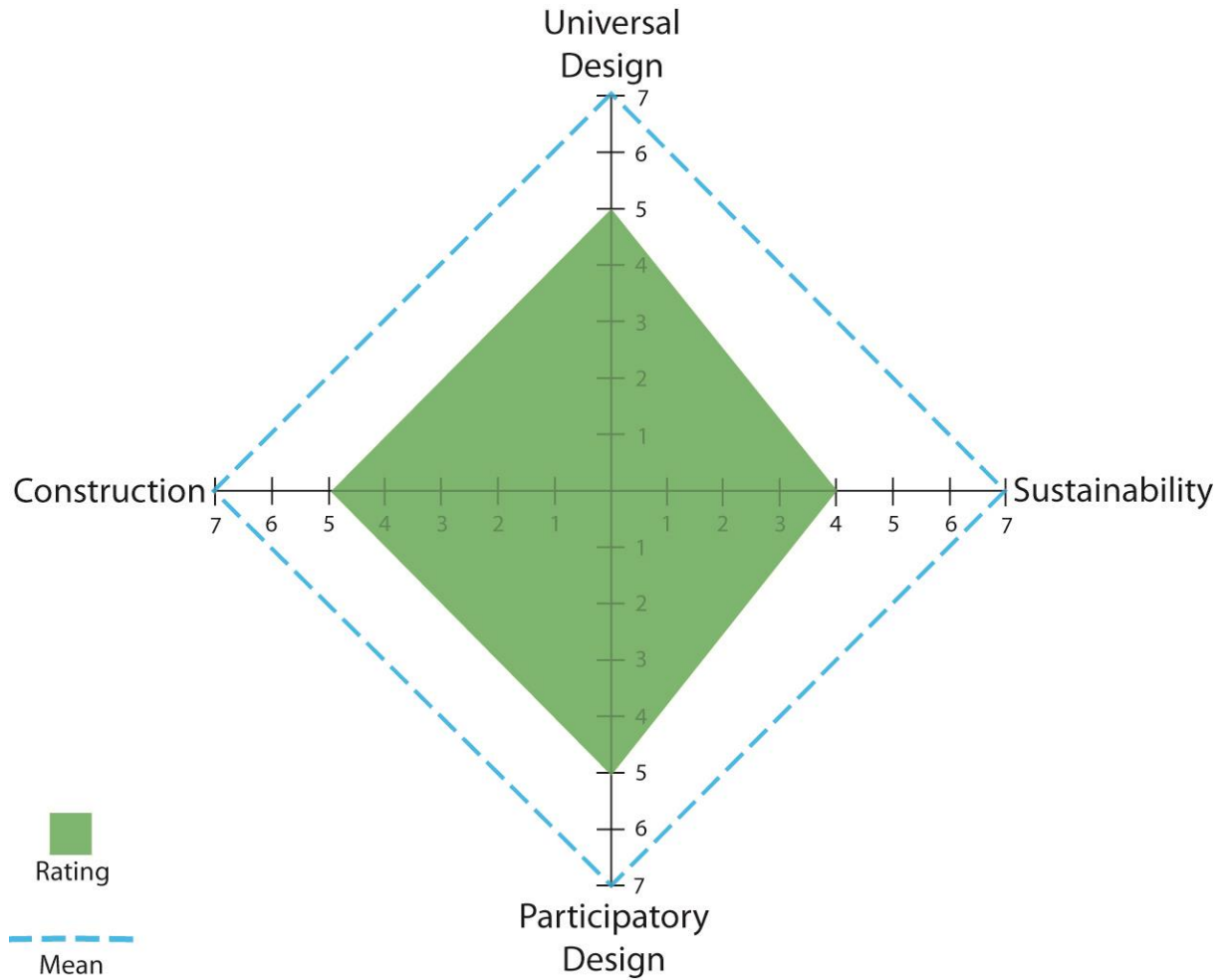


Figure 4.9: Review of the Monterrey housing development in Mexico, according to the specified criteria (Author's construct, 2015).

4.2.2 Local Examples

4.2.2.1 Local Example 1: PELIP Housing by Noero Wolff Architects, Red Location, Port Elizabeth, South Africa



Figure 4.10: Social housing development in Port Elizabeth (Red Location), South Africa, by Wolff Architects and the NGO, PELIP Housing Company. Photos by H. Wolff (Noero Wolff Architects, 2011).

Introduction:

The brief was to design an innovative solution to housing that would ease the local (South Africa) housing delivery problems. The architects assert that this solution is a demonstration of the “values and possibilities in housing which are of general importance and [which are] also to be adapted to the particular nature of its context (site, climate, social & economic)” (Noero Wolff Architects, 2011). The design had to be replicable, not only on this site but elsewhere in the city; the houses had to accommodate people with disabilities and to make provision for extensions to the houses (Noero Wolff Architects, 2011).

Part of the understanding that the new residents had to gain was to make explicit their choices in housing development and to realise how housing and planned surrounding infrastructure and economic developments could positively contribute to their quality of life.

The feedback that the architects, designers and developers received from the prospective residents led the architects to redefine what has previously been described as 'good housing'; this concept is under debate throughout the country. The site, the Red Location, has a political connotation, as it was the first area in the country, where violent revolt against Apartheid took place during the 1950s, and it is therefore today recognised as an important historical site that is occupied by very poor residents but who nonetheless "enjoy a vital community life" (Noero Wolff Architects, 2011). It is due to this political positioning that the development of the housing units in this area is also accompanied by the development of a cultural precinct and a museum; these, in combination with the new houses, may indeed establish a sustainable livelihood for the low-income residents of the area (Noero Wolff Architects, 2011).

Due to the importance of the development in this area, the project had to illustrate the following principles by Noero Wolff Architects (2011):

1. A change in perception about housing developments, concerning design and construction as well as policies.
2. The definition of good housing in the broader sense, including location close to the city, access and use for people with disabilities, income generation, material use and water conservation.
3. Developments had to be affordable as well as being aesthetically pleasing.

Due to the political volatility in the area and the community's reservations about any development in the area, the architects first built 16 show houses to illustrate the development to the community and to secure their buy-in. These houses broke the mould of conventional developmental housing (one plot of land per family with a small house, which encourages land sprawl), in terms of the size and the standard of such housing. Once these show houses had been completed and the community had accepted the architect's reassurance that the actual houses would indeed be built like the show houses, the architects received over 400 applications for housing from the community and a further rollout of 100 houses was designed and prepared for construction (Noero Wolff Architects, 2011).

The architects had to apply new thinking, when developing the housing in the Red Location; they had to consider both political and cultural issues, which were all intertwined with the needs of developing low-cost housing. Noero Wolff Architects make a strong case in that building new houses, no matter what form they come in, cannot solve the economic situations within the community but can only contribute to better living; this emphasises the

need for other developments within the housing areas to uplift the community (Noero Wolff Architects, 2011).

Author's review and comments:

A considerable amount of participation with the people in the community, as well as with government departments and other local authorities, was undertaken during the start-up phase of this development. It can thus be described as an Active Participatory Design.

Although the construction methodologies were traditional- in terms of using bricks and mortar- the configuration was inspired by the Quinta Monroy and Monterrey developments by Elemental. The methodology used to define this project by the Architects, was one of the first in terms of the progress that was made towards community development and upliftment through low-cost housing. The Red Location development takes into account life-span design as well as quality of life, job creation and access to services and facilities; it also makes use of sustainable methods of construction and economic development to encourage self-sufficiency whilst also prioritising aesthetics and affordability.

The development of the low-cost housing and its integrated with the surrounding pedestrian precincts, the cultural precinct and the museum, all contribute to the creation of employment opportunities for the inhabitants of the houses.

Rating of review aspects:

Universal Design: Particular efforts were made to design the housing units to accommodate people with disabilities; therefore, with regard to accessibility, the design accommodates independent wheelchair users, and is thus rated as 6/7.

Participatory Design: The community was greatly involved in the creation of the economic opportunities within the area of the development, and also played an important role in the design of the social and cultural aspects of the development. The coordinators furthermore managed a skill transfer programme, which created additional economic support in the immediate surroundings of the housing units. Given the degree of community involvement, and their input in the design process as well as in the development of action plans and capacity building, the Participatory Design rating is 6/7, which is Interactive Participation.

Construction: With the total number of houses for the project standing at 116 units, it is one of the largest developments being reviewed for this research. Structurally sound and very neat construction has led to exceptional quality housing and, given the large number of units

as well as the associated infrastructure, such as a museum and pedestrian infrastructure, the overall rating for Red Location according to these criteria is 7/7.

Sustainability: The development has access to transport and is a strongly community orientated development. Design features included the reuse of rainwater, thereby reducing water usage. The orientation of the medium-density housing development took into account the movement of the sun and wind conditions, thus contributing to the long-term sustainability of the development. Lastly, access to economic opportunities onsite was a critical design feature for the developers, which leaves the sustainability rating for Red Location at 4/7, although seemingly low, according to the criteria in Table 7, section 3.7.1, this development lacked aspects related reducing electricity cost and usage, easy access to public transport and ecological landscaping which all contribute to a more sustainable community.

The graph for Red Location by Noero Wolff Architects, according to these review criteria, is presented in Figure 4.11 below.

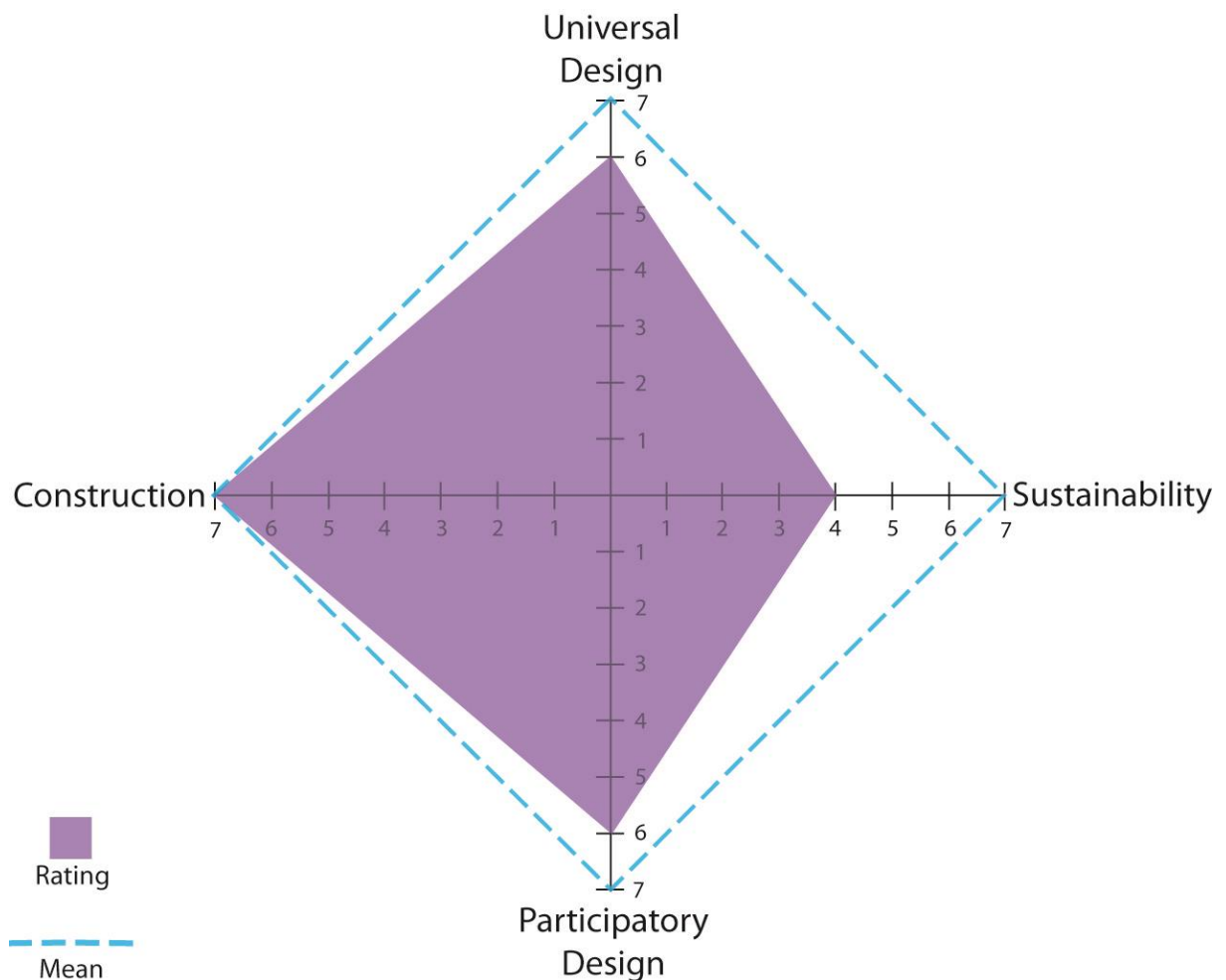


Figure 4.11: Review of the Red Location housing development in Port Elizabeth, South Africa, according to the specified criteria (Author's construct, 2015).

4.2.2.2 *Local Example 2: Marconi Beam Affordable Housing Project by DAG, Milnerton, Cape Town, South Africa*



Figure 4.12: Images of the types of housing that were erected as part of the Marconi Beam Affordable Housing Project. The project was run by DAG, which is based in Cape Town (Haysom, 2009: 19-39).

Introduction:

This housing development dates back to the 1990s. The first houses covered a total area of 22m², while the later versions were slightly larger at 25m²; plot sizes ranged between 100m² and 200m² (Haysom, 2009: 11-20). 22m² was the minimum size of low-cost housing at the time of construction (Haysom, 2009: 40): “A key innovation of the Marconi Beam project was that, from the outset, the informal settlement community participated actively, initially in the negotiations and later by leading the planning and implementation” of the project (Haysom, 2009: 22).

DAG supported the elected leadership of the community with ongoing training and support with processes and process management. Although the project was plagued by various problems, “its primary objective had been achieved: almost 5,000 people had been formally housed, and the conditions of the land agreement had been upheld in an empowering and equitable process” (Haysom, 2009: 22-23). Active Participatory Design, as it took place at the Marconi Beam development, “was time-consuming and exhausting for the leadership, but it empowered the community by enabling them to make informed decisions and challenge the status quo” (Haysom, 2009: 25).

It was essential to the success of the development to have a “good location”, which is partially defined as being located “close to transport, employment and other urban opportunities” (Haysom, 2009: 25) and “within urban activity nodes or within walking distance of an existing public transport route, schools, clinics and libraries” (Haysom, 2009: 25). The architects and developers recognised that the location of the housing development “is often more important than housing quality, as it directly impacts the accessibility of urban opportunities and underpins social networks and livelihood strategies critical for survival” (Haysom, 2009: 25).

Various housing types were originally developed (concrete wall construction and using aluminium window frames for examples) but, due to cultural traditions, the more conventional housing type (by South African standards which is brick and mortar with wooden window frames) was the only design option that was deemed acceptable by the community. Provision for the community within the design and construction was made by including a primary school, a nursery school, a job creation centre and multiple churches (Haysom, 2009:27-33). As a result of the interactive participation of the community, it became clear that the inhabitants of the houses wanted “access to services”, a place where they had protection from “extreme weather”, and where they faced “a diminished fire risk and could create a safe housing environment where social networks were maintained” (Haysom, 2009: 39).

The mostly one-bedroom houses did have examples of sustainable materials (like local stone and concrete) but this was not readily accepted by the community as they felt that it was sub-standard or flawed in some way. Residents also underwent skills training and development which enabled them to participate in the construction of the houses. The up-skilling of the people in the community is evident from the variety of renovations that have taken place within in the community since its construction (Haysom, 2009: 40-41).

“The project proves that good location, mixed-use planning, cross-subsidisation and a multi-stakeholder approach can work and can overcome the limitations of land economics that perpetuate urban sprawl and spatial inequality. Small, basic starter houses were provided with the belief that residents would subsequently upgrade their houses incrementally” (Haysom, 2009: 46).

Author’s review and comments:

Given the political volatility at the time of the negotiations for this housing development, the amount of Active Participatory Design that was undertaken during the inception of the project

as well as for its duration is exceptional and should serve as a benchmark for future housing developments.

More ecological means of construction (such as concrete, the use of bamboo, thinner walls cast of concrete, etc) were presented to the proposed residents during the design phases, but these were dismissed as inferior according to their opinions, and so more unsustainable materials (more concrete, more bricks) were used for the construction of the houses. The location of this housing development was regarded as particularly important by the inhabitants due to the high cost of transport, if the development had been located far away from the existing transport infrastructure. The education and development of the people in the community is essential for the long-term sustainability of developments such as this, and these were all taken into consideration at the Marconi Beam development.

Although traditional construction methods (brick and mortar) were employed, and at the time of the development the houses were a mere 22m² in size, the project had achieved a scale of housing that is seldom seen, i.e. housing nearly 5,000 families. On the downside, however, the individual housing units, each constructed separately, encouraged urban sprawl and the large open spaces surrounding the houses encouraged residents to create informal housing extensions, which in turn increased the population density of the area. The plan of this development was to house, more comfortably and within a safe environment, the people who were living in informal settlements in the area at the time. The up-skilling of people in the area with construction skills as well as the increased availability of land (due to the assigning of plot spaces) led to the construction of more than the required number of houses, increasing the number of residents. This increase in the number of houses and residents resulted in an increase in crime.

Rating of review aspects:

Universal Design: Because the developers also designed and constructed a school and a nursery school, it is assumed that the requirements of women and children were taken into consideration; this therefore results in a rating of 3/7 for Universal Design.

Participatory Design: The Active Participatory Design used in this project could be associated with self-mobilisation, which is the ultimate rating for Participatory Design, as specified for this sector of the research. As people from the community took the initiative to change their own environments and situations, the approach at Marconi Beam can be described as a bottom-up approach and is rated 7/7.

Construction: The rating criteria for this development are not a simple categorical application because of the vast number of houses that were constructed (estimated to house 5,000 families) and the construction date of the development, which has implications for the materials, processes and land that were available at the time. The addition of schools, a job creation centre and churches as part of the development all contribute to a more holistic design approach for the development. However, given the current review ratings, the houses are not exceptional in quality. As they are only deemed 'acceptable', the highest rating for construction is therefore 3/7, even though the sheer number of houses and the provision of additional facilities could potentially indicate a higher rating.

Sustainability: The location of the development suggests that the developers paid particular attention to access to transport as well as economic opportunities; moreover, as the community was central to the design of the development, emphasis was placed on the creation of community orientated facilities. Although attempts were made to use sustainable materials, these were rejected by the community; there was no further focus on sustainability, such as orientation in the layout of the buildings, the use of water/electricity conservation measures –such as rainwater tanks and solar heating or solar panels-, recycling facilities or ecological landscaping. It is assumed that this is because this development was constructed many years before the increased focus on sustainability. Consequently, the rating, based on the specific criteria for sustainability, is low, viz. 2/7.

The graph for the Marconi Beam development by DAG, according to these review criteria, is as follows:

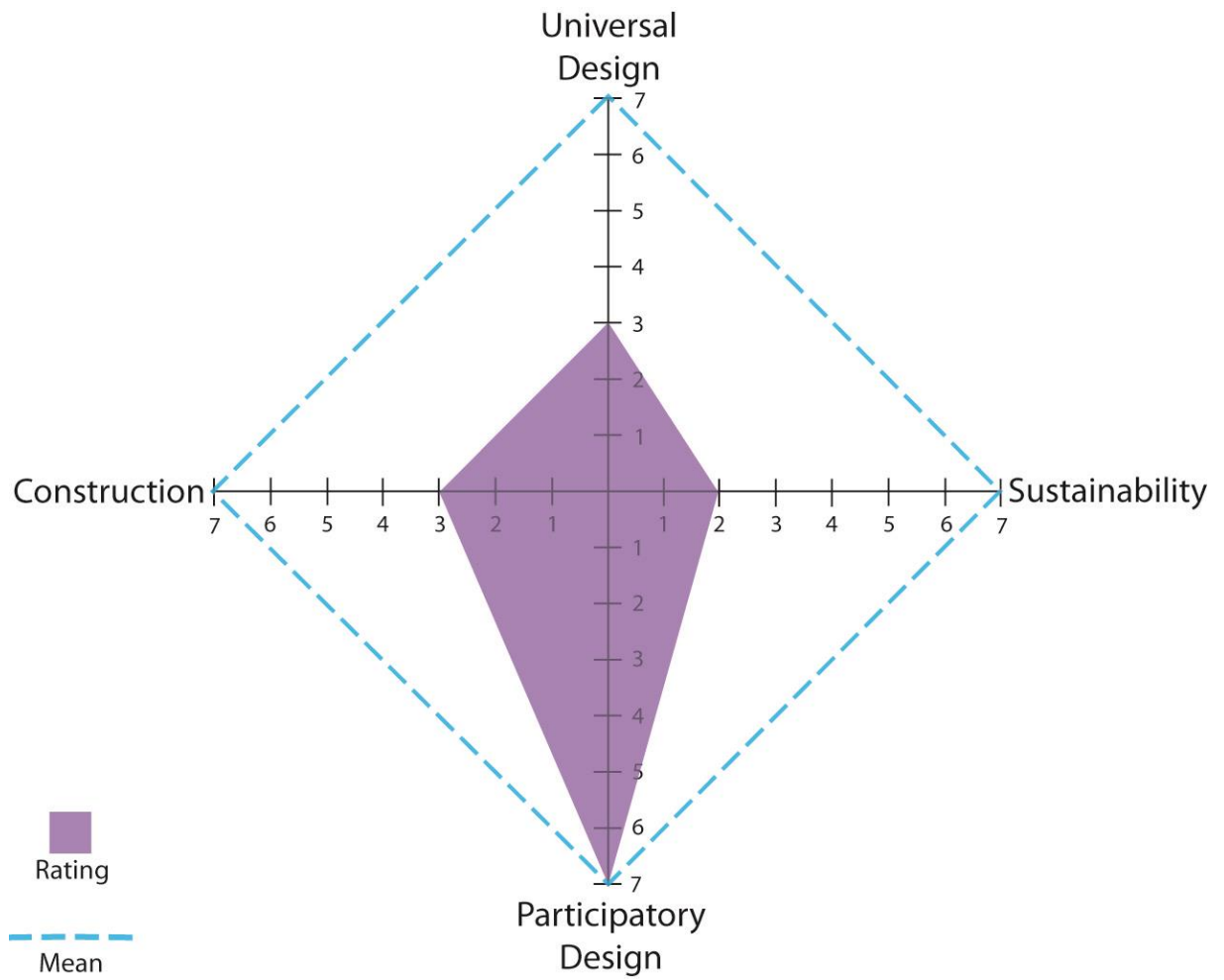


Figure 4.13: Review of the Marconi Beam development in Milnerton, Cape Town, South Africa, according to the specified criteria (Author's construct, 2015).

4.2.2.3 *Local Example 3: Freedom Park Informal Settlement Upgrade by DAG, Mitchells Plain, Cape Town, South Africa*



Figure 4.14: Residents of the Freedom Park Informal Settlements Upgrade programme had a choice between four housing options: freestanding houses, semi-detached single storey houses, rows of double storey houses, or semi-detached double storey houses. The project is a development from DAG, which is based in Cape Town (DAG, 2009: 9-49).

Introduction:

DAG’s aims were for the community of Freedom Park to build “their capacity to mobilise as a community, democratically elect leaders, build consensus, register as a Non-Profit Organisation and ultimately design and construct their own neighbourhood” (DAG, 2009: 11). Their emphasis was thus on up-skilling residents.

The Freedom Park community, by the end of the construction phase, had completed 493 houses, which housed 2,440 people. The project had thus been successful in

“achieving not only good urban form, but also building social capital to address their other social and economic needs. The Freedom Park case is a model for best practice in community led and centred development. Poor families participated actively in designing their settlement, from

participatory site layout and design to infrastructure development and construction” (DAG, 2009: 11).

Community leaders, with the help of DAG, the Freedom Park Development Association (FPDA), who voiced the opinions, needs and concerns of the people in the community. It was through the FPDA that residents were able to play a major role in the planning process of the community; they collectively drew up a set of guidelines for the layout and design process.

These guidelines included:

- providing safety and security;
- ensuring affordability;
- providing everybody with the same plot size;
- moving as few shacks as possible;
- facilitating energy-efficient passive solar design;
- ensuring greater control by the community over public spaces;
- facilitating maintenance and cleanliness; and
- providing access.

(DAG, 2009: 24-25)

In addition, “FPDA wanted fewer access points, more curves in roads to create a greater sense of enclosure and reduce traffic speed, and a number of smaller community spaces spread throughout the settlement”, which FPDA insisted would be maintained by the residents (DAG, 2009: 25).

Residents were trained in construction and employed by the contractor; not only did this provide a means of income for some of the families, but it also meant that the community could receive inside information about the construction process and what was happening behind the scenes. Due to an escalation of crime in the area, which was a direct result of the construction taking place, the FPDA initiated a neighbourhood watch, which, again, enhanced the strong sense of community at Freedom Park (DAG, 2009).

Freedom Park houses range in size from 42m² to 52m², depending on the design and layout of the house. It was the FPDA that “recognised the need for sustainable and efficient land use and discouraged residents from choosing free-standing, single-storey houses” (DAG, 2009: 28); moreover, “in 2002, the FPDA (independent of the assistance of DAG) developed recycling, vegetable gardening and greening projects” (DAG, 2009).

Due to the deadlines set by the construction contractor, the houses were built speedily and by unskilled labour. Unfortunately, this meant that the contractors were not able to provide for

sufficient supervision, which resulted in poor workmanship, bad quality housing and unfinished homes (DAG, 2009:29-30). This all had the undesired but entirely expected results where, “after taking ownership of their houses, beneficiaries displayed a low level of ownership, failing to take responsibility for looking after them” (DAG, 2009: 31), so all the hard work DAG had put in at the beginning and during the project, with regard to getting buy-in from the community, had gone to waste.

DAG established several focus groups to decide on the layout of the housing area, these groups were representative of the different spheres that were required within the development such as “income-generating resources, transportation options, household size and energy source”. These groups were essential in “understanding household assets and livelihood strategies” (DAG, 2009: 34).

The results of the planning sessions led to the location of essential resources within walking distance from the development, which naturally pleased residents. These resources included “the social grant pay-out point, primary health care clinic, railway station, primary and high schools” (DAG, 2009: 35). The planning also led to increased access to food vendors and income generating opportunities due to the location of the development in close proximity to transport and residents therefore also had access to recreational activities such as the beach, shopping centres and the nature reserve. Collectively this contributes to a more socially cohesive and active society. While at the same time, households were able to save money due to reduced costs of electricity due to the installation of solar panels and North facing houses, which again contributes to a more sustainable means of living. (DAG, 2009: 41).

Author’s review and comments:

The Freedom Park development had numerous problems with the roll-out of the project but the community was always at the heart of the development and played an important role in the holistic development of the community. This resulted in a strong sense of community that felt part of the housing development.

After the initial delivery of the houses, the community had to take more control of the lack of services in their community, as the developers had left behind a myriad of unfinished houses and poorly built houses. This desire to make their community a better place was initiated at the beginning of the development and continued until well after all external parties had left the development site. This was largely due to the active participation from the community in the design and planning phases of the housing development and due to the training that community members received during the initial construction phases. They were thus able to

build better houses than what they had received from the contractors and, moreover, were able to complete and upgrade houses that had been left unfinished. Later developments from the community also included vegetable gardens, recycling initiatives and greening areas, which are all maintained by the community.

The Freedom Park development was a community driven project right from the outset, when the informal settlement was established on the same ground in 1998. In 2000, it was the community leaders who sought assistance with the layout and design and general hygiene of the community. And so, in its very conception, this development was a bottom-up driven approach.

Rating of review aspects:

Universal Design: Again, based on the fact that this housing development took into account the construction of schools and clinics, it is assumed that the housing design also considered the accommodation of women and children; this gives it a rating of 3/7. However, the housing designs did not accommodate the integrated design of pedestrian infrastructure leading to the entrances of the houses, and no other accommodations were made for level access.

Participatory Design: Self-mobilisation is clearly the driving factor behind the development, as it was the community that required the assistance of the role-players and not the other way around, which is more often the case. This project was a bottom-up approach from its inception, which gains it a rating of 7/7.

Construction: Similar to the Marconi Beam housing development, the Freedom Park development consisted of nearly 500 houses. Although the construction of the houses was initially poor with many units unfinished, the houses that were finally handed over to owners were of an acceptable quality, because people from the community had been trained and up skilled. As was the case with Marconi Beam, even though the developers designed and finally constructed clinics and schools and vast numbers of houses, the quality was only deemed to be acceptable, rather than exceptional, and therefore the highest rating applicable to this development is only 3/7.

Sustainability: Although features associated with sustainability did not initially play a significant role in the design of the development, the community did subsequently enhance the environment: it became strongly community orientated; assisted people to reduce electricity use and cost, encouraged recycling and waste disposal, and assisted residents to grow produce locally. As a result of this, in conjunction with the designed orientation of the

houses to maximise the use of the natural elements and the fact that the location allowed easy access to economic opportunities, the rating is 5/7.

The graph for the Freedom Park development by DAG, according to these review criteria, is as follows:

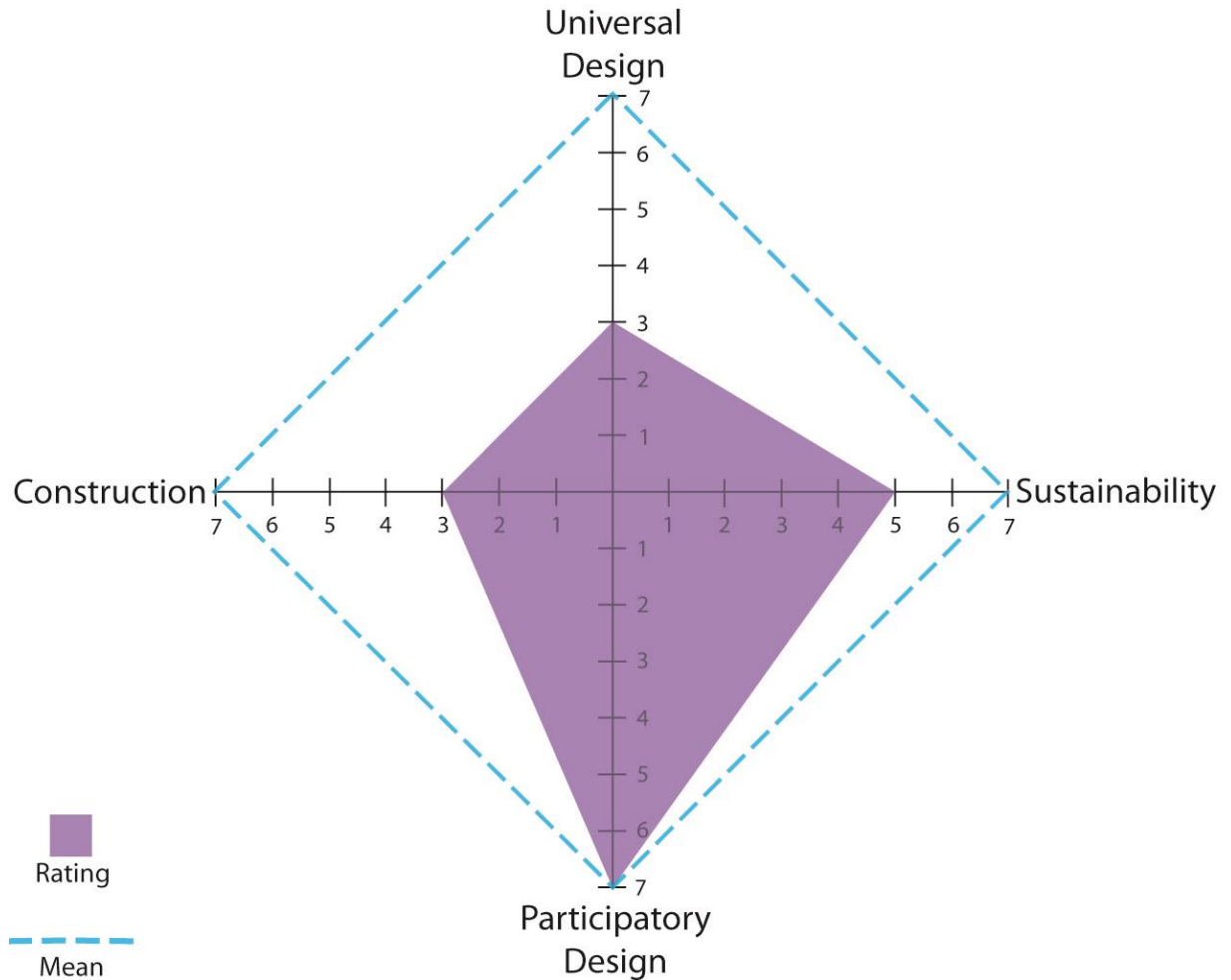


Figure 4.15: Review of Freedom Park, Cape Town, South Africa, according to the specified criteria (Author's construct, 2015).

4.2.2.4 *Local Example 4: Netreg Housing Project by DAG, Netreg, Cape Town, South Africa*



Figure 4.16: Housing developments in Cape Town, South Africa. The project is a development from DAG, which is based in Cape Town (Torkelson, 2009: 7-29).

Introduction:

The design consisted of semi-detached units and row houses for 191 families in a medium-density layout. Due to the financial restraints, each beneficiary would initially only receive a house that was 36m² in size; however, later in the project development, a strategic partnership assisted in developing slightly larger houses (42m²), which had added features, like a geyser, tiled roof, shower and a kitchenette. However, this partnership had a prerequisite with a positive spinoff, which was that the local community were used as workforce for the construction of the houses and that beneficiaries would be consulted on any decisions made regarding the housing (Torkelson, 2009: 21).

As the budgetary restrictions were severely limiting the type of development, the community had to choose between having the “one-house-one-plot” design and being relocated to the outskirts of the community, or having medium-density housing developments and remaining

within the community. Torkelson (2009: 28) says that the outcome of this option of choice, which was to remain within the community and receive medium-density housing, “demonstrates that, contrary to the dominant narrative, housing typologies and spatial planning frameworks can be challenged by finding higher-density models that are acceptable to low-income communities” (Torkelson, 2009: 28).

The specific requirements that needed to be met by the five housing designs that were presented to the community were the following:

1. Each unit needed a minimum of two bedrooms (this was specified as critical);
2. Each unit was required to have a front door and a back door (this was a requirement based on safety and security needs);
3. Space requirements: to install washing lines and/or accommodate horses (specific to the Netreg community, but not exclusively a requirement);

(Torkelson, 2009: 28)

DAG developed the housing designs after extensive consultation with intended residents through participatory design processes. This led to the final designs, which were not only accepted and endorsed by the community, but also financially viable. The design process was not only aligned with the residents’ needs but DAG incorporated the needs of the community as a whole and therefore made provision for home-based businesses, such as local shops and horse owners (each were given the opportunity to select plots in the designed community that would best serve their business needs). Torkelson (2009: 31) asserted that “Too many housing projects are still only defined in physical and technical terms”, while a specific outcome of this development was to illustrate how “social capital can be built, financial stability improved, and active democratisation achieved through the vehicle of low-income housing provision”. Therefore, even more critical to the design process for housing and the location of the businesses is the development of the community neighbourhood layout, which according to DAG had to “address critical social and geographical factors”, such as the following:

- Safety and security: Clear visibility of the streets was important to reduce crime and so the houses were designed to have large street-facing windows; the streets were designed as dead-ends to limit vehicular thoroughfare, thus making the streets safer for children to play in due to the reduced traffic and reduced vehicular speeds. Though these types of interventions were not enough eradicate crime from the area entirely, they did reduce the amount of crime taking place.
- Social inclusion: The location of the development played a large role in the social inclusion of the community, and therefore the development took place where

residents were currently living, which was in close proximity to public transport, schools, soccer fields, netball courts, playgrounds, churches and the community hall.

- Maintenance and cleanliness: Sewage and storm water drainage has always been problematic in the Netreg area, which is a health issue; the new development tried to overcome the problem, but it appears that the solution was neither holistic nor permanent and therefore, although the drainage is better than it was before the development, it is still a problem for the residents.
- Incremental upgrading: Although initial designs made provision for future expansions to the units, generally to a double story, the restricted budget had seen this requirement removed from the list when construction started. So, although provision was initially supposed to be made for upgrading and expansion, the houses were ultimately built without allowing for the possibility of structural extensions.

(Torkelson, 2009: 28-33)

Torkelson claims that it is due to the fact that the project was strongly community driven from the outset, that it is the reason that the community is still continuing to push for solutions to problems that arise. It was the community that requested that people be up-skilled in areas related to the housing development and the maintenance thereof, which again encourages the preservation of their houses and neighbourhoods in a good state. (Torkelson, 2009: 51).

Author's review and comments:

Active community participation was important for all the developers involved in this project, which meant that prospective residents were made aware of the responsibilities of ownership, such as the need for maintenance of the houses and their surroundings. Once the developers left the community, residents thus accepted these responsibilities. Similarly to Freedom Park, the people in this community were also the focus of the development work; in the case of Netreg, though, the quality of the houses that the residents received was better. The community and the developers had placed no emphasis on any ecological developments within the residential area or the surroundings, but economic benefits were high on the list of priorities, which again took cognisance of access to public transport and the incorporation of home-based businesses.

Certain design features that were used in the Netreg development are new to low-cost housing. This includes the layout and design of the roads within the development as well as the layout of the development to accommodate small home-based businesses.

Rating of review aspects:

Universal Design: The design of the development makes provision for schools and playgrounds, thus accommodating the needs of women and children, and is therefore rated as 3/7.

Participatory Design: Throughout the research on the housing development the term “consulted” was generally referred to within the context of participatory design; in terms of the current criteria, this would be rated as 3/7, which is participation by consultation. However, as people from the community were actively involved in the development of action plans as well as in capacity building, it met the criteria of involved Interactive Participation, thus garnering the project a rating of 6/7.

Construction: As the houses did not include any pedestrian infrastructure or additional nice-to-haves, the construction was only of an acceptable quality; but due to the number of houses being 191, the applicable rating for this housing development is 3/7 (which is the rating for 100 or more houses of an acceptable quality)

Sustainability: As a medium-density housing development that focuses on presenting community members with job creation opportunities, such as home-based businesses and shop facilities, as well as access to public transport, the sustainability rating for Netreg is 2/7, as it lacks components related to more sustainable construction materials, interventions to reduce and save water and electricity, recycling or waste facilities and ecological landscaping (see Table 7, section 3.7.1)

The graph for the Netreg development by DAG, according to these review criteria, is as follows:

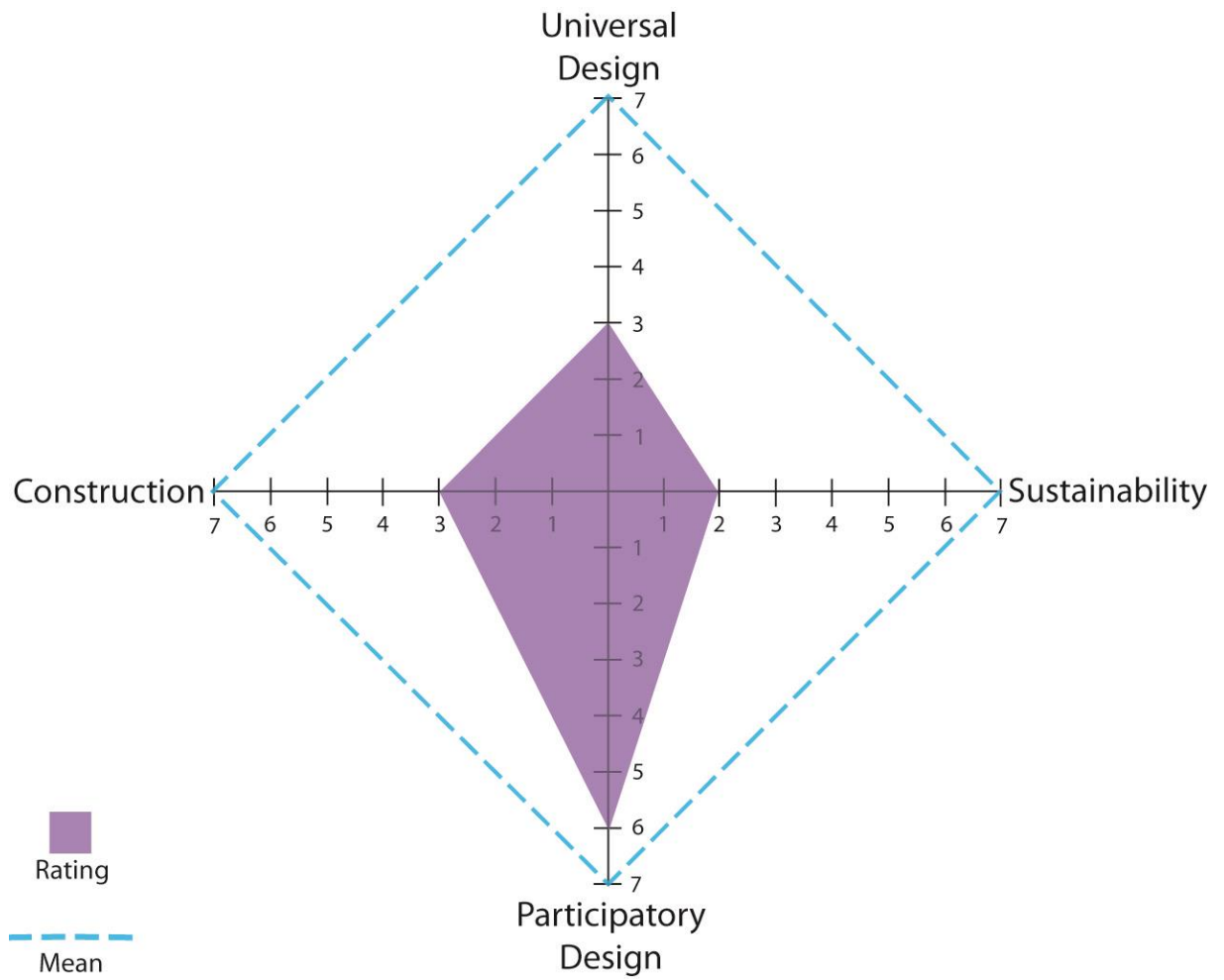


Figure 4.17: Review of Netreg, Cape Town, South Africa, according to the specified criteria (Author's construct, 2015).

4.2.3 Comparison and Discussion of Findings on Best Practices

In Sections 4.2.1 and 4.2.2, several international and local housing examples were reviewed in terms of the criteria as defined in Section 3.7.1. In this section, we are comparing the findings of the reviewed examples with regard to the criteria, and Table 9, below, summarises the results obtained from the analyses of the housing developments. According to the specified review criteria and the respective ratings per section; it also summarises the overall rating per housing development.

Table 9: Summary of ratings according to the specified review criteria (Author's construct, 2015).

	Universal Design	Participatory Design	Construction	Sustainability	Total
The Mean (optimal result)	7	7	7	7	28
Box House, Brazil	2	1	4	3	10
Social housing, Spain	4	2	6	4	16
Quinta Monroy, Chile	5	5	3	3	16
Monterrey, Mexico	5	5	5	4	19
Red Location, Port Elizabeth	6	6	7	4	23
Marconi Beam, Cape Town	3	7	3	2	15
Freedom Park, Cape Town	3	7	3	5	18
Netreg, Cape Town	3	6	3	2	14

The above table indicates how the selected low-cost housing developments performed in terms of the various criteria, as defined in the research, as essential components of inclusive and universally accessible low-cost housing developments. According to the results, the two examples with the highest overall ratings are Monterrey in Mexico and the Red Location in Port Elizabeth, South Africa, (both highlighted in bold in the Table 9) with total scores of 19 and 23 respectively. These are illustrated in Figure 4.18 below.



Figure 4.18: Examples of best practice, as defined through the rating process, are Monterrey Housing in Mexico (image on the left from ArchDaily, 2008) and the Red Location in South Africa (image on the right by H. Wolff, from Noero Wolff Architects, 2011).

To summarise, the two examples, as indicated above, are fairly similar in appearance; both paid particular attention to the accommodation of persons with diverse human needs within the design of houses as well as within the surrounding environment and the associated infrastructure, such as parking, pedestrian interfaces and economic opportunities. A housing design that is able to accommodate people with assistive devices and walking aids, as well as independent wheelchair users, is regarded as a type of lifespan housing, which increases the usability of the housing as well as being able to accommodate people through various generations.

In terms of the defined criteria, the particular process of design used was a type of PD known as Functional Participation, as the needs of the community for which the housing was being designed played a pivotal role in the design process.

Such an intense level of engagement with the community, in order to have a positive impact on the ultimate users of the development, and to contribute towards an increased quality of life for the duration of that development, has been found to be essential in fostering and maintaining a long-term sense of ownership: this is likely to encourage residents to do proper maintenance on their houses and the surrounding areas. It also results in the up-skilling and training of people in the community to equip them with the skills they need to preserve and look after the development and to create an internal governance structure for dealing with problems that the community might face, once the developers have left. Based on the Freedom Park and Marconi Beam examples, which rated the highest in terms of the predetermined assessment for PD, the skills should include masonry, carpentry, steelwork, painting and finishing, basic plumbing and electrical work, gardening and greening,

communication skills, management skills and basic documentation skills, such as filing, collating and note taking.

As previously discussed, there are two criteria in the section relating to construction in this research. The first criterion is quantity, which is based on the ever-growing housing backlog prevalent in South Africa and the need for large numbers of houses to be built as quickly as possible. The second criterion is quality, due to the generally poor housing conditions in South Africa. There have been many protests from residents of low-cost housing developments on the poor quality of the houses as well as the delays in providing sufficient numbers of houses. Both aspects of housing (quantity and quality) have been heavily protested against and should form part of the same deliverable to avoid the question of quantity over quality, which has generally been the theme around low-cost housing in South Africa, as the number of houses per development enjoys more attention than the specifications around the quality of housing.

Regarding sustainability, what is evident from the two best examples, is the consideration and use of sustainable materials, the conservation of rain water and the maximisation of positioning regarding the use of the elements of the weather, whilst at the same time considering opportunities for job creation, the location of the community in close proximity to or at least with access to city centres, and the existence of employment opportunities and skills development as well as providing people with opportunities to live and trade within the housing development.

Growing housing backlogs are not unique to South Africa, and protests related to housing occur around the world too. However, housing people in substandard houses could be interpreted as an infringement of human rights, as defined by the South African Constitution under the Bill of Rights (South Africa, 1996:7-39), Section 9 (3), which deals with equality and states that

“the state may not unfairly discriminate directly or indirectly against anyone on one or more grounds, including race, gender, sex, pregnancy, marital status, ethnic or social origin, colour, sexual orientation, age, disability, religion, conscience, belief, culture, language and birth”.

Similarly, Section 26 (1), concerning housing, states explicitly that “everyone has the right to have access to adequate housing”. Although “adequate housing” is a contentious phrase, as low-cost housing is intended to be a long-term solution and not a temporary measure, this housing should aim towards transcendence, as defined in Maslow’s Hierarchy of Needs. This can only be achieved through UD.

In order to define the physical design limitations that housing developments face in South Africa, tender No 218Q/2005/06, titled “Specification for Mitchell’s Plain Phase 1: Housing Project, comprising the Construction of 1648 Houses in Tafelsig and Eastridge” (City of Cape Town, 2006) was reviewed by the author as part of this research for this paper; this was the most recent, available tender for review in Cape Town (according to the City of Cape Town official from who the researcher acquired the original version of the tender, local tenders concerning low-cost housing was placed on hold due to the conflicts in requirements between legal documents on the requirements of housing- which is why this tender is referred to as the most recent). Two types of houses were specified in the tender document: house type 1, which has a total 30m² floor surface and is a detached house, also known as a stand-alone unit, and house type 2, which also has a floor surface of 30m² and is a semi-detached unit. Before the tender was published, the City of Cape Town conducted some initial community engagement in Tafelsig and Eastridge to determine the number of houses that would be required as well as the number of housing types. When presented with the two options, the community was split nearly exactly in half, with 822 households opting for house type 1 and 826 households opting for house type 2 (City of Cape Town, 2006: 40). As both housing types are single storey houses and located on a larger plot, and are thus not based on a high-density housing model, the design specifications for the development encourage land sprawl. This is problematic, given that people from the community are then located further from economic opportunities, major transport nodes (rail and main arterials) and social activities, as well as increased costs for people from the community for travel. Land sprawl also increases the distance that services such as sewage, waste, water and electricity needs to be extended to, again, increasing costs but this time to the municipality. This type of housing configuration also allows for an increase in the number of residents due to the less limited space for additional house extensions, which are not supported by the allocated services to the area. Informal settlements of the outskirts of a city, which get converted into further land sprawling housing developments, have the potential to become larger informal settlements with scattered low-cost housing dotted on the land and straining municipal services.

As both house types have the same floor square meterage, the requirements would be the same for both houses. As stipulated in the tender, the following structural aspects had to be completed as part of the contract:

- Foundations up to and including the floor slab
- Superstructure block work inclusive of door and window frames
- Roof structure and covering

- Ceilings, floor screeds, external plaster and paint, doors and ironmongery, glazing, sanitary fittings, plumbing, outside drainage and water supplies and other finishes.

(City of Cape Town, 2006: 43)

As part of the engagement with the community prior to the publication of the tender, the City of Cape Town divided the total area where construction was to take place into plots. Then, in the tender requirements, an ideal housing position on each plot was suggested, namely, “in the top left hand corner on each house type drawing” with “minimum distances from the side and back boundaries”, “positioned in such a manner so as to accommodate possible future extensions” (City of Cape Town, 2006: 45).

Thus, not only does the tender requirement define the housing type and size but also the positioning on the “plot”. Although it was recognised from the outset that occupants of the houses would require space for extensions to their houses, there is no means to limit or define such extensions, except for the plot size, allowing homeowners to build on the entire plot if they so choose, leaving them with no garden or open space around the house. It was thus anticipated that it would result in the construction of informal dwellings as attachments to the newly constructed houses, because there is generally sufficient space to build such extensions; apart from that, it was also recognised by the City of Cape Town that the original houses were most likely too small to comfortably house a single family. Therefore learning from international examples, housing developments need to be constructed to enable residents to construct extensions to their houses, but within parameters to prevent the over use of services and to prevent the formation of new informal settlements in areas where new housing developments have been constructed. The up-skilling of people from the affected communities is essential to enable them to construct good quality buildings safely (without causing possible injury to themselves or people in the surrounding area).

The construction of all houses, must comply with the South African National Building Regulations. There is mention of this requirement in the tender for Cape Town that was reviewed by the author which states that the “contractor may adopt any method of construction, which is consistent with the full requirements of this specification” (City of Cape Town, 2006: 48). The only provision was that the

“norms and standards for house construction are to comply with this Project Specification, the NHBRC’s Technical Standards as contained in its Home Building Manual Parts 1, 2 and 3, the relevant SABS Codes of Practice, the National Building Regulations and Local Authority By-Laws and all materials must either carry the SABS mark or must have an

equivalent performance which is fully described.” (City of Cape Town, 2006: 119)

In other words, the housing development is required to comply with SANS 10400 Part S, which is part of the National Building Regulations and deals with facilities for people with disabilities. Based on the review of the above-mentioned technical specifications for the houses, it appears that what is generally being built does not comply with this section of the Building Standards, even though the buildings are required by law to comply, whilst compliance would also be beneficial to a wide range of home owners. Although community engagement is strongly advocated in the tender requirements, these houses would essentially be the first securely constructed homes that some people from informal settlements would be living in; such first-time home owners would not necessarily be aware of the benefits of, for example, a slightly wider door or sufficient space within the bathroom. It is therefore recommended that certain aspects of UD be incorporated into the design requirements of tenders, which would be beneficial to residents and should not be left for the residents to request or specify as a requirement, neither should this decision be left to designers/architects/contractors who are not aware of the requirements of Part S of SANS 10400 (2011).

By comparison, precast, modular housing units, which are essentially constructed and designed in the form of building blocks, could be as large as 4.25 meters by 10 meters, amounting to an area of 42.5m²; this is larger than the housing developments from 2004, which were 36 m² in size, but smaller than the more recent 48 m² semi-detached social houses of 2013.

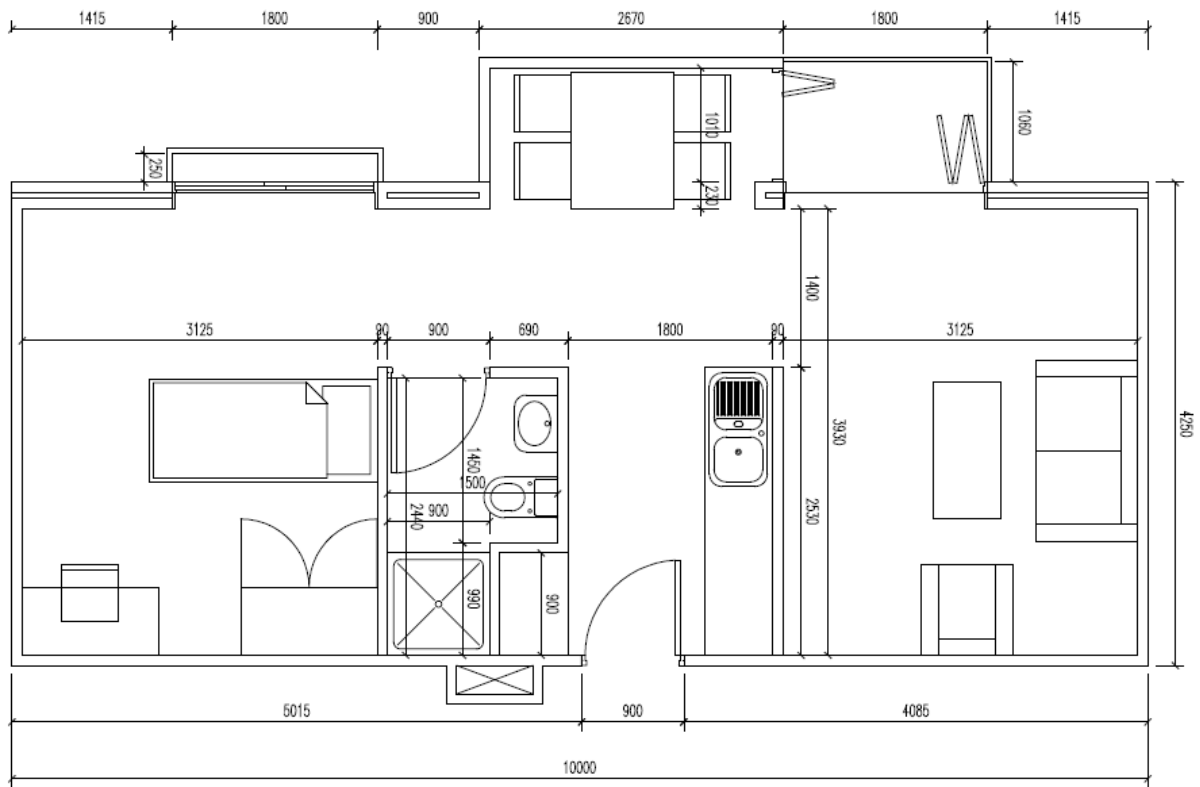


Figure 4.19: Example of floor plan of offsite precast, modular designed housing units. (Fitzhenry, 2010).

All the plumbing and electrical fittings are cast into the four external walls, which reduces costs as well as the timeframes that are associated with construction onsite. The total square meterage of the cast unit is 42.5m². Also illustrated in the floor plan is the ability to easily make light-weight attachments that could be fixed to the standard house to increase the volume area- seen in the balcony/dining room extension. Internal walls are dry-walling and can therefore be custom-built and specified by the owner before construction. (Fitzhenry, 2010) The following image illustrates the layout of many units as illustrated above to form a complex of housing units as well as additional services or spaces allocated to multifunctional use.

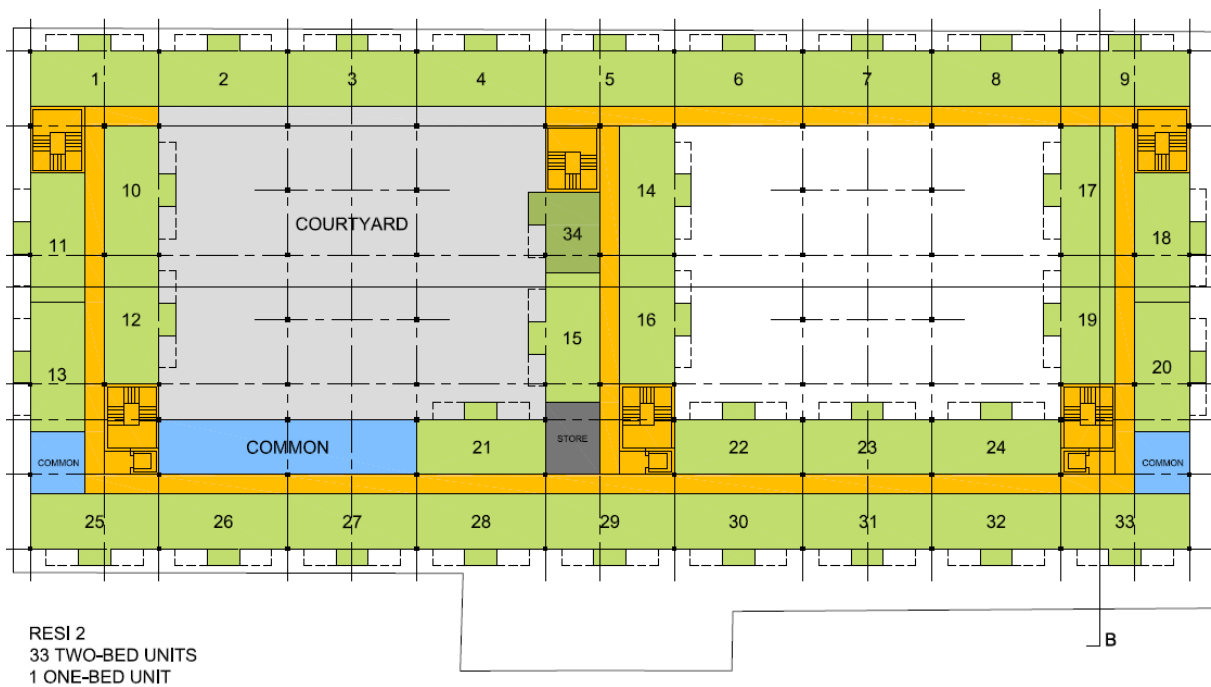


Figure 4.20: Ground floor plan and second floor plan of the student residence constructed, using the configuration of precast building blocks. (Fitzhenry, 2010)

The design incorporates a total of 970m² of commercial space, 175 house units (5 single bedrooms and 171 double bedrooms), 187 parking bays, 2 loading bays, 22 motorcycle parking bays and nearly 300m² of common area, across all the floors. (Fitzhenry, 2010)

Due to the width of the door as indicated in Figure 4.19, the units are all easily accessible to people with various limitations; however, that was not the actual reason for the increased size of the door. The major consideration for the increased door width was that, since the whole house was cast in one piece, all the fittings for the house that were retrofitted had to be moved into the house mainly through the front door; a larger door made this possible. Although the bathroom facilities are not the required dimensions according to SANS 10400 Part S, the required clear space of 1.5 meters by 1.5 meters could be achieved internally with minor reconfigurations of the current layout. This would allow for more manoeuvring space within the bathroom and would thus benefit residents. Internally, the space allocation is sufficient for ease of movement, and allows for the easy use of the space and all the facilities. Although residents may not necessarily notice that all of the doors are wider or that the internal space is more manoeuvrable, they would notice that the area feels comfortably spacious. The common areas and commercial areas furthermore increase ease of movement throughout the building and contribute to a better neighbourly environment, as people are more likely to get to know one another. Although this development did not go through a PD phase, attention was paid to the residents' needs and requirements from this environment, and the general design meets most of these. In addition, the development is in a good location, with increased population density and improved access to community services and facilities, as well as reduced timeframes through more efficient construction methods. It is argued herein that such a construction method could potentially meet the ever-growing need for housing in South Africa and, over time, eliminate the backlog.

UD in this context is therefore essentially the type of conscious design and development that contributes to a meaningful society. This would include regular consultations, engagements and interactions with the people who are part of the design outcomes and who stand to live in these developments. Minority groups within a community should have a strong voice, as they are the most vulnerable within a society; by meeting their needs, it is envisaged that the community will be more cohesive, more aware, more sustainable and more accessible, all of which results in a safer, friendlier and united community.

One of the aims of the research was to identify factors relating to the lack of practice and implementation of UD within the low-cost housing sector. This required two approaches: one top-down (professionals enforcing at least the minimum standards as described in SANS 10400 Part S) and one bottom-up (proposed residents of a new development need to voice the requirements of the more vulnerable members of their communities). In Section 4.2.1 above, the findings on international best practices as well as some of the requirements from housing tenders (see Section 4.2.3), indicated the need for UD within the social housing sector through PD, but this leaves the top-down approach unanswered as there is no

stringent requirement for professionals to employ Part S of SANS 10400. It is therefore essential to know what the local professionals, who are driving these projects, are doing to incorporate UD within the low-cost housing sector. This will be the focus of the next section.

4.3 Qualitative Results from Industry Professionals

As housing developments involve so many different aspects, professionals from diverse fields of speciality formed part of the research group. Areas of speciality of those who were chosen had to include UD, low-cost housing development and architecture. These three areas were considered to be applicable to the application of UD, the use of PD, the construction of housing developments and the sustainability of such developments.

As part of the primary research, the current status of the application of UD in the public housing sector had to be determined. Of the initial eight professionals who were interviewed, only five interviewees agreed to the publication of their interviews as part of this research. Table 10 summarises the results of these initial interviews.

Table 10: Percentages of interviewed professionals and their degree of knowledge of Universal Design, Part S of the National Building Standards and Participatory Design (Author’s construct, 2015).

	Never heard of it	Familiar with it	Advocate
Universal Design	60%	20%	20%
SANS 10400 Part S	40%	60%	0%
Participatory Design	0%	20%	80%

The findings indicated that most of the professionals who were interviewed had never heard of UD before and were not familiar with the terminology. However, the majority were familiar with Part S of the National Building Standards, which relate to facilities for people with disabilities. An overwhelming majority of the professionals were in fact advocates of PD. The terminology “UD” is therefore not very widely known, although the concept of designing for people with diverse human needs and the concept of designing to encourage social inclusion are common place within this context. Thus, although the *concept* of UD is not often mentioned, the *practice* of design for all is more common than expected; however, it is only implemented when there is a drive to use PD in a particular project. Although PD is an essential component of UD, there are certain design features that would be more beneficial to users if they were incorporated in the design process and not left to the user to define.

Once UD and the range of beneficiaries of such an approach were introduced to the professionals, they readily grasped the concept of designing to better accommodate all users within a set of design parameters. All the participants indicated that they had a better understanding of UD and whom it benefited after the interview discussions; 60% of the

interviewees clearly indicated that UD is a design element that would be beneficial to their own work and that they would consider applying it in future.

When they were asked how the application of UD could be made more mainstream, the majority vote (40%) suggested that it should be left to the architects/designers and the construction team to consider designing with UD as a show of goodwill. The difference between the SANS 10400 Part S and UD should be emphasised here because SANS 10400 Part S, along with PEDPUDA, are regulatory obligations, and must be adhered to (whilst currently there is a lack of means to enforce the legislation as there is an overall lack of technical information to provide architects/designers and constructors with the exact requirements) but UD is an overall way of thinking that encompasses people of a variety of human needs. Two of the interviewees (20%) then voted for the application of UD to be incorporated as legislation, another two suggested that it should be enforced through a penalty structure, and two voted for the enforcement through incentive based application.

Thompson suggested that the application of UD has thus far been based on goodwill, mainly due to the lack of ability, on the part of government, to ensure its application; this has meant that UD has been rarely and inconsistently applied. A stronger drive for the use of the values of UD should be incorporated to ensure that it is more widely adopted to make a difference in the housing sector. All sectors, including environment, services, products, transport and infrastructure, require the application of UD to design more inclusively, and this can only be achieved through proper education (Fransolet & Thompson, 2013).

Having reviewed the tender requirements for housing, as well as having obtained the opinions of the professionals who are generally responsible for executing such tenders, the link between the understanding of PD and the emphasis in the tender requirements has become clearer. The professionals who are responsible for fulfilling tenders are more likely to understand the terms “community involvement” and “participatory design”, because the tender requirements have a strong focus on these elements, and they thus form the basis on which tenders are awarded. Coetzee suggested that the responsibility of the application of the National Building Standards should be placed at the door of both the architects and the clients, as they are responsible for signing off on projects during the conceptual phases (Fransolet & Coetzee, 2013). This implies that the education around UD should be emphasised and included in various sections of applied learning through tertiary education.

As Part S of the National Building Regulations is already a prerequisite for compulsory compliance in the construction of houses awarded through tenders, and as there is already a strong emphasis on community involvement in the tender documentation, it is suggested that

the workings and values of UD be incorporated into the tender requirements and that the section in the building regulations specific to persons with disabilities, Part S, be emphasised to ensure compliance.

As with PD and its inclusion in the tender requirements, an approach that incorporates the use of penalties for non-compliance and an award for their application, the tender process is the most likely means to start seeing the results of the application of UD and to increase the levels of awareness concerning UD within the context of low-cost housing.

Through Interactive PD, build high-density, well-designed and good quality houses, which allow the residents and home owners access to economic opportunities and to live in a more sustainable manner; housing developments that meet more than just the basic human needs (as defined by Maslow's Hierarchy of Needs) is achievable. Through the findings of this research it is identified that proper and holistic housing solutions could assist people to the top of the pyramid, viz. to Transcendence. A holistic home, precinct and community design and construction would meet basic safety needs, encourage a sense of place, thereby increasing their responsibility, which could lead to increasing knowledge and giving meaning and purpose, encouraging the residents and owners to maintain the aesthetics of their homes and community and finally to assisting others in achieving the same status, viz. by achieving Transcendence (Refer to Figure 2.5, Chapter 2).

The MDGs for 2015 should be reflected upon in the light of what has been provided in terms of low-cost housing as “through the RDP, a commitment was made to meet basic needs” (United Nations Development Programme South Africa, 2013b). The MDGs that could be addressed, to some degree, by the design and development of low-cost housing communities that meet the social-technical needs of the community would include: the eradication of extreme poverty and hunger, universal primary education, the promotion of gender equality and empowerment of women, the improvement of maternal health and environmental sustainability (Refer to Figure 2.6, Chapter 2). Similarly, the findings from John S. and James L. of the Knight Foundation (2010: 10) suggest that education and the possibility for earning an income locally are some of the important factors when developing attachment to communities; they also highlighted the importance of caring for children (and the elderly) within a community. These all form part of the requirements that have been listed in the outcomes of this research.

4.4 The Needs of People Living in Low-Cost Houses

As identified in Table 6 of Chapter 3, participation by consultation was the means through which this information was collected, which means that the people from the housing

developments participated in the research by being consulted and the author modified their findings to reflect the input from the participants. The consultations were conducted during house visits to the developments in order to perform universal access audits. In total two universal access audits on low-cost houses were conducted and a third housing development was reviewed from plan and a drive through the construction site. These consultations were not with people with disabilities, but with mothers who had children or grandchildren whom they were taking care of. According to the plans as reviewed for the Ocean View development, out of a total of 543 houses, two were assigned specifically for people with disabilities, which results in a grossly under estimated 0.4% of the total number of people anticipated to be living in the development. As both people with disabilities and people with young children are specific beneficiaries of UD, it is concluded that the resulting findings would benefit, not only people with young children and people with disabilities, but the majority of people in low-cost housing, in accordance with the listed beneficiaries of UD. These findings therefore gave insight into the needs of the people who are currently living in low-cost housing developments and the findings were a result of questions relating to the most prominent issues that people living in the houses experience. Reviewing the diagram in Figure 2.5, which depicts Maslow's hierarchy of needs, the following findings can be categorized accordingly, starting with the most basic needs, defined as *Biological and Physiological needs* and then culminating with *Self-actualization* and *Transcendence*. The identified needs are subsequently categorised as follows:

Biological and Physiological needs

- Access to services, such as water, sewage and electricity
- Safety and security within the housing area/community
- Well-constructed houses
- Safety and security for the elderly

Safety needs

- Access to medical services, such as clinics
- Sufficient street lighting
- Child safe areas
- Safe pedestrian and bicycle routes

Belongingness and Love needs

- Opportunities for trading

Esteem needs

- Access to transport

Cognitive needs

- Ability to save money on household expenses through ecological design

Aesthetic needs

- Clean neighbourhoods

Self-Actualisation

- Access to education opportunities
- Expansion (either the limitation thereof or the allocation of space for it)

For a copy of the full housing audit that was conducted on the two housing developments as indicated above, please refer to Appendix F: Universal Access Review, as reviewed by IDC Consultants. The review of the housing development plan and photos of the drive through the construction site are presented in full below in Section 4.4.3 *Universal Access review of Housing development, constructed in 2014: Ocean View*.

To serve as an overview of the findings, the following excerpts have been taken from the main audits that were conducted onsite as well as the full review of the development from the drawing plans.



4.4.1 Audit of House constructed prior to 2004: Macassar

This audit was conducted in Macassar (outside Sommerset West, Cape Town) on a development of housing that was built in 2003. The plot size on which the house is situated is approximately 160m² while the house takes up a mere total of 36m². This house is home to a family of six, which includes two children under the age of six years and has additional backyard dwellings built on the land to accommodate the ten extended family members.

Within the area in which the house that was reviewed was located, there was a small shop as well as a children's day care which were also reviewed as part of the this auditing process as these are both located within converted housing developments of the same size as the house that was reviewed.

Due to the year in which this development was constructed the SANS 10400 Part S version that was applicable to this set of buildings is the 1999 version and so this audit was conducted on these sets of requirements but as these requirements were lacking in detail, other aspects that affect accessibility have been added to the this review process. The follow table, Table 11, serves to illustrate some of the findings during the audit.

Table 11: Overview of the findings from the Universal Access Audit that was conducted in Macassar (Author's construct, 2015).

Onsite Images	Compliance and Observations
 <p>Onsite Image 1: Street access to residential areas.</p>  <p>Onsite Image 2: Street access to the main road from the residential area</p>	<p>A lack of pedestrian infrastructure makes navigation through the area increasingly difficult. With no proper verge along the edge of the roads, pedestrians are forced to share the road with vehicles; although only a limited number of vehicles pass through this area, vehicles have the right to the road, making this area specifically dangerous for children and vulnerable members of the community, such as the elderly and people with various limitations. Levels of street lighting are low, which could increase the occurrence of crime in the area. The conditions of the road surface in certain areas are dangerous for vehicles due to potholes or areas where the road has been damaged during service delivery protests (burning tyres).</p> <p>Throughout the area, it was observed that there are high levels of activity along the main routes of vehicular traffic (including along the highway-N2), where runners and joggers are seen along all the routes. The runners include small children as young as 10 years of age as well as older runners and people who are obese</p>



Onsite Image 3: Street access to the house.

Access to the house is restricted, once again, by the location of soft sand between the road surface and the entrance of the house. SANS 10400 Part S of 1999 required that trafficable surfaces be stable, firm and slip-resistant; surfaces that do not comply with this requirement make it difficult for people in wheelchairs, the elderly and small children to navigate this area.



Onsite Image 4: Entrance door to the house where the residents have built an extended stepped access to allow small children easier access to the house.

The foundation of the house has been raised by an estimated 250mm from the level of the road surface; it may be that this was done due to water drainage levels. However, it also meant that the house now has a stepped access at the door of about 200mm. According to SANS 10400 Part S of 1999, wherever stepped access is provided, the riser of the step must be less than 170mm, and an alternative means of access must be provided too. Steps prevent access to the house for people who use wheelchairs and also make it more difficult for the elderly to enter the house.

In this case, as the residents have small children, they have built an extended step to give the children independent access to the house.



Onsite Image 5: Toilet facilities are in the form of an outhouse.

Toilet facilities were not included in the house plans; instead, a stand-alone toilet cubicle was installed in the corner of the property. The toilet is not accessible by mobility impaired individuals because it is very small, located across a sand walkway and accessed by a step. These limitations also restrict the use of the toilet by small children who require assistance as the toilet is only just sufficiently big enough to accommodate one adult. The toilet facilities do not include any personal washing facilities, such as a bath or a shower or not even a hand-basin. Residents thus make use of an aluminium bath tub, which they place somewhere in the house and fill with some water for washing.



Onsite Image 6: The local shop at a house converted for the shop.

The heavily fenced-up shop is open until late at night, and sells all manner of items needed by the community (convenient groceries, household items, snacks, etc). The shop was built as an extension to the originally provided house. The window that is used as the serving counter is located at normal window height, which is 1.2 meters from the floor level. The floor finish at the serving counter on the outside is loose gravel and sand, and thus it is difficult to navigate by people with physical disabilities and would generally be avoided by women in high heel shoes. SANS 10400 Part S of 1999 requires that trafficable surfaces are stable, firm and slip-resistant, as surfaces that do not comply make it difficult for people in wheelchairs, the elderly and small children to access such an area.



Onsite Image 7: Internal rooms of the pre-school.

The house that was converted to the pre-school still has the exposed beams without a ceiling. The owners have installed lighting in some of the classrooms but the levels of lighting are very poor, given that this is a place of education.



Onsite Image 8: One of the classrooms that was originally a bedroom.

In terms of physical access to the school, once again the soft sand at the entrance makes access to the entrance door difficult; this is further hampered by the location of the concrete slab outside the entrance door, which has a ramp that by no means complies with requirements as set out in SANS 10400 Part S of 1999. Once the first step is accessed, the step into the pre-school has a rise of 200mm, making access to the school difficult for even the children attending the school as well as for parents who are bringing smaller children in prams.

The houses were evidently of poor quality, as walls had started to crack and sections of the buildings were falling down. This could be attributed to the poor workmanship of the original construction, as well as to the poor maintenance efforts from the owners of the houses. The maintenance issues might have been overcome through skills transfer, but this was not part of the tender requirements when these houses were constructed. In terms of workmanship, even though it is possible that the original tender requirements specified that quality houses had to be constructed, the definition of the term 'quality' varies, depending on the contractor. It is unclear if there had been the same kinds of detailed specifications with regard to the concrete and the building materials, as we see in the requirements of more recent tenders.

The layout of the houses on the plots is similar to what has been specified in the recent tender specifications. As argued above, this approach encourages land sprawl and pushes low-cost housing to the further outskirts of the cities; as can be seen in the first two images, it also creates sparse areas (vast open areas with no lighting) that could decrease the safety of the environment as it could encourage loitering and possible associated crimes as well as encourage the construction of informal dwellings.

The designs of the houses are not user friendly or community friendly, and have no consideration for sustainability or for integration of the community. There are no common areas, there are no green areas, there is no provision for pedestrian routes (and walking is the most common means of transport); there are no safe areas for children to play and for adults to exercise (adults and children are often seen running for fitness along the highway near this area). Moreover, the house design makes no provision for the large number of micro businesses that originate in areas where low-cost housing developments are constructed.


4.4.2 Audit of Houses constructed in 2013: Flamingo Vlei

This review was conducted in Flamingo Vlei (along the M5 towards Muizenburg, Cape Town) on a new stretch of land that was previously demarcated a section of the Zeekoei Vlei Nature Reserve. Construction of the development started in 2013. The plot size on which the house is situated is approximately 72m² while the house takes up 48m². This house is home to a family of four, which includes two children under the age of six years.

Within the surrounding area mass construction was being undertaken for the construction of a mall as well as a continuation of the housing development. The home owner of the house that was reviewed has been on the waiting list since 1997 and was granted occupation in April 2014.

Due to the year in which this development was constructed the SANS 10400 version that was applicable to this set of buildings is the 2011 version and so this audit was conducted on these sets of requirements but as these requirements were lacking in detail, other aspects that affect accessibility have been added to the this review process. The follow table, Table 12, serves to illustrate some of the findings during the audit.

Table 12: Overview of the findings from the Universal Access Audit that was conducted in Flamingo Vlei (Author's construct, 2015).

Onsite Images	Comments and observations
 <p>Onsite Image 9: Sandy access to the entrance of the houses can also lead to excess dirt in the homes</p>	<p>There are no house numbers or street names. Navigation through the housing development is thus confusing to newcomers, as all the units look the same. If residents were more easily able to identify their own homes, it is argued that this would increase the level of ownership and pride in the community. There is still construction happening in the area, but as home owners have already started moving in, the audit focused on the current conditions of the housing development.</p> <p>Access to the house is restricted, once again, by the soft sand between the road surface and the entrance of the house. SANS 10400 Part S of 2011 requires trafficable surfaces to be stable, firm and slip-resistant so that they can be easily navigated by people in wheelchairs, the elderly and small children.</p> <p>There are no street lights, which decreases safety and security.</p>



Onsite Image 10: Paved pedestrian walkway between houses to the central parking area.



Onsite Image 11: Central parking area with drainage in the centre of the lot and directly along the walkway leading to this area

Incorporated into the development is a community area, which doubles up as a car park for those who have vehicles. Walkways leading to this area, as indicated in Onsite Image 10, are wide enough to accommodate strollers and children on bicycles as well as wheelchair users.

The walkways lead to connecting road surfaces, on which there are no painted or raised pedestrian crossings or dropped kerbs (which would allow access to the graded surfaces complying with the requirements to facilitate access), making access to the community area and walkway problematic. Dropped kerbs and the creation of accessible parking areas are specified in SANS 10400 Part S of 2011. As this area is also a communal parking lot, it must have at least one accessible parking space (SANS 10400 Part S of 2011), but this is not the case. However, as the parking spaces have not yet been painted in this area, it could still be easily integrated into the layout.

The community area has several planter boxes, which are intended to encourage the people of the community to grow their own plants or vegetables in this area. However, it is assumed that, due to the location of these planters in the parking lot, they are more likely to become communal braai areas, which meet the community's requirements. The common area also has drainage in the centre of the area; SANS 10400 Part S of 2011 requires such drainage to be relocated, as it is in the path of travel, as seen in Onsite Image 11, where the pedestrian is walking straight along the drainage channel.

Due to the costs associated with the relocation of the channel, another option would be to cover it with a level grating in compliance with the regulations.



Onsite Image 12: Stepped access from homes leading to the parking area

Houses with doors that lead onto the common area have a stepped access from the common area that was built in during construction as seen in Onsite Image 12. Better access could easily have been achieved here by installing a ramp. If it is assumed that the rise of the two little steps to the door entrance is a total of 150mm and the distance between the house and the common area is 1.5m, the gradient of the ramp would be 1:10; this is less than ideal but still compliant with SANS 10400 Part S of 2011. However, if the total rise of the steps is more than 150mm, and the distance from the common area remains at 1.5m, a somewhat steeper gradient of the ramp would be less important than the ability to gain access to the houses. SANS 10400 Part S of 2011 requires ramps to have landings at both the top and the bottom of the ramp, prior to any doors or windows, which given these space constraints would not be possible but if it was considered before construction this could have been achieved or the design altered to mitigate this requirement. Discussions around the floor level should have been held prior to construction of these houses, which could have resulted in reduced floor level heights.



Onsite Image 13: Stepped access at the entrance to a house, which has a rise of more than 170mm; this does not comply with SANS 10400 Part S of 2011

Houses located along general pedestrian routes and main vehicle routes also have stepped access at the front door, but here it is treated differently to the surroundings of the common area. These houses have a 170mm (or more, in some cases as much as 250mm) stepped access at the front door. However, SANS 10400 Part S of 2011 requires that a stepped access is not more than 170mm.



Onsite Image 14: Various solutions have been put in place at the houses to overcome the sandy entrance and the high step at the entrance.

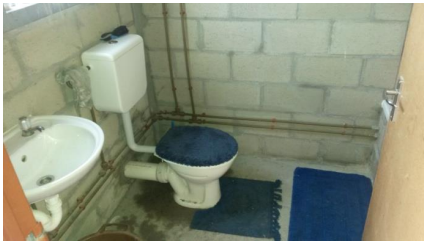
In some cases, the households have made modifications, as best as they can, to overcome the problem caused by the step outside their front doors. Neighbours have also admitted to leaving prams outside during the day, as carrying them indoors many times a day is not feasible. Some residents have used bricks from the surrounding area to extend the stepped access to the houses to better assist in entering the houses.

Without the extended step at the entrance, the location of the lock on the door is too high to be easily used by home owners,



Onsite Image 15: Loose bricks are scattered near the entrance to houses to help residents navigate the sandy routes around the houses

which is another reason for the extensions of the step to the entrance.



Onsite Image 16: Toilet facilities have all of the piping exposed, which does not comply with SANS 10400 Part S of 2011.

SANS 10400 Part S of 2011 requires that the exposed plumbing be covered and protected to protect users against injury. As indicated in Onsite Image 16, the exposed pipes are left unattached and do not penetrate the ceiling, to where it is assumed that the geyser would be connected (at the time of the audit the geyser had not yet been installed).



Onsite Image 17: Exposed piping that is assumed to be connected to the geyser, although this has not been installed, even though it is part of the building contract

The door opening and the location of the bath make it impossible to open the toilet door fully. SANS 10400 Part S of 2011 requires that the clear opening width of the door be a minimum of 750mm, which could be achieved if the door was allowed sufficient space to open completely.

The internal configuration of the bathroom does not allow sufficient manoeuvring space internally due to the location of all of the amenities. SANS 10400 Part S of 2011 requires a clear internal space allocation of 1.8 meters by 1.8 meters. Locating the basin towards the front of the toilet, rather than next to it, would also be compliant with SANS 10400 Part S requirements.

In many cases, the residents would have preferred a bath in the bathroom, because it is easier for children to use. However, if a shower with an additional lowered tap was installed, it would allow for children to bath in small tubs inside the shower cubicle, and it would allow for adults to save water when showering instead of bathing.



Onsite Image 18: The children's play area between the houses was constructed by one of the neighbours for the neighbourhood children, as none had been provided by the developers

Safe and secure facilities for children within the community are essential. In this case, residents acknowledged the need and took the matter into their own hands, constructing a play area for the children. The location of the play area is in a space where it could be observed by multiple housing units at the same time. This adds to the safety and security of the play area, as parents are able to monitor what is happening in the area.

By providing a play area for the children, the parents are also ensuring that the smaller children are not playing in the streets, where they cannot be monitored and where they might get hurt by passing traffic. This leads to a better and safer community.



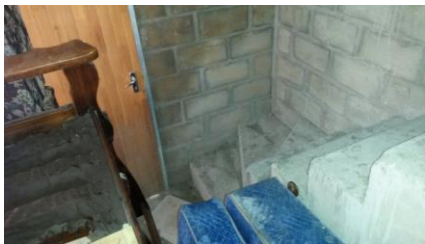
Onsite Image 19: Entrepreneurial activities (a small shop) take place within the small confines of the semi-detached houses

Community members report that numerous residents run small entrepreneurial businesses, ranging from small-scale vendors to seamstresses. The home owners are dependent on the income from these businesses, and the planning and layout of these houses should have taken this into account.

Although it is not always possible to incorporate all of these types of developments within the community, a decision could have been made to facilitate these processes through a design intervention, in which the corner houses, for instance, could have been allocated to existing entrepreneurs or people who are interested in starting a small home-based business. The overseeing body of the community is very strict in terms of what behaviour is deemed acceptable in the community and security is well enforced. However, informal trading is bound to exist in areas, where people are some distance from any formal trading facilities. It is therefore suggested that the corner houses in each area be dedicated to these types of activities to create a more formal means of trading for such small businesses



Onsite Image 20: Mixed housing developments increase the density of the area and reduce the distance over which municipal services need to be provided, such as sewage, waste removal, water and electricity.



Onsite Image 21: The location of the stairs in relation to the back door

Mixed housing developments within the community increase the density of the area and reduce the distance in which municipal services are required (sewage, waste removal, water and electricity). Although such houses have the same square meterage as the semi-detached single storey houses, residents rather opted for single floor houses because the location of the staircase inside double storey houses effectively reduced the available space, which is an indication of bad design.

As a result of the above reasoning, the double storey houses that are complete and ready for occupancy are in fact being used as unofficial storage spaces by people moving into the single storey houses. These problems could have been overcome and residents might even have chosen the double storey houses over the single storey units if the houses had been made slightly bigger

This social housing development is an indication that improvements in low-cost housing developments are providing a good living space for new home owners. The use of mixed housing is presumably the result of additional efforts from local government to encourage mixed income groups to live in a single development, rather than isolating the very poor to the outskirts of the city, as has happened in the past. This issue has been addressed as part of the BNG policy of 2004, which has thus far rarely influenced housing developments.

This particular development also has a unique governing organisation that is run from within the development; it ensures that home owners abide by the rules that have been set for the area. For example, no additional, informal structures may be erected within the confines of the development. Residents also report suspicious behaviour and loitering in an attempt to oust crime. Initiatives such as this build a strong community and assist the residents in taking ownership of their houses and the surrounding area and in taking pride in what they now own.

Although the development achieved some goals that are essential in creating the kind of community environment where people take ownership of their houses, access, in terms of UD, would have further increased such levels of ownership; it would also increase the

accessibility of the houses and the surrounding environment, making lifespan housing in this development possible. This is essential in encouraging people to take pride in their housing communities, because, as residents grow older or move through a different life phase, such as having children or having a temporary disability (e.g. breaking an arm or a leg), they would still need to and should still want to live in their current houses, where they have established relationships within the community.

4.4.3 Audit of Houses constructed in 2014: Ocean View

It would have been preferable to conduct an onsite audit to determine if these houses had been constructed according to plan. However, due to development being under construction, the reviewer was not able to gain access to the constructed houses and therefore the audit was conducted mainly from the approved plan drawings for construction and which why the layout of this review is different from the two listed above.

This housing development is being constructed in Ocean View (Mountain View), Cape Town, and construction started at the beginning of 2014. Local materials (such as sand and stone) were used, and links to future public transport systems throughout this development were considered (planned Bus Rapid Transit for this area in future) but it appeared that the social context of this community did not play a significant role in the design process. It is also not clear to what degree the community was involved in the design process or in the construction or in the skills transfer.

Each two-bedroom unit covers a total area of 40m², with only one entrance door to each house. The housing plan that was reviewed in this research was of house Type D; although it is assumed that there are at least four types of housing, this is not clear, and the other housing types were not reviewed as part of this audit, which is a shortcoming of the research as only a portion of the development was reviewed.

The SANS 10400 version that was applicable to this set of buildings is the 2011 version and thus this audit was conducted based on these sets of requirements; however, as these requirements were not sufficiently detailed, other aspects that affect accessibility were added to this review process.

This review has been evaluated by IDC Consultants.

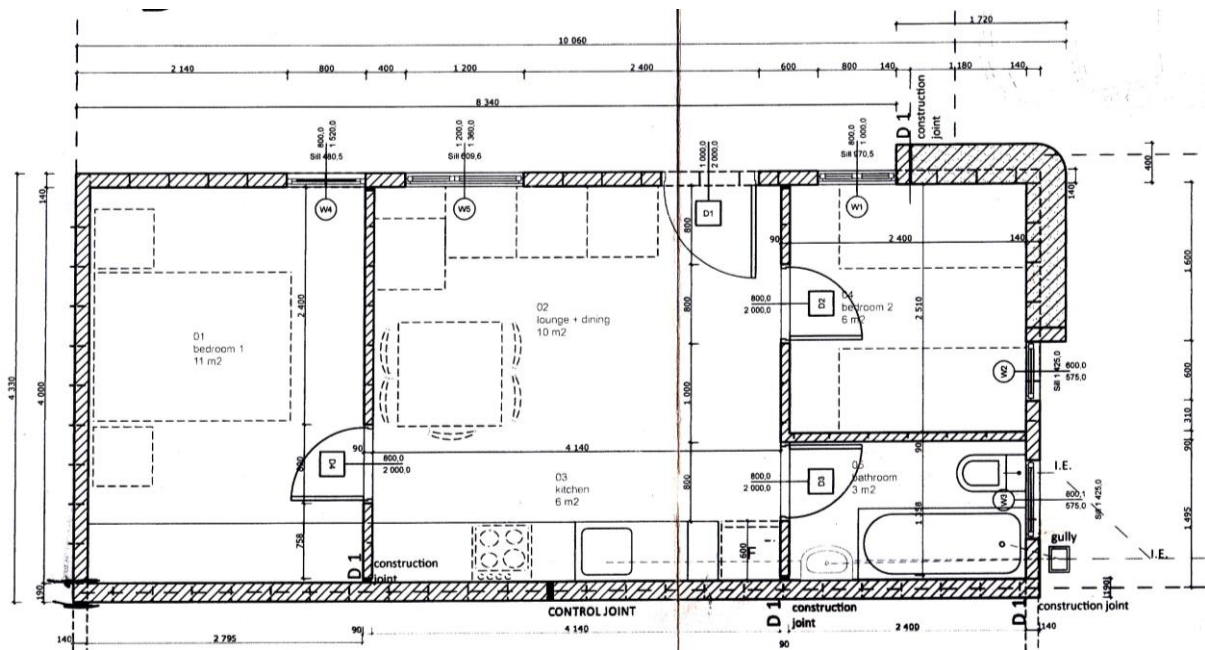


Figure 4.21: Plan drawing of the houses that were planned for the Ocean View social housing development, constructed during 2014 (Drawing issued for construction, in the possession of the author).

Comments and Observations from the plan drawing


- The entrance door that is specified on the plan has a width of 1 meter, which complies with best practice, as it is more than the required width indicated in SANS 10400 Part S.
- On the drawing plan, there is no indication to suggest that there is a step located at the entrance to the house. Vertical change in level at the entrance threshold should be at the minimum to allow easy access to the houses.
- The width of the bathroom is specified in the drawings as 1.3 meters by 2.4 meters. Although 2.4 meters in length is more than the required 1.8 meters according to SANS 10400 Part S, the width of the bathroom (1.3 meters) does not leave sufficient space for manoeuvring internally. According to the SANS requirements for access to facilities for people with disabilities, the bathroom requires sufficient clear space to enable an individual in a wheelchair to perform a 1.5 meter turning circle internally. Through minor reconfiguration of the second bedroom and the bathroom, sufficient internal space could be created, but access would also depend on the installation of a shower instead of a bath. Similar to the social housing development in Flamingo Vlei, a shower with an additional lowered tap would allow smaller tubs to be filled for the bathing of children.
- Due to the size and location of the front door, the doorway to the second bedroom is smaller. This could be better aligned and the internal space of the second bedroom could be better utilized, if the bedroom door was relocated to be nearest to the bathroom. This would have allowed free access through both doorways.
- Due to a lack of specifications and details on the drawings, it was not clear to what degree the residents are required to complete their houses. A ceiling has been specified

on the drawing as well as four lighting points. It is assumed that one light point would be fixed per room. Similar to the previous housing developments, however, there are no light in the kitchen area, but rather sharing light from the dining area.

- According to the site layout, two houses were intended for use by people with specified disabilities. At the time of the visit, it was not possible to view the one house that had already been constructed and the other house had not yet been built. In relation to what was seen in other areas throughout the development, however, the ramps at the entrance to the houses that are 'earmarked' for people with disabilities would have to be 3 meters in length, if the rise at the entrance was the average 250mm from the floor level, and the gradient of the ramp was the maximum gradient of 1:12. In cases where the vertical rise is 170mm (which is the maximum vertical rise per tread), the ramp would have to be 2 meters in length for the minimum gradient of 1:12. This comparison makes it clear that the entrances of the two houses need to be at a lower level. And given that any residents could experience a form of physical limitation due to age, pregnancy or an accident, the entrance level should in fact be lowered and made consistent for all the houses.
- The installation of lights for the external circulation routes have also not been specified but the lack of supporting infrastructure suggests that no additional lighting has been planned in these areas.

The follow table, Table 13, serves to illustrate some of the findings during the drive through of the construction area of the housing developments of which the drawings plans were reviewed for this audit.

Table 13: Overview of the findings from the Universal Access Audit that was conducted in Ocean View (Author's construct, 2015).

Images from onsite audit	Comments and observations
 <p>Onsite Image 22: Children playing in the road, as no provision has been made for them to play in safer areas</p>	<p>As with the other developments that have been reviewed, home owners and residents in this development started to move into the houses as soon as they had been completed, which meant that families were surrounded by building rubble from the nearby construction sites.</p> <p>Numerous groups of children were playing in the access roads, because no provision had been made for safe playing areas for the children.</p>



Onsite Image 23: Stepped access into the houses is of varying heights. In some cases, the stepped access is the required tread height of one tread, viz. 170mm, whilst in other cases the treads are higher than 250mm, and in other cases as many as four steps are needed to access the house.

The entrances to the houses vary, as the finished floor level changes drastically in gradient throughout the development. It appears that the change in gradient is not solely due to the geographical area where the development is located but also due to the uneven foundations of the houses, which be a result of poor ground preparation prior to the commencement of construction.

In some cases, the front door access has one 170mm high step; in other cases, such as in Image 23, four steps lead into the house. Again, this makes access to the houses very difficult for children and the elderly and for people carrying goods through the entrance.



Onsite Image 24: The orientation of the houses creates hiding spaces and passages between them, where residents are not able to see clearly. This does not ensure a safe and secure environment.

The orientation of the houses also varies; the sole reason appears to be the space allocation within the development, and the predetermining of the road surface areas, prior to the consideration of North facing houses. This indicates that the developers were not sensitive to the orientation of the houses to maximise the benefit of the natural elements, such as the wind, sun and rain.

Having narrow alleys between houses, with the entrances located in various positions, also increases the likelihood of crime. The houses should be orientated to increase security and clear lines of sight, rather than creating dark hiding places between the houses.



Onsite Image 25: The riser at the door was in excess of 250mm, and the residents thus made their own modifications to the step to enable easier access to their house, using locally available materials.

In some cases, homeowners have had to make their own modifications, as best they can, to overcome the difficulties caused by the stepped entrances. Some residents have used stones from the surrounding area to extend the stepped access to the houses, to make it easier to enter the houses, as seen in this image.

SANS 10400 Part S of 2011 requires that stepped access to a house should not be more than 170mm per tread. In some cases at this development the tread well exceeded the requirements.



Onsite Image 26: Example of what residents have put in place to overcome the lack of pedestrian access to their houses. Residents also erected washing lines, in the absence of sufficient servicing facilities in the area to meet their needs.

Without the extended step at the entrance, the lock on the door is too high to be easily reached by the home owners, which is another reason for extending the step outside the entrance.

External greening is the responsibility of the owners, as is the maintenance thereof; in this case, though, the walkways between the houses are extremely steep and due to the dust and loose stones, potentially dangerous as a slipping or tripping hazards. It appears that no consideration was given to the areas between or around the houses and that people have been given possession of these houses without adequate pedestrian access being ensured.

As seen in Onsite Image 26, residents have already constructed their own washing lines because no provision was made for such services in the development. Installations such as this could prompt the additional construction of informal dwellings, which would reduce the appeal of the area and could adversely affect the intended architectural design.

Of the low-cost housing developments that were reviewed as part of this research, this is the most recently constructed; but it is unclear when the development was tendered for or which legislation or policies are therefore applicable. In terms of community design, this development is lacking what was correctly executed in the previously reviewed development in Flamingo Vlei. However, the Ocean View development does have aesthetically better looking houses, and the internal space allocation is bigger, which better suits the family sizes that typically occupy such low-cost houses. Despite these positive aspects, more consideration should have been given to the needs of the community and the residents during the initial design phases of the project because, as the development is nearing completion, it is becoming apparent to the developers/designers (who are only now, for the first time seeing children playing in the street and washing lines hanging across streets) that there are no safe areas for children, no common areas to do washing or hang clothes, dark areas amongst the houses, which could promote crime, and limited access to transport. The location of the houses in close proximity to each other is beneficial though, as it reduces unnecessary land sprawl: “Densities need to be increased so that urban compaction can be promoted, optimal use can be made of land and more viable urban settlements can be

created” (Smit, 2006: 9). Lastly, community involvement is essential in developing and nurturing ownership in low-cost housing programmes.

The findings of these reviews will be used to draft a list of recommendations for the improved design and development of low-cost housing programmes, specifically with making them more inclusive communities. These recommendations are based on the research that was conducted on houses developed over the past decade, from 2004 to 2014.

4.5 Three Tier List of Recommendations

It emerged from the interviews with the professionals in the fields of UD, architecture and low-cost housing, and from all the projects reviewed, that there are budgetary constraints to what could be achieved in the design and development of low-cost housing. As mentioned previously, this research only considered the basic costing of housing and did not investigate the full cost of housing; if practical solutions to the socio-technical needs of people living in low-cost houses are investigated, it is essential that all the related costs be considered in order for the findings to be at all relevant and to have a positive impact on future designs and developments of low-cost housing programmes. It is for this reason that the recommendations below are listed in three tiers, according to the area of application.

The list of recommendations below emerged from the findings during the course of the research; it has been developed from the international best practice findings, from local universal access audits and from the interviews with professionals. All of the recommendations were then categorised according to the area in which they are most applicable, which are categorised according to the context of the home, the immediate precinct or the surrounding community.

These three contexts are defined and described as follows:

Home: These are things that could be done to the homes/houses to achieve the optimum results with regard to community development and universal access, and in order to meet the socio-technical needs of the owners or residents.

Precinct: These are things that could be done within the precinct (viz. a collection of a few houses), to achieve the optimum results with regard to community development and universal access and with regard to meeting the socio-technical needs of the people within the immediate area. There is often an overlap between what can be achieved in the immediate precinct and in the larger community.

Community: These are the things that could be done within the community to achieve the optimum results with regard to development and universal access and with

regard to meeting the socio-technical needs of the low-cost housing community development as a whole.

Figure 4.22 below illustrates the findings and recommendations that have been categorised according to these three contexts.

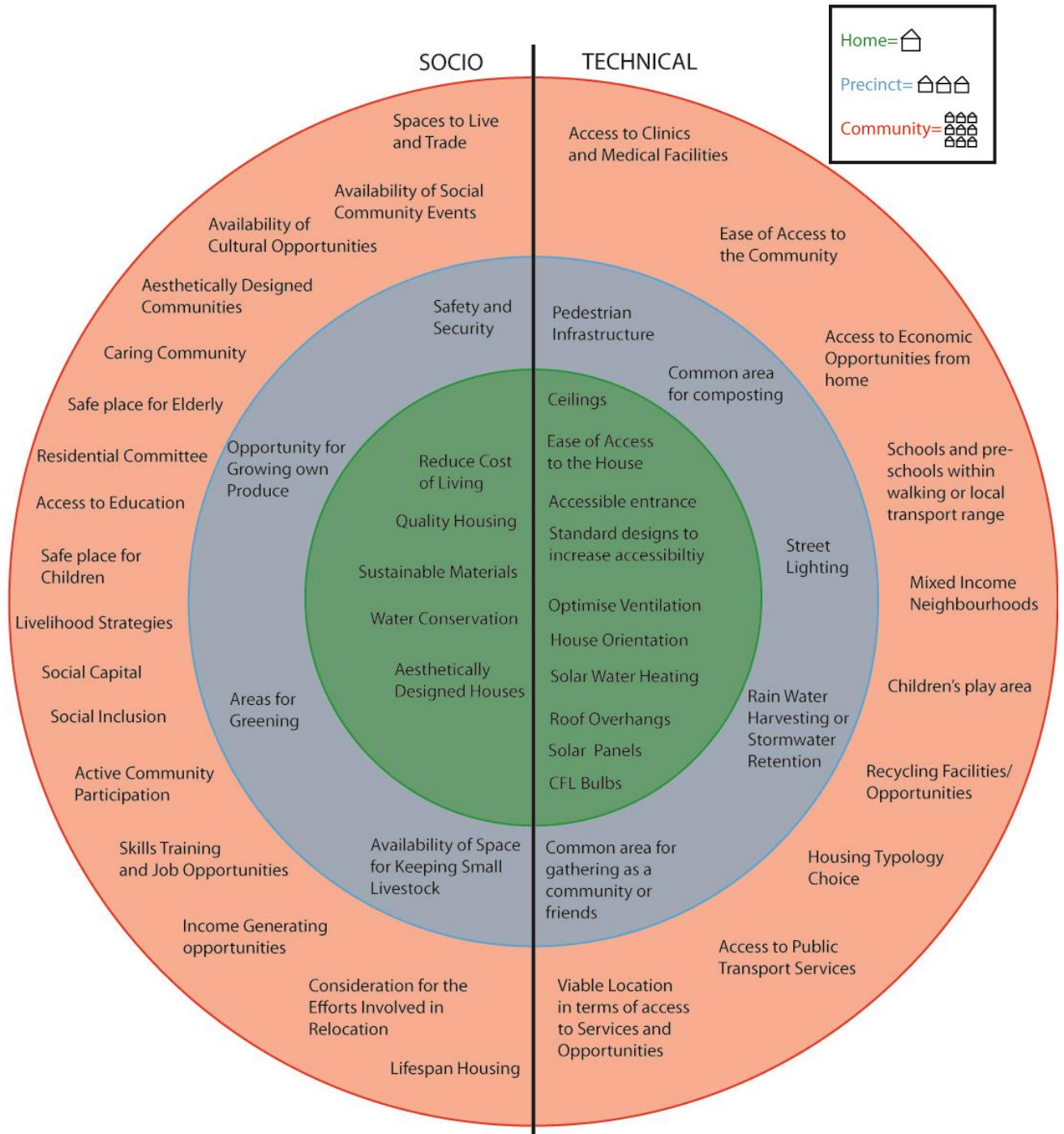


Figure 4.22: Categorisation of findings into context-specific areas of application (Author's Construct, 2015).

The three-tier list of recommendations, in alphabetical order, as categorised into areas of application are summarised in Table 14 below.

Table 14: Tabulated results for the three-tier list of recommendations for meeting the socio-technical needs of people living in low-cost housing. Each tier is categorised according to the applicable context: home, precinct or community (Author's construct, 2015).

Tier One: Socio-Technical Needs (Home)	Tier Two: Socio-Technical Needs (Precinct)	Tier Three: Socio-Technical Needs (Community)
Accessible entrance Aesthetically designed houses Ceilings CFL bulbs Ease of access to the house House orientation Housing typology choice Level entrance Lifespan housing Optimised natural ventilation Quality housing Reduced cost of living Roof overhangs Safety and security Solar panels Solar water heating Standard design to increase accessibility Sustainable materials Water conservation	Area to meet and greet neighbours Areas for greening Availability of space for keeping small livestock Common area for composting Common area for gathering as a community or friends Opportunity for growing own produce Pedestrian infrastructure Rain water harvesting or storm water retention Safety and security Street lighting	Access to clinics and medical facilities Access to economic opportunities from home Access to education Access to public transport services Aesthetically designed communities Availability of cultural opportunities Availability of social community events Caring community Children's play area Consideration for the efforts involved in relocation Ease of access to the community Income generation Lifespan housing Livelihood strategies Mixed income neighbourhoods Recycling facilities/opportunities Residential committee Safe place for children Safe place for the elderly Schools and preschools within walking or local transport range Skills training and job opportunities Social capital Social inclusion Spaces to live and trade Viable location in term of access to services and opportunities

The following sections describe the various recommendations according to the three tiers, and define the link between the social and technical needs that have been identified and categorised. Self-mobilisation is the ultimate in PD, and active participation (see Table 6, Chapter 3) is essential in achieving any of the recommendations as listed above. Consequently, the process of participation is not listed as a recommendation in itself; rather, it is a prerequisite for low-cost housing and should be clearly stipulated in the tender

requirements, along with the expected level of participation, which in the case of low-cost housing developments, should be a completely bottom-up approach.

Access to running water, sewage removal facilities, electricity provision, etc., are elementary and essential, and therefore not listed specifically in the recommendations. As these facilities and services are essential to all these developments, they should form part of the tender requirements from the outset. With that said, the interviews with the professionals also indicated that the monitoring and evaluation of the execution of the work stipulated in tenders is just as important as the specifications therein, and therefore more stringent monitoring and evaluation processes need to be put in place from the Cities executing these types of works, to ensure all-round compliance.

4.5.1 Tier One: Socio-Technical Needs in the Home

The following areas have been identified, where UD should be incorporated into houses in order for low-cost housing developments to meet the emerging socio-technical needs of people with diverse needs:

In light of the initial findings and the specific requirements contained in the recent tender document, as well as the new methods of construction that were briefly introduced, it is clear that tender documents must be very specific about the methods of construction and the quality of such construction, in order to ensure that *quality housing* is provided. Given budgetary limitations and the need to keep expenses as low as possible, it is recommended that *sustainable materials* be used, to the best of the contractor's ability and according to the availability of the materials within the areas where the housing developments are being constructed. Again, this should be explicitly stipulated in the tender requirements that are to be met by the contractor and should have monitoring and evaluation criteria that are followed up on by the City. The location of windows and doors within the design of the houses should seek to *optimise natural ventilation*, as this also plays a role in *reducing living costs* as well as having additional benefits for the health and wellbeing of residents. Similarly, *orientating houses* to maximise the use of the sun and wind (solar power and wind power and North facing where possible) could benefit home owners, specifically when solar equipment is installed, namely *solar panels* and *solar water heating*. These too will *reduce living costs* and increase the sustainability of the housing development, by providing the home owners with services that are not dependent on the electricity grid, which is currently under severe strain. Although solar geysers are currently being installed as part of most tender requirements, as are pre-paid electricity meters, it is recommended that even more sustainable processes be introduced as a new building standard, as this would enable residents to reduce their

dependence on governing authorities to provide services and *reduce their living costs* at the same time.

A social requirement is that the home should be *aesthetically designed*; this can be ensured by offering people a choice of different *housing typology designs*, as they are more likely to take ownership thereof if they have had a chance to give input on what their house should look like according to their individual preferences. There are examples of housing developments, where no aesthetics have been considered in the design of the houses, which has had a negative impact on the ability and willingness of people to maintain and look after their homes. The community in Ocean View, for instance, has houses that are considered aesthetically pleasing; however, due to the cost of the stones used for the facade, the houses that have been constructed last have less of an impressive facade than the houses that were constructed initially, due to poor budgeting and planning (possibly not including sufficient quantities to consider loss/wastage/theft of building supplies), which indicates that planning for aesthetics is essential. There is no need for low-cost housing to be of the traditional 'cookie cutter' variety, where all the houses look exactly the same, all with the same orientation and all finished in the same manner. Instead, it is much more preferable for the houses to have slightly different designs and for various housing types to catering for mixed income neighbourhoods, which would all contribute to the overall *aesthetics of the houses*.

Houses also need to be designed in a manner that encourages *safety and security*; this could be achieved through the location and orientation of the houses in relation to the surrounding houses and the surrounding infrastructure. As can be seen at Ocean View, the orientation of the houses created hiding spaces, where there was a lack of lighting, which encourages crime within the community. More attention needs to be paid to designing such housing developments to create a neighbourly environment with sufficient levels of lighting.

The possibility of *reducing living costs* is dependent on the fulfilment of specific technical requirements from the builder/contractor as well as attitudinal conditioning of the residents through PD. This means that specific technical requirements needs to be stipulated (such as solar panels, water saving, etc) for inclusion and execution by the architects/designers and constructors as well as there being a need for the residents to understand the reasoning for the use of these interventions and the benefits that it offers them. In other words, in the social sense, it is based on awareness that there are methods of cost saving, once residents have access to running water and electricity. This can be achieved through disseminating information concerning *water conservation* and saving electricity, which could then be followed up on by the *residential committee*. On the technical requirements list, *ceilings, roof*

overhangs and *CFL light bulbs* all contribute to *reduced costs of living*. Again, these seem to be basic features and obvious solutions, but these requirements were not often seen to be implemented during the onsite housing audits, and should therefore explicitly be required as part of the tender fulfilment, as the incorporation of these elements could ease the lives of home owners and reduce their living costs.

In terms of physical access to the houses, as previously discussed, sufficiently wide entrance doors are able to accommodate all people, including those in wheelchairs; it also assists in the development of *lifespan housing*. For an *accessible entrance*, the clear opening width of the entrance should thus be no less than 750mm. As these houses are generally constructed on raised foundations, homeowners should be able to choose whether they would like steps or a ramp: if there are steps, each riser should be no higher than 170mm; alternatively, a ramp should lead up to the front door where a *level entrance* cannot be achieved. Through such interventions, entrances to the low-cost houses would meet the SANS 10400 Part S requirements for facilities for people with disabilities as well as increase the *ease of access to the houses* for all people. In addition to the entrance configuration, a *standard design to increase accessibility* could be employed for the bathroom areas, which again could meet the requirements in SANS 10400 Part S. Increasing the bathroom size to 1.8 meters by 1.8 meters, and using the toilet and basin configurations as stipulated in SANS 10400 Part: S (2011), would allow sufficient space for the installation of a shower in the bathrooms. Although bathing is generally preferred, especially for children, this could be overcome by installing a lowered tap point within the shower, which would increase the ease with which larger water basins are filled for the use of children and the elderly, if so required.

4.5.2 Tier Two: Socio-Technical Needs in the immediate Precinct

The following areas have been identified, where UD should be incorporated into the immediate precinct in order for low-cost housing developments to meet the emerging socio-technical needs of people with diverse needs:

Often taken for granted in established communities and living areas are *areas for greening*. In order to grow a community's sense of responsibility and to establish a feeling of homeliness, *areas for greening* should be part of the design and planning phase of precincts, and the location thereof should be part of *active community participation*. This social requirement is part of the needs identified for the precinct, as there are more *areas for greening* required than there are for schools, preschools or play areas, all of which are part of the larger community. *Areas for greening* are also considered to be a "quick win" in terms of creating a more user-friendly and inviting housing area.

Along with *areas for greening*, areas that facilitate the *opportunity for growing produce* would contribute to the development of micro-businesses and reduce the cost of living for some families. Whilst this is the responsibility of the community or of individuals to take advantage of the opportunity, the housing development should be designed to facilitate these opportunities. Directly related to the social requirement for the *opportunity for growing produce* is the technical requirement of providing a *common composting area*. Again, allowance for this requirement needs to be made in the planning and layout, and it would be the responsibility of the community to manage such facilities; however, the facilitation of the *common composting area* could present opportunities for income generation and micro-business development.

Within precincts, there should be spaces that are dedicated to *common areas for community gatherings* and *areas to meet and greet neighbours*. In order to create a cohesive community, residents of low-cost houses need common areas to meet and discuss happenings in the community and to give or receive feedback on various developments. By facilitating these gatherings by putting in place technical interventions (i.e. creating an amphitheatre or community hall, for instance, the community has the opportunity to grow as a supportive community.

Along with the requirements relating to reduced costs of living and the use of sustainable materials from tier one (Section 4.5.1), *rainwater harvesting or stormwater retention* are a progressive step towards a more sustainable community. Linking to the creation of *opportunities to grow produce* and *water conservation*, the use of rainwater or stormwater is a beneficial intervention.

In areas where resources, such as larger supermarkets and retailers, are too far away, residents often use the opportunity to provide the basic requirements to establish micro-businesses in selling small livestock and poultry from their homes. As seen during the onsite visits, the small livestock roam the surrounding environment freely in search of food. As indicated in the development in Netreg, where keeping horses was a micro-business, houses located on the outskirts of the housing development are prime properties for the set-up of small holdings to make *available space for keeping livestock*. The development of the housing communities, through active community participation, should be designed to incorporate these facilities, and houses should then be assigned to persons who have an interest in these types of micro-businesses.

Indicated as a basic need in Maslow's Hierarchy of Needs, and a large concern for people living in low-cost housing developments, are *safety and security*. It has been clearly

demonstrated that the strength of community awareness and vigilance works effectively and easily with a well-coordinated residents committee, as shown in the Flamingo Vlei housing development. *Safety and security*, though a social requirement, are also part of the technical requirements, as a well-designed and well-considered layout of the precinct can discourage petty crimes. Similarly, *street lighting* and *pedestrian infrastructure*, which seems to be basic requirements, could increase the safety of an area, as they make the precinct more visible and more easily accessible. Again, *street lighting* and *pedestrian infrastructure*, which are technical requirements, generally do not form part of the tender requirements but they should be incorporated in the design of housing developments, so that they can be provided by the relevant government department or so that measures can be put in place for the construction or installation thereof.

4.5.3 Tier Three: Socio-Technical Needs in the surrounding Community

The following areas have been identified, where UD should be incorporated into the surrounding community in order for low-cost housing developments to meet the emerging socio-technical needs of people with diverse needs:

In order to assist in the creation of a more *caring community* and one that is *safe for the elderly and children*, the design phase of the housing project needs to include the active participation of community members to encourage them taking ownership and becoming involved in the development. This requirement is not an outcome but rather a process that needs to be implemented throughout the design and planning phases of the housing development. By giving residents a choice of housing typology and allowing for *mixed income neighbourhoods* through active community participation, a greater sense of ownership of the development is created, and it expands the opportunity for micro-businesses to grow. A final result of such active community participation must be the appointment of a *residential committee* that would act as a body corporate for the development. By creating a *residential committee*, owners are able to take control of the security measures that need to be put in place; the community can hold the committee responsible for the execution of various community tasks and events, and for the creation and/or installation of features that the community would like to see in their area. The formation of the *residential committee* is not an organic result of active participation in the design phase, but must be integrated into the tender requirements, in order to enable the community to better take care of itself, independently of the organisations who design and construct the housing development. The *residential committee* requires training in communication, leadership and basic business skills, which must therefore also form part of the tender requirements that need to be met in order to create a more cohesive community.

As part of the initial studies and research into the area prior to the commencement of design and planning for the housing development, studies looking at *livelihood strategies* should be conducted by the governing authority and should be presented as part of the tender for use in planning by the contractor. This will allow the design team insight into what is required within the community to support micro-business development and design for *social inclusion*, even before the community participates actively in the design and planning phases. The findings from the *livelihood strategies* studies could then be further driven by the *residential committee* to secure fulfilment of the requirements for the creation of an inclusive society that presents opportunities for economic development. The *livelihood strategies* and the training required for the *residential committee*, in conjunction with the existing model of using and training local people for construction and building, and the requirement of *skills training and job opportunities* could all be met in a more holistic and sustainable manner, that is driven by the community. This will then result in meeting the technical requirement of *access to economic opportunities from home* for residents from the community.

The *consideration of the efforts involved with relocation* is a requirement that is not the responsibility of the developers or the designers, and there is nothing that the chosen community area can do about meeting this requirement. This is the responsibility of the governing authority of the province, when the location for the new development is chosen along with the people who are allocated to live in that development. Chosen areas for development should be inhabited by people from the surrounding community who have followed the correct procedures in order to be on the waiting lists. This process needs to be transparent and well communicated at the start of the development and throughout the whole development phase to prevent further distrust. Similarly, relocation of the housing developments a long distance away from the city inherently increases the travel costs to the CBD for work. In order to limit or even reduce the cost of travelling, housing developments need to minimise the relocation distances and plan for *access to public transport services*.

The requirement for *lifespan housing* is as much the result as it is the process. Through active participation, *livelihood strategies*, *social inclusion* and the creation of the *residential committee*, the housing development is able to consider all aspects that are needed to fulfil the design requirements for *lifespan housing*. In meeting the social requirement for *lifespan housing*, the technical requirement of *access to clinics and medical facilities* are met too, as this would meet the needs of the elderly, children and people with disabilities from the community.

Access to education is a social need that is met by the technical requirement of having *schools and preschools within walking distance or within local transport service range*. The

location of schools and preschools is part of the active community participation phase, which must be planned for during the initial design phase. As seen in the tender requirements, it is usually only the construction of houses that is required from the contractor. However, this research has clearly indicated the importance of designing and creating a community, and access to schooling is one element that would contribute to uplifting people in low-cost housing developments. The same applies to the creation of *children's play areas*, as the space needs to be designed into the planning of the housing development community to allow for the development of the spaces, which should perhaps be managed by the *residential committee*. Housing tenders should therefore allow for joint ventures, where the planning and incorporation of schools, preschools and play areas, per fixed number of housing units, are integrated into the design and development; other government departments could then put in place the necessary interventions to meet these socio-technical requirements of a developing community.

Through creating areas where there are *spaces to live and trade* and through facilitating *income generating* opportunities and micro-businesses, which are further enhanced by the use of *mixed neighbourhoods*, the community will be better able to sustain itself. These are all part of the functions of the housing development and should be defined through active community participation in the initial phases of design and layout. Findings have indicated that some houses (generally the ones located on the edge of a few houses) should be designed for conversion into a micro-business that operates from the home.

Social capital is more the result of various processes than an independent requirement; however, the contractor should understand that the aim of low-cost housing is to provide a home to a new community and that it should therefore facilitate *social capital*.

Ease of access to the community – in other words, the use of housing numbers and street names to create clear addresses – moreover facilitates emergency access to the housing development. It also facilitates the rate and efficiency with which services are delivered to the area by the various municipal departments.

Along with sustainable materials and reduced cost of living initiatives within a low-cost housing development, other common features within the community could further assist these requirements. One such feature is the location of a communal *recycling facility*, as this not only reduces waste that must be sent to the landfill sites, but it also creates *income generation opportunities* within the community. Recycling, which is a fairly new initiative, has not previously been seen in these neighbourhoods, but it should be promoted to new home

owners, along with the benefits that it could offer to the community; this should be further driven by the *residential committee*.

The technical requirement of a *viable location in terms of access to services and opportunities* is not a requirement that could be met through design and layout, but is rather a requirement for the selection process of determining the location of the new housing development. This is the responsibility of the governing authority. It should therefore be considered when the area for development is chosen, and should also take into consideration *access to public transport* and the *efforts involved in relocation*.

Within the last tier of requirements for the application of UD to meet the socio-technical needs of people living in low-cost houses, a requirement that is specific to the community is the *availability of social community events*. Social events could be coordinated by ward councillors or people within the larger community, but could also be arranged by the smaller low-cost housing community if so desired. It is therefore required that consideration be given to the design and layout of the community to include within the large community, a space to facilitate *social community events*. A local common area for gathering as a community could be used to host larger *social and cultural community events*, but this would need to be considered during the initial design and layout phases through active community participation. Similarly with the *availability of cultural opportunities*, by providing space locally within the low-cost housing development itself, the surrounding larger community would also benefit from the services or the provision of facilities, which would contribute to uplifting larger communities.

The last socio-technical need that is part of the list of recommendations relates to *aesthetically designed communities*. Community design includes greening initiatives, pedestrian interfaces, safe and secure housing layout, areas for children and accessible spaces for the elderly and people with disabilities. Therefore the total design and layout of the housing development must form a cohesive living space to encourage ownership and to make residents feel proud, as well as to offer opportunities to uplift the entire community. This constitutes *aesthetically designed communities*.

4.6 Contextualisation of Recommendations

In order to contextualise the three-tier list of recommendations, the two examples from Chapter 4.2.3 Comparison and Discussion of Findings on Best Practices, which resulted in the highest total rating according to the specified review criteria (Monterrey, Mexico with a rating of 19 and Red Location, Port Elizabeth with a rating of 23, both out of 28) are marked against their performance according to the three-tier list of recommendations as listed in

Figure 4.22, which categorised the findings into the context specific areas of application. This serves to indicate the achievability of the list of recommendations, both on international and local low-cost housing developments.

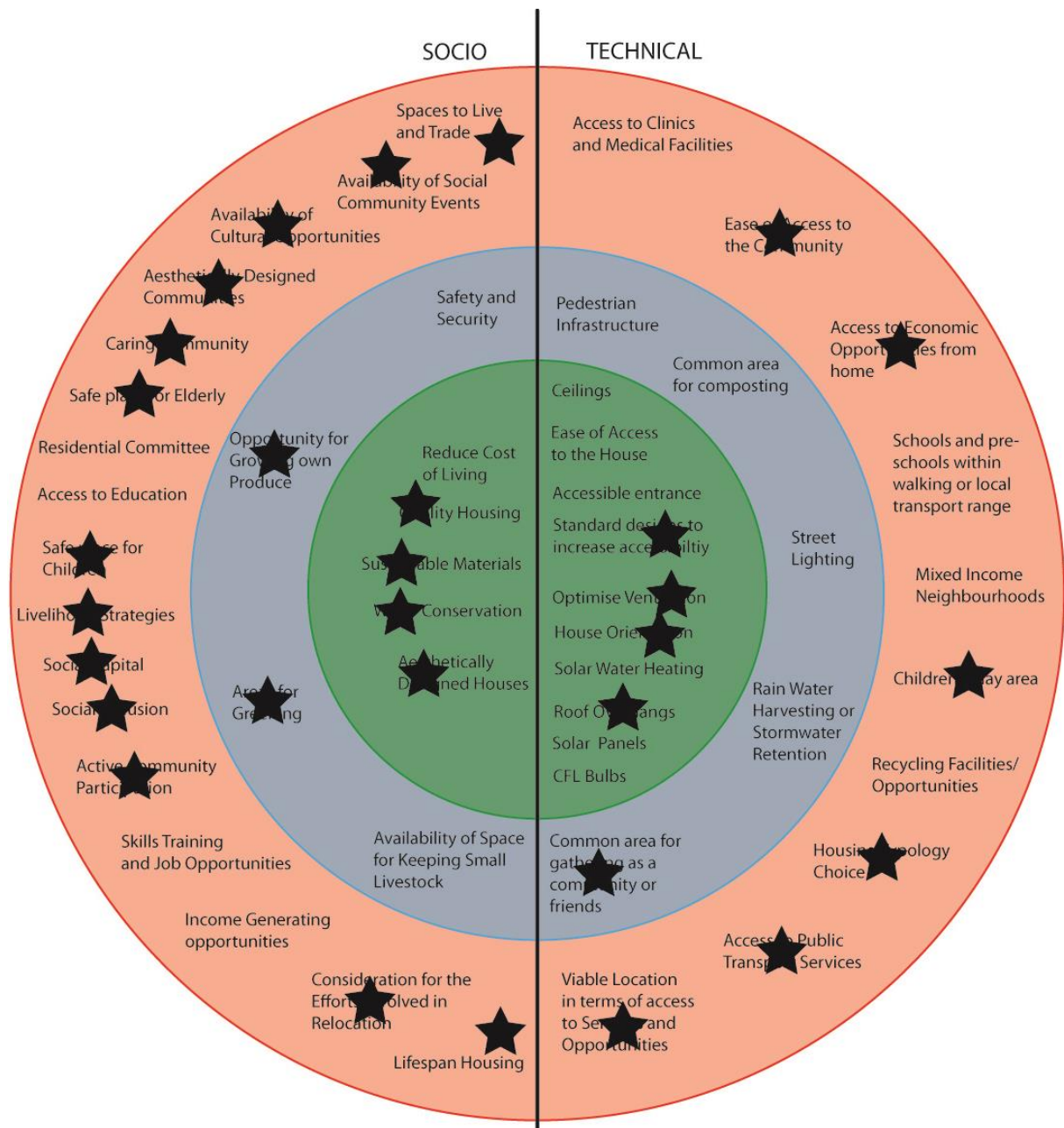


Figure 4.23: Rating of international best practice example, Monterrey Housing by Elemental in Monterrey, Mexico, according to the categorisation of findings based on context-specific areas of application (Author's Construct, 2016)

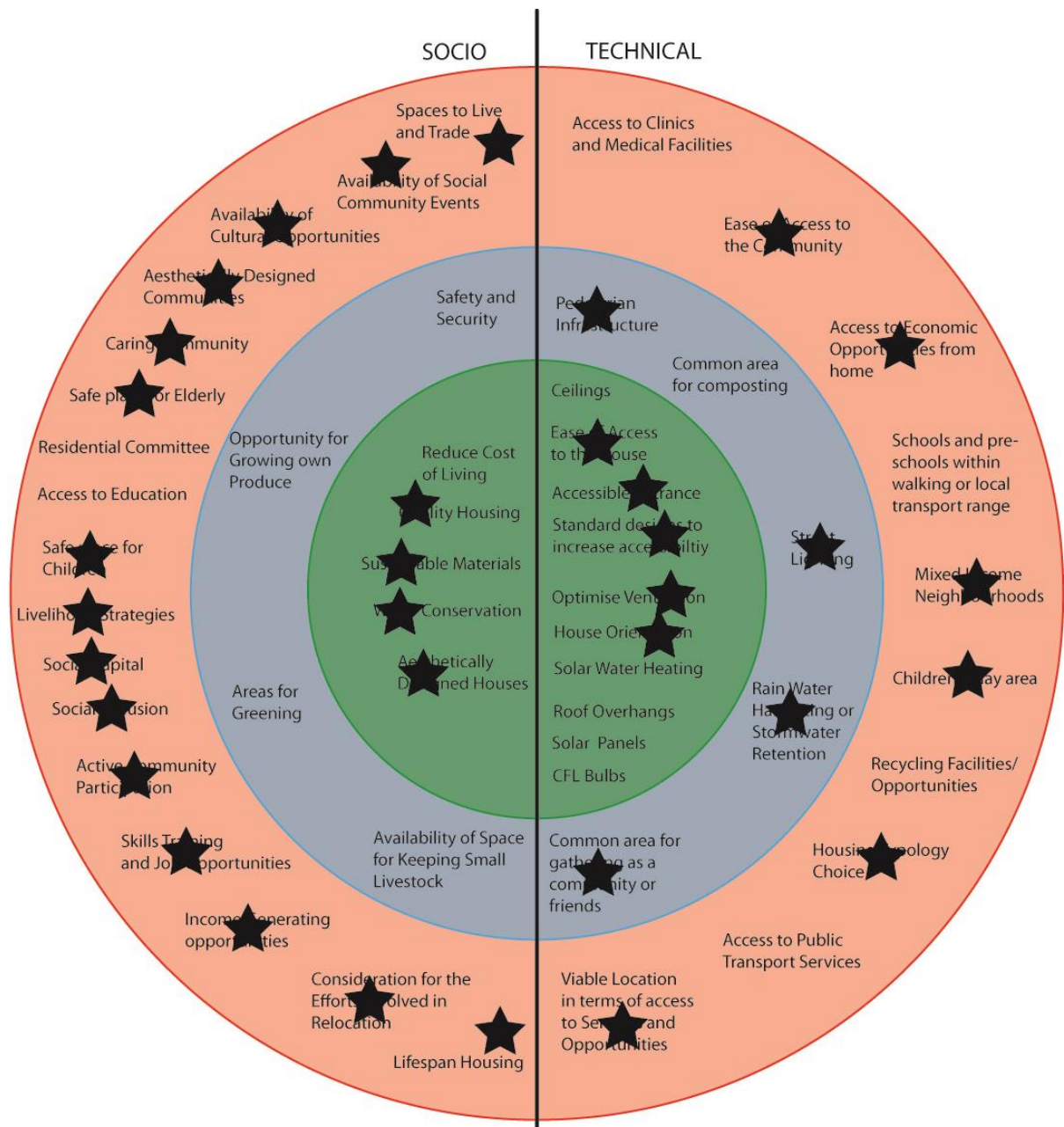


Figure 4.24: Rating of local best practice example, PELIP Housing by Noero Wolff Architects, Red Location, Port Elizabeth, South Africa, according to the categorisation of findings based on context-specific areas of application (Author's Construct, 2016)

The findings illustrated above, indicates the relationship between the best found examples in local and international practices regarding low-cost housing and the ability to implement the three-tier list of recommendations. The stars in Figure 4.23 and Figure 4.24 serve as pointers to areas of achievement where the existing housing development met the requirements as indicated in the recommendations, which resulted in a higher overall rating according to the findings in Chapter 4.2.3 Comparison and Discussion of Findings on Best Practices.

4.7 Summary

The overall findings from the international and local examples indicated that PD was, in most cases, an area where low-cost housing, even on an international level, performed the strongest. This indicates that, even when people from the communities, who were receiving the houses, were not always actively engaged during the process, they were in fact the main area of focus. Monterrey (Mexico) and Red Location (South Africa), which received the highest overall rating, also paid particular attention to sustainability in terms of ecological and economic sustainability, as well as UD, because the concept of lifespan housing informed the design and layout of the houses and the surrounding infrastructure. The local examples, on average, according to the rating criteria as seen in Table 9 in Section 4.2.3, received higher ratings for PD than the international examples which indicate the positive results that the incorporation of PD within tender requirements has on a project of this nature. This suggests that in order to increase the application of UD into the development of low-cost housing, the requirement therefore and then possibly resulting financial implications, should be incorporated into local tender requirements.

An important outcome of the review of the most recently available tender document for housing, is the finding that contractors or tender submitters generally only meet the specific requirements of what is being requested, which in most cases are the minimum requirements. Consequently, many houses are constructed in the shortest timeframes with the smallest budget. However, community participation is time consuming, and designing for lifespan housing access requires additional design and research from an architectural perspective. Given the tight time constraints with regard to housing developments, time is proportionately linked to cost; hence these vital processes are easily left off the list of the tender requirements for low-cost housing. The tender requirements do however indicate the standards that need to be adhered to when using construction materials, which should overcome poor construction of the houses. However, specifying standards of materials is different from specifying the quality of construction, as even the use of good quality materials could still lead to the poor construction of houses. Therefore tender requirements should be more specific about the quality of the constructed houses, and be stricter with regard to the type of PD that is engaged in as well as to include requirements for lifespan design, surrounding facilities and infrastructure and creating a space for sustainable interventions, such as recycling, small shops, greening and common areas.

The overall application of UD within the various professions that formed part of the research was poorer than expected. As the majority of people interviewed for the research were involved in low-cost housing, it could have been expected that the notion of UD would be more readily understood due to the level of advocacy of PD that the interviewees already

engaged in. However, this was not the case. Although there is a direct relation between PD and UD, the two are very different aspects within design, and can therefore be applied separately – although this is not recommended. The advocacy of PD is much stronger than that of UD, and therefore it is more readily applied and more commonplace than UD. As the professionals indicated, education and awareness round UD is pivotal in its application in all related fields.

Although the application of PD is visible in the 2013 housing development that formed part of the onsite audits (Flamingo Vlei), minor changes in the design and layout would have contributed to a more holistic design that would have accommodated a larger variety of people with diverse human needs. The onsite audits indicated an overall lack of consideration that contractors and constructors generally have for the people for whom they are actually constructing the houses. If both UD and PD principles had been applied, housing developments within Cape Town and South Africa in general, could have had a very different outcome. Regrettably, due to cost and time constraints, a more holistic design process, which would have resulted in the creation of communities and cohesive societies, would also have resulted in the construction of fewer houses. However, given that people have the right to live in adequate housing, a community with Ubuntu at its heart might facilitate the transcendence of people, and would thus be better than a mass of ‘cookie cutter’ houses, where people have little attachment to and ownership of their houses.

As the interviewees indicated, there is certainly a requirement for the application of UD in various spheres within low-cost housing developments. Moreover, the principles of UD should be included at all three levels within housing developments, viz. the home, the precinct and the community (Fransolet & Bolnick, 2014), as interventions should be applied across the board, when it comes to low-cost housing developments.

In summary, the findings, which resulted in the three tiers of recommendations discussed above, provide an overall understanding of what is required to meet socio-technical needs within the context of low-cost housing developments. These should all be applied through interactive PD, which uses and encourages self-mobilisation, and a complete bottom-up approach to change the existing system and processes. Although initially it was thought that the three-tier set of recommendations would be most effective, if categorised according to priority, however, the researcher believes, which is supported by Phillip Thompson (Fransolet & Thompson, 2013) who is one of the leading universal access consultants in South Africa, that UD should not be partly or haphazardly or selectively applied. If UD is a process that is being applied, as it aids in the enforcement of human rights, it should be applied completely and not in a piecemeal format. This is why the recommendations are provided per area of

application, and thus, in most cases, the needs or requirements stipulated as UD recommendations, overlap with another area of construction or sustainability or are related to PD. Hence the application of UD as per the recommendations covers even broader issues around low-cost housing, offering a more holistic approach to designing an inclusive and cohesive community.

CHAPTER FIVE

CONCLUSION

5.1 Introduction

Although South Africa is still living with the legacy of a previously segregating régime, the country has made extensive progress for such a young democracy, in terms of striving towards integration and inclusion. Nonetheless, the country still has many obstacles to overcome, although this is not unlike any other country across the world. South Africa and specifically its major urban centers were originally designed to separate and segregate people of the same nation. In order to create communities centered on people, rather than on political compliance and requirements, the people who make up these communities need to be placed at the heart of development in the country, and it is my contention in this thesis that low-cost housing is the starting point of that transition.

This research sought to gain an understanding of international and local practices that could be applicable to the South African context, as well as to establish why UD is not being applied by interviewing professionals in areas related to low-cost housing. These findings, in conjunction with onsite audits of existing low-cost housing developments themselves, led to the identification of the socio-technical needs of the residents of such developments. These needs were categorized into a three-tier system of design recommendations, which could be applied to three areas within the housing context, namely to the home, to the precinct and to the surrounding community. The aim of this approach is to accommodate all people, irrespective of differences, including ability, age, gender, language, culture or race, and to encourage a sense of community and social integration.

5.2 Conclusion

Having investigated the history of apartheid, which was designed to create divides within the country since the 1950s, as well as the new laws and policies enacted since the change to a democratic nation in 1994, and having conducted an overview of the current low-cost housing situations in Cape Town, the findings reveal that the progress that has been made to date in terms of developing more cohesive communities is, interestingly, not dependent on laws, policies or regulations.

South Africa has a very basic set of building regulations that pertain to access to facilities for persons with disabilities, yet, as evident from the research, these regulations are very seldom applied to the actual design of facilities. Therefore, although SANS 10400 Part S (2011)

needs to be reviewed and updated, in order to inform people about the requirements for facilities to accommodate people with diverse human needs, updating these standards does not necessarily mean that they will be more readily adopted. A paradigm shift is required. It is my contention that understanding the principles of UD will create such a paradigm shift towards designing inclusive environments, services and facilities, although this is not easily defined in political papers, laws, policies or legislations that must then be enforced. Similarly, understanding the reasoning for the application of participatory design cannot be defined in the regulations as a requirement: people working in the field have a tacit understanding that such processes are essential to delivering houses (for example) that meet the needs of the community. What could be identified in regulations, however, is that participatory design should inform the design process from the outset, and that self-mobilisation and an active type of engagement should be used throughout all the stages. In the same light, UD needs to be inherently understood before it can become a requirement, in the same way that participatory design is currently specified in the tender requirements. Therefore, before UD is stipulated in more regulations and policies, it needs to be taught and awareness around it needs to be created to inform the masses of its benefits; once that is achieved, more mandatory requirements can be made.

The methodology and research design used in this research resulted in meeting the following objectives:

- To gain an understanding of what is being done in the low-cost housing sector on a global scale, and which implementations could be applicable in the South African context.
- To identify the main reasons for the lack of the implementation of UD from professionals within the system of design of low-cost housing in South Africa.
- To investigate the needs of people who live in the low-cost housing sector, from both the social and the technical aspects.
- To propose a three-tier system of design recommendations that is in line with the concepts of UD and participatory design that would be applicable to low-cost housing within Cape Town and to other settlement areas in South Africa.

Collectively, these resulted in the identification of socio-technical issues that could be addressed through the application of UD within the context of low-cost housing in Cape Town, South Africa.

On a global scale, the findings from Chapter 4 illustrated that, locally in South Africa, there are examples of low-cost housing that are comparable to what is expected from an international level in social housing. In order to review all of the examples objectively, a tool

to review the housing developments had to be designed. This tool served to map, graphically, the findings of the examples, viz. four international and four local, on the same rating system. Four categories were rated, viz. UD, construction, participatory design and sustainability. Although these categories alone are not what defines a good example of low-cost housing, these categories were identified as essential in terms of creating a more holistic approach to the application of UD in low-cost housing. The findings indicated that, while the international examples of low-cost housing were aesthetically more appealing, the local examples had a strong focus on participatory design and community engagement. The rating of the examples indicated that lifespan housing and designing to accommodate people with disabilities was not often considered in the design of low-cost housing developments, even though the reasonably high rating in participatory design indicated that it was often used as a tool for engagement. It has been determined that there is a direct relation between UD and participatory design, yet the engagement through a participatory approach does not guarantee that UD will be applied. This could perhaps be explained by investigating the types of participants in the participatory design process. It could be assumed that the engagement meetings and opportunities were most likely held in the affected community, and as these are generally inaccessible, people who are generally the minority within a community, such as parents with small children, the elderly and people with disabilities, were most likely not fully represented during the participatory process. This might explain, in part, the disparity between participatory design and UD. Therefore, a paradigm shift with regard to UD is essential for people from the community as well as for the contractors engaging with the community. Once it is understood that UD can improve the lives of all people, it is my contention that it can be more easily integrated into all areas of design. However, as that then depends on willingness of the contractors and developers to gain this understanding, there needs to be sufficient, legal, means of ensuring its adoption.

The review of a recent tender proposal indicates that the quality of construction of low-cost houses has been better defined in recent years, but it still requires a more definitive description of the constructed houses. This criterion also formed part of the rating tool. The ever-increasing number of people on the national housing backlog list also informed the rating system, being reflected by the number of houses constructed as part of a development. The rating tool also illustrated the importance of sustainability within a community, which is essential in terms of both economic and ecological aspects and opportunities. The features that were identified as being positive design elements from the review of the international and local examples informed the start of the list of recommendations for future application in low-cost housing developments.

The majority of professionals from the industry associated with low-cost housing developments indicated that they were not familiar with UD but were largely advocates of participatory design. Again, when looking at the explanation given above with regard to the possible misalignment of participants in relation to the representatives of UD, the explanation seems even more feasible. Although the majority of professionals indicated that the lack of application of UD within their spheres of work was due to their own lack of familiarity with UD, they also indicated that there is a requirement for people to have a better understanding of its principles. This, again, comes back to the requirements for awareness raising and education around UD, specifically in fields relating to design and social issues.

The findings from the onsite audits on local housing developments within Cape Town (viz. constructed prior to 2004, post-2004 and in 2014), illustrated a lack of comprehensive community design. The contractors appeared to be only concerned with constructing houses and not with creating the surrounding and supporting infrastructure, such as greening, common areas for gathering, providing easy access to houses (for mothers with prams, etc.), implementing safe pedestrian circulation areas and parking, orientating houses away from main vehicular routes, etc. Collectively, these findings informed the refinement of the list of socio-technical issues that were identified as being limitations to designing a more socially inclusive, cohesive and accessible community. These aspects therefore concluded the list of recommendations for future low-cost housing developments.

The three-tier list of recommendations does not list self-mobilisation, as people participate by taking initiatives, independently of external institutions, to change systems. This bottom-up approach allows people to develop contacts with external institutions for resources and the technical advice they need, but they themselves retain control over how resources are used (see Table 6 in Chapter 3). Although UD cannot successfully be applied without extensive community engagement and participation, because participatory design is already seen as a stringent requirement in the tender proposal requests, there have been no recommendations made for UD in such tenders. The only recommendation that can be made around participatory design is the level at which people from the community are engaged with, which should therefore be at the self-mobilisation level. This, together with the recommendations within particular areas of development within low-cost housing, would enable them to overcome the socio-technical issues that have been identified in low-cost housing in Cape Town, South Africa.

5.3 Limitations of the Research

Due to the complexity and inter-relationships of the various issues associated with low-cost housing developments, as illustrated in Figure 1.4 in Chapter 1, and as this research only dealt with a few of the relevant aspects that relate to low-cost housing, the remaining areas identified have not been investigated, even though they all affect and are affected by the areas investigated in this research.

At the time of this research, access to professionals in the fields relating to low-cost housing was limited, because they were all on tight timelines associated with their work. Although a total of 8 professionals were interviewed as part of this research, three interviewees only gave verbal permission for their interviews to be used in this thesis. According to the ethical requirements, written consent forms were required, but these three interviewees did not return their forms in time for publication and therefore the research is published without their input.

At the time when onsite data was due to be collected, and a working group within an informal settlement was due to commence, a series of political uprisings and unrest occurred within the N2 Gateway area in Cape Town. The working group and all onsite work at the N2 Gateway project thus had to be cancelled, and data collection had to be collected at various other settlements across Cape Town. However, the data that was obtained from the other settlements (Macassar, Flamingo Vlei and Ocean View) provided a large scope to evaluate houses that were constructed in different years and allowed the comparison between construction and legislative requirements at the time. So although this was a limitation at first, it resulted in richer data and a better research result.

It was hoped that this research would be able to influence standards, but due to the lack of credible and reliable enforcement of the existing standards, albeit lacking in substantial content, any influence that this research could have had was dismissed. Therefore in terms of influence in this regard recommendations are made for future research, but it is hoped that this research will bring to light the need for education, information dissemination and an overall paradigm shift towards the inclusion of UD in all aspects of design, architecture and construction.

5.4 Recommendations for Future Research

As indicated throughout this research, education and raising awareness with regard to UD should be a priority for designers, planners, architects and social workers. UD needs to be taught as part of various tertiary education subjects, and due to its scope of application, may even need to be an independent subject of study; this could be an area of further research.

A very small section of this research focused on SANS 10400 Part S (2011), which are the only standards currently available in South Africa, for the implementation of design in the built environment for people with diverse human needs. An area of recommended research would be to review the standards in detail, as well as to compare them thoroughly with international practices, to enable this section of the National Building Regulations to be updated and upgraded.

Similarly, National Guidelines and Standards for Non-Motorised Transport need to be developed, which would inform pedestrian access and other forms of NMT and ensure that they are accessible, safe and user-friendly, and based on international best practices that are applicable to our South African context. This is of particular importance given the national uptake of Bus Rapid Transit (BRT) services.

As the findings of the research culminated in a list of recommendations, it is suggested that the list be translated into a working design schematic and plan. As this research was conducted without participation by a working group of people from low-cost housing developments, it is recommended that the findings be presented to groups of users for input and further development.

5.5 Summary

The Constitution of South Africa grants all people the right of “access to adequate housing”, and protects people against discrimination by stating that

“The state may not unfairly discriminate directly or indirectly against anyone on one or more grounds, including race, gender, sex, pregnancy, marital status, ethnic or social origin, colour, sexual orientation, age, disability, religion, conscience, belief, culture, language and birth”.

It also protects people against unsafe environments by stating that “everyone has the right to an environment that is not harmful to their health or well-being”, and it takes into account the protection of children with regard to housing, by stating that “every child has the right to basic shelter” (South Africa, 1996:7-39). Yet, the housing needs of many urban residents are an obligation that is still often unfulfilled.

The housing backlog and issues around poor construction and lack of consultation and integration cannot be overcome through the uniform approach that is currently being taken in the existing policies and regulations, as it is encouraging land sprawl and the construction of dwellings on the outskirts of cities, further restricting access to opportunities for the country’s poor.

To create integrated, cohesive and responsible communities, design needs to be informed by the people for whom housing developments and communities are being designed, from the very beginning of the design process, through active participation. The designs of low-cost housing developments need to respond to the socio-technical needs of the people in the community and not the other way around. Community design too must consider facilitating a range of economic opportunities, creating mixed living spaces, ensuring the provision of services and facilities to encourage use of spaces, and implementing sustainable development and living.

As important as housing types and their locations are skills development and training of new home owners and people from the community. Without the necessary skills to manage, develop and grow their community in a positive way, housing developments can become another, albeit slightly more structured, settlement that faces the same levels of crime, the same bad behaviours and the same lack of services as did the informal settlements before they were upgraded or developed. Cohesive, responsible and well-managed housing developments cannot be formed by any one party alone, but rather require all the role-players, local government, communities and aid organizations to work together to make a positive impact on the housing conditions of low-income families.

UD applied through PD is defined as designing, planning and constructing better, safer and healthier environments, facilities and services for people and the communities at large. There is a great need to facilitate change in the manner in which housing is conceived, designed and delivered in South Africa. It is my contention in this thesis that UD and active community participation are the key to this, and that the only way to start such a shift in paradigm is through education and awareness of UD and its benefits as a complete and holistic approach when used in conjunction with participatory design.

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APPENDIX A: Principles of Universal Design (source: Center for Universal Design, 2011)

The Principles of Universal Design

The design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design.

1 Equitable Use
The design is useful and marketable to people with diverse abilities.

2 Flexibility in Use
The design accommodates a wide range of individual preferences and abilities.

3 Simple and Intuitive Use
Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or education level.

4 Perceptible Information
The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.

6 Low Physical Effort
The design can be used efficiently and comfortably and with a minimum of fatigue.

5 Tolerance for Error
The design minimizes hazards and the adverse consequences of accidental or unintended actions.

7 Size and Space for Approach and Use
Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility.

APPENDIX B: The Universal Declaration of Human Right (United Nations. 2013).

PREAMBLE

Whereas recognition of the inherent dignity and of the equal and inalienable rights of all members of the human family is the foundation of freedom, justice and peace in the world,

Whereas disregard and contempt for human rights have resulted in barbarous acts which have outraged the conscience of mankind, and the advent of a world in which human beings shall enjoy freedom of speech and belief and freedom from fear and want has been proclaimed as the highest aspiration of the common people,

Whereas it is essential, if man is not to be compelled to have recourse, as a last resort, to rebellion against tyranny and oppression, that human rights should be protected by the rule of law,

Whereas it is essential to promote the development of friendly relations between nations,

Whereas the peoples of the United Nations have in the Charter reaffirmed their faith in fundamental human rights, in the dignity and worth of the human person and in the equal rights of men and women and have determined to promote social progress and better standards of life in larger freedom,

Whereas Member States have pledged themselves to achieve, in co-operation with the United Nations, the promotion of universal respect for and observance of human rights and fundamental freedoms,

Whereas a common understanding of these rights and freedoms is of the greatest importance for the full realization of this pledge,

Now, Therefore THE GENERAL ASSEMBLY proclaims THIS UNIVERSAL DECLARATION OF HUMAN RIGHTS as a common standard of achievement for all peoples and all nations, to the end that every individual and every organ of society, keeping this Declaration constantly in mind, shall strive by teaching and education to promote respect for these rights and freedoms and by progressive measures, national and international, to secure their universal and effective recognition and observance, both among the peoples of Member States themselves and among the peoples of territories under their jurisdiction.

Article 1: All human beings are born free and equal in dignity and rights. They are endowed with reason and conscience and should act towards one another in a spirit of brotherhood.

Article 2: Everyone is entitled to all the rights and freedoms set forth in this Declaration, without distinction of any kind, such as race, colour, sex, language, religion, political or other opinion, national or social origin, property, birth or other status. Furthermore, no distinction shall be made on the basis of the political, jurisdictional or international status of the country or territory to which a person belongs, whether it be independent, trust, non-self-governing or under any other limitation of sovereignty.

Article 3: Everyone has the right to life, liberty and security of person.

Article 4: No one shall be held in slavery or servitude; slavery and the slave trade shall be prohibited in all their forms.

Article 5: No one shall be subjected to torture or to cruel, inhuman or degrading treatment or punishment.

Article 6: Everyone has the right to recognition everywhere as a person before the law.

Article 7: All are equal before the law and are entitled without any discrimination to equal protection of the law. All are entitled to equal protection against any discrimination in violation of this Declaration and against any incitement to such discrimination.

- Article 8:** Everyone has the right to an effective remedy by the competent national tribunals for acts violating the fundamental rights granted him by the constitution or by law.
- Article 9:** No one shall be subjected to arbitrary arrest, detention or exile.
- Article 10:** Everyone is entitled in full equality to a fair and public hearing by an independent and impartial tribunal, in the determination of his rights and obligations and of any criminal charge against him.
- Article 11:** (1) Everyone charged with a penal offence has the right to be presumed innocent until proved guilty according to law in a public trial at which he has had all the guarantees necessary for his defence. (2) No one shall be held guilty of any penal offence on account of any act or omission which did not constitute a penal offence, under national or international law, at the time when it was committed. Nor shall a heavier penalty be imposed than the one that was applicable at the time the penal offence was committed.
- Article 12:** No one shall be subjected to arbitrary interference with his privacy, family, home or correspondence, nor to attacks upon his honour and reputation. Everyone has the right to the protection of the law against such interference or attacks.
- Article 13:** (1) Everyone has the right to freedom of movement and residence within the borders of each state. (2) Everyone has the right to leave any country, including his own, and to return to his country.
- Article 14:** (1) Everyone has the right to seek and to enjoy in other countries asylum from persecution. (2) This right may not be invoked in the case of prosecutions genuinely arising from non-political crimes or from acts contrary to the purposes and principles of the United Nations.
- Article 15:** (1) Everyone has the right to a nationality. (2) No one shall be arbitrarily deprived of his nationality nor denied the right to change his nationality.
- Article 16:** (1) Men and women of full age, without any limitation due to race, nationality or religion, have the right to marry and to found a family. They are entitled to equal rights as to marriage, during marriage and at its dissolution. (2) Marriage shall be entered into only with the free and full consent of the intending spouses. (3) The family is the natural and fundamental group unit of society and is entitled to protection by society and the State.
- Article 17:** (1) Everyone has the right to own property alone as well as in association with others. (2) No one shall be arbitrarily deprived of his property.
- Article 18:** Everyone has the right to freedom of thought, conscience and religion; this right includes freedom to change his religion or belief, and freedom, either alone or in community with others and in public or private, to manifest his religion or belief in teaching, practice, worship and observance.
- Article 19:** Everyone has the right to freedom of opinion and expression; this right includes freedom to hold opinions without interference and to seek, receive and impart information and ideas through any media and regardless of frontiers.
- Article 20:** (1) Everyone has the right to freedom of peaceful assembly and association. (2) No one may be compelled to belong to an association.
- Article 21:** (1) Everyone has the right to take part in the government of his country, directly or through freely chosen representatives. (2) Everyone has the right of equal access to public service in his country. (3) The will of the people shall be the basis of the authority of government; this will shall be expressed in periodic and genuine elections which shall be by universal and equal suffrage and shall be held by secret vote or by equivalent free voting procedures.
- Article 22:** Everyone, as a member of society, has the right to social security and is entitled to realization, through national effort and international co-operation and in accordance with the organization and resources of each State, of the economic, social and cultural rights indispensable for his dignity and the free development of his personality.
- Article 23:** (1) Everyone has the right to work, to free choice of employment, to just and favourable conditions of work and to protection against unemployment. (2) Everyone, without any discrimination, has the right to equal pay for equal work. (3) Everyone who works has the right to just and favourable remuneration ensuring for himself and his family an existence worthy of human dignity, and supplemented, if necessary, by other means of social protection. (4) Everyone has the right to form and to join trade unions for the protection of his interests.

- Article 24:** Everyone has the right to rest and leisure, including reasonable limitation of working hours and periodic holidays with pay.
- Article 25:** (1) Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services, and the right to security in the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood in circumstances beyond his control. (2) Motherhood and childhood are entitled to special care and assistance. All children, whether born in or out of wedlock, shall enjoy the same social protection.
- Article 26:** (1) Everyone has the right to education. Education shall be free, at least in the elementary and fundamental stages. Elementary education shall be compulsory. Technical and professional education shall be made generally available and higher education shall be equally accessible to all on the basis of merit. (2) Education shall be directed to the full development of the human personality and to the strengthening of respect for human rights and fundamental freedoms. It shall promote understanding, tolerance and friendship among all nations, racial or religious groups, and shall further the activities of the United Nations for the maintenance of peace. (3) Parents have a prior right to choose the kind of education that shall be given to their children.
- Article 27:** (1) Everyone has the right freely to participate in the cultural life of the community, to enjoy the arts and to share in scientific advancement and its benefits. (2) Everyone has the right to the protection of the moral and material interests resulting from any scientific, literary or artistic production of which he is the author.
- Article 28:** Everyone is entitled to a social and international order in which the rights and freedoms set forth in this Declaration can be fully realized.
- Article 29:** (1) Everyone has duties to the community in which alone the free and full development of his personality is possible. (2) In the exercise of his rights and freedoms, everyone shall be subject only to such limitations as are determined by law solely for the purpose of securing due recognition and respect for the rights and freedoms of others and of meeting the just requirements of morality, public order and the general welfare in a democratic society. (3) These rights and freedoms may in no case be exercised contrary to the purposes and principles of the United Nations.
- Article 30:** Nothing in this Declaration may be interpreted as implying for any State, group or person any right to engage in any activity or to perform any act aimed at the destruction of any of the rights and freedoms set forth herein.

APPENDIX C: Research Consent Form for Professional Interviews

Information Sheet

Name of Researcher: Colette Fransolet

Name of Organization: Cape Peninsula University of Technology

Name of Sponsor: This study is sponsored by the NRF

Name of Project: Universal Design for Low-Cost Housing in South Africa: An
Exploratory Study of Emerging Socio-Technical Issues.

Introduction

In fulfillment of the Masters Degree, Mtech Design, program at CPUT the researcher is investigating the application of universal design within the low-cost housing sector in Cape Town, South Africa.

Purpose of the research

This study aims to investigate the socio-technical issues that have arisen in low-cost housing in informal settlements in Cape Town, South Africa. As in other countries throughout the history of the world, certain population groups in South Africa have been excluded and segregated in many areas, of which one which is still extremely prevalent is the exclusion of marginalized groups within the low-cost housing sector.

Type of Research Intervention

Research information is gathered through interviews, which are semi-structured in nature to allow interviewees to express their own opinions. Interviews are generally based on a question and answer format which is audio-recorded by the researcher. Interviews are expected to take an estimated 45min per participant.

Participant Selection

It is essential to gather information from all levels of intervention within the housing scheme; this included areas of universal design, town planning, construction, architecture and academic areas. Some of the interviewees were also selected based on previous work in either the housing sector or an interest in housing or related community areas.

Voluntary Participation

All interviews are voluntary with no compensation for research input or information and if the participant, at any point during the interview or within four weeks after to the interview, is of the opinion that they would like to withdraw from the research, the researcher should be informed. At which point the data that was collected from the interview will be destroyed and all references in the study will be removed.

Risks

The researcher doesn't envisage any negative consequences for participants taking part in this research.

Benefits

There will be no direct benefit to participants, but participation is likely to help the researcher find out possible reasons to why universal design is not more widely practiced in South Africa and how it could be implemented on a more national level.

Confidentiality

Due to the interviews being with professional bodies that represent various sectors related to low-cost housing the researcher requests permission from the participant to add the participant as a reference within the research. Participants will, if so required, receive a digital copy of the completed research.

The recorded data and transcriptions thereof will remain in the possession of the researcher for a period of a year after final research submission, after which it will be irrevocably destroyed. No information gathered during the interviews will be shared with third parties.

The results from the interviews will be presented in the thesis. They will be seen by the researcher's two supervisors and two external examiners. The thesis may be read by future students on the course. The study or parts thereof may be published in a research journal.

Who to Contact

Approval has been granted by the Ethics board of CPUT for this study to take place. If participants require any further information, the researcher is contactable on the following details:

Colette Fransolet
072 027 3623
cfransol@yahoo.com

If participants agree to take part in the study, they are required to please sign the consent form overleaf.

Consent Form

I.....agree to participate in Colette Fransolet's research study.

The purpose and nature of the study has been explained to me verbally and in writing.

I am participating voluntarily.

I give permission for my interview with Colette Fransolet to be audio-recorded

I understand that I can withdraw from the study, without repercussions, at any time, whether before it starts or while I am participating.

I understand that I can withdraw permission to use the data within four weeks of the interview, in which case the material will be deleted.

I understand that extracts from my interview, with full references, may be quoted in the thesis and any subsequent publications if I give permission below:

(Please tick one box:)

I agree to quotation/publication of extracts from my interview

I do not agree to quotation/publication of extracts from my interview

Signed.....

Date.....

APPENDIX D: Structured Interview Guidelines

Are you familiar with the recently updated SANS 10400-S? How were you informed of the new standards?

What is your professional opinion of the updated SANS 10400-S?

In your opinion do you foresee the updated SANS 10400-S as being readily implemented in your sphere of work?

What strategies could be employed to ensure adoption of the SANS 10400-S standards?

Socio-economic: incentives or rebates?

Geo-political: Policies or enabling environments to be created

Operational: Clients interest or viability thereof

Are you aware of any other standards, policies or acts that are geared towards enhancing equity and social inclusion in the country? If yes, are you aware of any consequences for failure to comply with these? (Incentives or repercussions/ consequences)

Are you familiar with the concept of Universal Design/Access (UD/UA)?

To what extent do you apply UD/UA within your sphere of work and how?

Are you aware of universal design being promoted and implemented in other countries? If yes, name them and what factors would you attribute to the implementation thereof?

Are you aware of the application of universal design within the international social housing context?

Do you personally promote universal design in your field of work? If yes, how and how often?

What means of promoting UD locally can be implemented in your sphere of work?

Who should be the main actors with regard to implementing UD?

Which official/government policies would UD best align with?

Which national, regional or provincial and local government departments would best accommodate UD?

Who would be the best champions for UD in the context of the city of Cape Town?

Have you ever engaged in co-design activities with the people who are to occupy the buildings you design or construct? If yes, what was the response of the end-user who participated in these activities?

What feedback did you receive that could enhance future aspirations for co-design?

Would you say that UD is becoming a more common term of reference throughout Architecture? If no, please suggest what possible barriers exist to UD/UA's broader adoption?

What factors influence the decision to implement UD/UA in a project?

Are you an active member of any forum that promotes socially conscious design (e.g. Architecture for Humanity etc.)?

Any other comments

APPENDIX E: Copy of application form for listing of the City of Cape Town Housing Database. (City of Cape Town. 2014)

This form may not be sold or bought.
It is free from the City of Cape Town

Datestamp when received



APPLICATION FOR HOUSING ASSISTANCE / ACCOMMODATION FOR OFFICE USE ONLY

Date application form was received	Year		Month		Day	
Receiving Housing official's name						
Receiving housing office's name						
Registration number allocated on the database						
Existing application date (if any)	Year		Month		Day	

APPLICANT'S PERSONAL DETAILS *(please attach copy of identity book)*

Surname							
First names							
Identity number <i>(ID Number must be given)</i>							
Date of birth	Year		Month		Day		

SPOUSE OR PARTNER'S PERSONAL DETAILS *(i.e. wife/husband, not children) (please attach copy of id book)*

Surname							
First names							
Identity number <i>(ID Number must be given)</i>							
Date of birth	Year		Month		Day		

RESIDENTIAL DETAILS *(Address where you actually live)*

YOUR RESIDENTIAL ADDRESS	
Room/Flat number and name/block or Structure number	
Street number and street name	
Suburb	
Postal code	
1 st Cellphone number	2 nd Cellphone number
Landline telephone number	
If you are resident in an informal settlement what is the settlement's name	
How long have you lived in this settlement?	

MARITAL STATUS (Mark with a cross X)

Married in community of property					Divorced				
Married by antenuptial contract (out of community of property)					Separated, or partner deserted				
Customary marriage or Muslim marriage					Single				
Common law partner					Engaged to be married				
Date married					Date divorced/split				
Year		Month		Day	Year		Month		Day

DETAILS OF ANY DISABILITY IN THE FAMILY

Full details of any disability or medical condition in the family			
Category	Type of disability	Degree of disability	Tick X
A	Walking	Walking Aids (e.g. walking aids, walkers, crutches, walking stick)	
B	Walking	Wheel Chair - partial - Partial Usage	
C	Walking	Wheel Chair - full time usage	
D	Hearing	Partially / profound deaf	
E	Vision	Partial / Totally Blind	
F	Limited or no use of upper body limbs	Partial/Total movement loss/paralysis in upper limb	

INCOME DETAILS OF APPLICANT AND PARTNER (wife and husband)

	INCOME PER MONTH	INCOME PER WEEK
Applicant (gross wage/salary)	R	R
Partner (gross wage/salary)	R	R
Pensioner	R	R

TYPE OF GRANT AND AMOUNT

TYPE OF GRANT	AMOUNT PER MONTH
Maintenance	
Child/foster care	
War veteran	
Disability	
Any other regular monthly income	

DETAILS OF PRESENT LIVING ACCOMMODATION (Mark with a cross X)

In Main house/flat/hostel with the owner or tenant	Wood & iron shack
Outside room for renting	Wendy house
Other - please describe	Caravan/vehicle

DETAILS OF PROPERTY OWNERSHIP

Have you or your spouse/partner ever owned property before OR do you or your spouse/partner own property now?	Yes	No
If yes, please give address details		
Are you currently a Council tenant?	Yes	No
If yes, please give address details		
Telephone number of a family member/relative who does not live with you		

DECLARATION:

I declare that all the information given by me above is to the best of my knowledge complete and correct. If any false declaration is made it will render this application null and void and you will forfeit a housing opportunity.

Applicant's signature	Date
-----------------------	------

NOTE: Please include copies of your id book and your spouse/partners id book and marriage or death certificates.

APPENDIX F: Universal Access Review as approved by IDC Consultants

Universal Access review of RDP House, constructed in 2003

The review of the RDP house was conducted onsite with the verbal permission of the home owners (Antonia and Simon). The Universal Access Audit is intended to highlight the needs pertaining to universal accessibility related to this specific, set design of housing. It is to be noted that housing layouts differ depending on date of construction and area in which the development took place. This review was conducted in Maccassar (outside Sommerset West, Cape Town) on a development of housing that was built in 2003. The plot size on which the house is situated is approximately 160m² while the house takes up a mere total of 36m². This house is home to a family of six, which includes two children under the age of six years and has additional backyard dwellings built on the land to accommodate the ten extended family members.

Within the area in which the house that was reviewed was located, there was a small shop as well as a children's day care which were also reviewed as part of the this auditing process as these are both located within converted housing developments of the same size as the house that was reviewed.

Due to the year in which this development was constructed the SANS 10400 version that was applicable to this set of buildings is the 1999 version and so this audit was conducted on these sets of requirements but as these requirements were lacking in detail, other aspects that affect accessibility have been added to the this review process.

This review has been reviewed by IDC Consultants



Figure A: Plan drawing of the house that was constructed indicating size and the location of door and windows (Author's construct, 2015).

Images from onsite Audit	Comments and observations
 <p>Onsite Image 27: Street access to residential areas.</p>  <p>Onsite Image 28: Street access to the main road from the residential area.</p>	<p>A lack of pedestrian infrastructure makes navigation through the area increasingly difficult. With sand sprawled at the edge of the roads, pedestrians are forced to share the road with vehicles and although there are a limited number of vehicles that pass through this area, vehicles have the right to the road making this area specifically dangerous for children and vulnerable members of the community such as the elderly and people with various limitations. Levels of street lighting are low which could increase the occurrence of crime in the area. The conditions of the road surface in areas are less than ideal as sections of tere have fallen away or have been damaged during protests of service delivery.</p> <p>Throughout the area it was observed that there are high levels of activity in terms of exercise, along the main routes of vehicular traffic (including along the highway-N2), where running training is seen along all routes. The runners include small children as young as 10 years of age as well as older runners and people who are obese.</p>
 <p>Onsite Image 29: Street access to the house.</p>	<p>Access to the house is restricted, once again, by the location of soft sand between the road surface and the entrance of the house. SANS 10400 Part S of 1999 required that trafficable surfaces be stable, firm and slip resistant as surfaces that don't comply increase the difficulty in which the area is navigated by people in wheelchairs, the elderly as well as small children.</p>



Onsite Image 30: Entrance door to the house where the residents have built an extended stepped access to allow small children easier access to the house.

The foundation of the house has been raised by an estimated 250mm from the level of the road surface, it is expected that this was due to water drainage levels, however, once constructed the houses were left with a stepped access at the door of about 200mm. Based on SANS 10400 Part S of 1999 it was required that where stepped access is provided the riser of the step is required to be less than 170mm as well requiring an alternative means of access. The stepped access prevents access to the houses for people who use wheelchairs as well as increase the difficulty in which the house is accessed by the elderly.

In this case, as the residents have small children, they have built on an extended step to assist the children in gaining independent access to the house.



Onsite Image 31: Stepped access from the road to the entrance of the house.

The first step from the road side of the house to the entrance door is at least 100mm. The bottom of this step leads into an area filled with soft sand and so the full extent of the riser could not be measured accurately. The tread of this step is 1 meter in length and filled with large, loose bricks/stones which are cemented in place. SANS 10400 Part S of 1999 required that trafficable surfaces be level, stable, firm and slip resistant as surfaces that don't comply increase the difficulty in which the area is navigated by people in wheelchairs, the elderly as well as small children.



Onsite Image 32: Second step in the series of steps leading to the entrance of the house.

The second step from the road side of the house to the entrance door has a rise of at least 90mm. The step surface is failing and the total riser height is inclusive of the tiled surface seen in the background of the image. Any vertical change in floor level with a rise of 6mm or more restricts the access into the facility and it is then required that an alternative means of access be provided into the facility.



Onsite Image 33: Clear opening width of the entrance door.

The clear opening width of the entrance door barely meets the required 750mm. Entrance doors are required to have a minimum, clear opening width of at least 750mm to allow the thoroughfare of people using wheelchairs as well as people using crutches and walking aids as well as prams. Ideally doors would have a clear opening width of 800mm to allow for easier manoeuvrability through the space but 750mm meets the minimum requirements.



Onsite Image 34: Door installation that was poorly constructed and continually failing.

The walls around the entrance door have been poorly finished and are continually failing as small sections of the wall between the door frame and the wall fall to the ground when it's raining or excessively windy. The front wall of the house was not sealed for protection against adverse weather conditions and therefore allows water to penetrate the wall when heavy rains occur. Not only is this a discomfort for the residents but it also causes damage to their belongings.



Onsite Image 35: Electrical wiring that was residents have installed.

The house was installed without any plumbing or electrical fittings or without any consideration for their installation in the future. The residents of the houses installed their own plumbing and electrical fittings if they could afford the labour and skill for the installations. The houses were also constructed without any link to electrical or water services and these connections also had to be carried out by the residents.



Onsite Image 36: Sitting room area which is the space one enters into from outside through the entrance door.

The living area as well as the kitchen, make-up the majority of the internal space of the house. With a total external floor area of 36m² of surface area, with the kitchen and the living room taking-up 18m², without the width of the walls being taken into account. By moving in one couch set the internal circulation space in this area is restricted to 1 meter and less in some areas. This would not allow the movement of a person in a wheelchair, a pram or a person on crutches through this area.



Onsite Image 37: Internal kitchen space with little manoeuvring space and with all the plumbing installed by the residents.

The kitchen fittings have all been fitted and installed by the residents. The kitchen situated in approximately 9m² makes internal circulation space problematic. The location of a small kitchen table, to increase the surface working space within the kitchen, restricts free movements around the kitchen with the circulation space in some cases being restricted to a mere 450mm. Access to the kitchen cupboards are also restricted and the access to the fridge is limited due to the space restrictions. However it should be noted that all of the fittings and installations within the house were done so by the residents and more circulation space could be created by removing the kitchen table which would allow sufficient circulation space but would limit working surface area as well as removing the eating table.



Onsite Image 38: Alternative side of the kitchen illustrating the lack of manoeuvring space around the 3 meter wide kitchen.



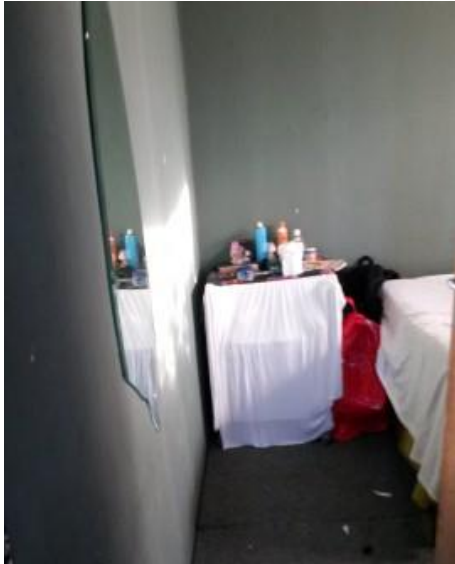
Onsite Image 39: Floor surface area as adapted by the residents.



Onsite Image 40: Floor level finishing that was installed by the residents.

The floor surface that was completed after construction was sealed concrete slabs. The concrete was sealed with sealer but the floors were left bare. The residents then installed tiles in the kitchen and living room as well a carpet in the main bedroom. The second bedroom still has a raw concrete floor. As the floors were unfinished the surfaces of the concrete has started to fail, leaving holes and uneven floor surfaces.

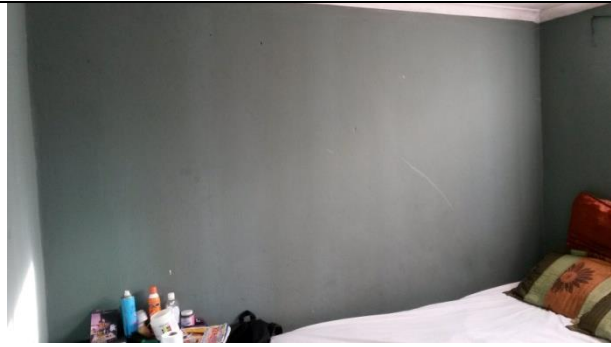
SANS 10400 Part S of 1999 required that trafficable surfaces be level, stable, firm and slip resistant as surfaces that don't comply increase the difficulty in which the area is navigated by people, and in this case it could cause a tripping hazard.



Onsite Image 41: Main bedroom with carpeted floor.

The main bedroom which is approximately 9m² has a carpeted floor surface that was installed by the residents. Onsite Image 44 below more clearly indicates the state of the window that is located in this room, which is unable to open.

Clear internal circulation space is limited to less than 1.1m once a double bed has been moved into the room and a narrow clothing cupboard behind the door.



Onsite Image 42: Wall to wall interior of the main bedroom.



Onsite Image 43: Ceiling installation that was done by the residents.



Onsite Image 44: The windows that were installed with the construction of the house are starting to fail.

The house was handed over to the residents with the wooden beams of the roof structure exposed. The residents had installed ceilings to assist with internal thermal control as well as neater means of installing lighting and electricity into the house.

The windows that were initially installed are not able to be opened due to the failing of the window frame and the poor construction around the window frame. The inability to open the windows leads to stuffy interiors and could cause secondary diseases due to the small space in which food is prepared, family time is spent and where people sleep.



Onsite Image 45: Toilet facilities are in the form of an outhouse.

Toilet facilities were not included into the house plans and instead a stand-alone toilet cubicle was installed on the corner of the property. The toilet is not accessible due to the small space in which is located as well as the stepped accessing. These limitations also restrict the use of the toilet by small children. The toilet facilities do not include any personal washing facilities such as a bath or shower. Residents still make use of an aluminium bath tub which they place somewhere in the house and fill with some water to wash.



Onsite Image 46: Backyarders are family and extended family and have installed windows and small patios for their comfort.

Based on Figure 2 below, the surface area of the plot that is accommodated by backyarders is an estimate 48m² and houses approximately ten family and extended family members. The backyarders do not have direct access to the house and have to walk around to the front of the house to access it or to make use of the toilet facilities.

The backyarders have installed windows and covered patio areas for their comfort.

The backyarders are located exactly there, in the backyard and are not visible from the road side of the house.



Onsite Image 47: Image of where the backyard dwellers have built up against the back of the house to secure their shacks.



Onsite Image 48: Backyarders house on the same property as the house.

In some cases the backyarders homes are neatly constructed with door thresholds that could comply with requirements for access. However due to the limited space available for manoeuvrability and circulation as well as the located of soft sand around the houses, these houses are not accessible to people who use wheelchairs or people pushing prams and is difficultly navigated by people using crutches. Though young children readily play in the sand around the houses, smaller children would have to be under strict supervision due to the uneven floor surfaces as well as the accumulating smaller bits of rubbish blown through the property by the wind.



Onsite Image 49: The local shop at a house converted for the shop.

The heavily fenced up shop serves the community with all convenience needs until late at night. The shop was built as an extension to the provided house. The window that is used as the serving counter is located at window height, which is 1.2 meters from the floor level. The floor finish at the “serving counter” is loose gravel and sand making this floor finish increasingly difficult for people to navigate over. SANS 10400 Part S of 1999 required that trafficable surfaces be stable, firm and slip resistant as surfaces that don’t comply increase the difficulty in which the area is navigated by people in wheelchairs, the elderly as well as small children.



Onsite Image 50: Pre-school converted from a house in the nearby area.

The pre-school in the area is a converted house and the owners of the school still reside in the house. The school building has been extended to accommodate more children. The windows have been replaced and a concrete slab was cast at the front door to decrease the rise of the step to access the building. An additional ramp has been installed to lead into the play area (sand pit) for the children, although the depletion of the sand over time has lead to the edges of the cast ramp being dangerously exposed.



Onsite Image 51: Internal rooms of the pre-school.



Onsite Image 52: One of the classrooms that was an original bedroom.

The house that was converted to the pre-school still has the exposed beams without a ceiling. The owners have installed lighting in some of the classrooms but the levels of lighting are very poor given that this is a place of education.

In terms of physical access to the school, once again the soft sand at the entrance makes access to the entrance door difficult, this is then further hampered by the location of the concrete slab outside the entrance door, which has a ramp which by no means complies with requirements as set out in the SANS 10400 Part S of 1999. Once the first step is accessed the step into the pre-school has a rise of 200mm, making access to the school difficult for even the children attending the school as well as parent who bring smaller children in prams.

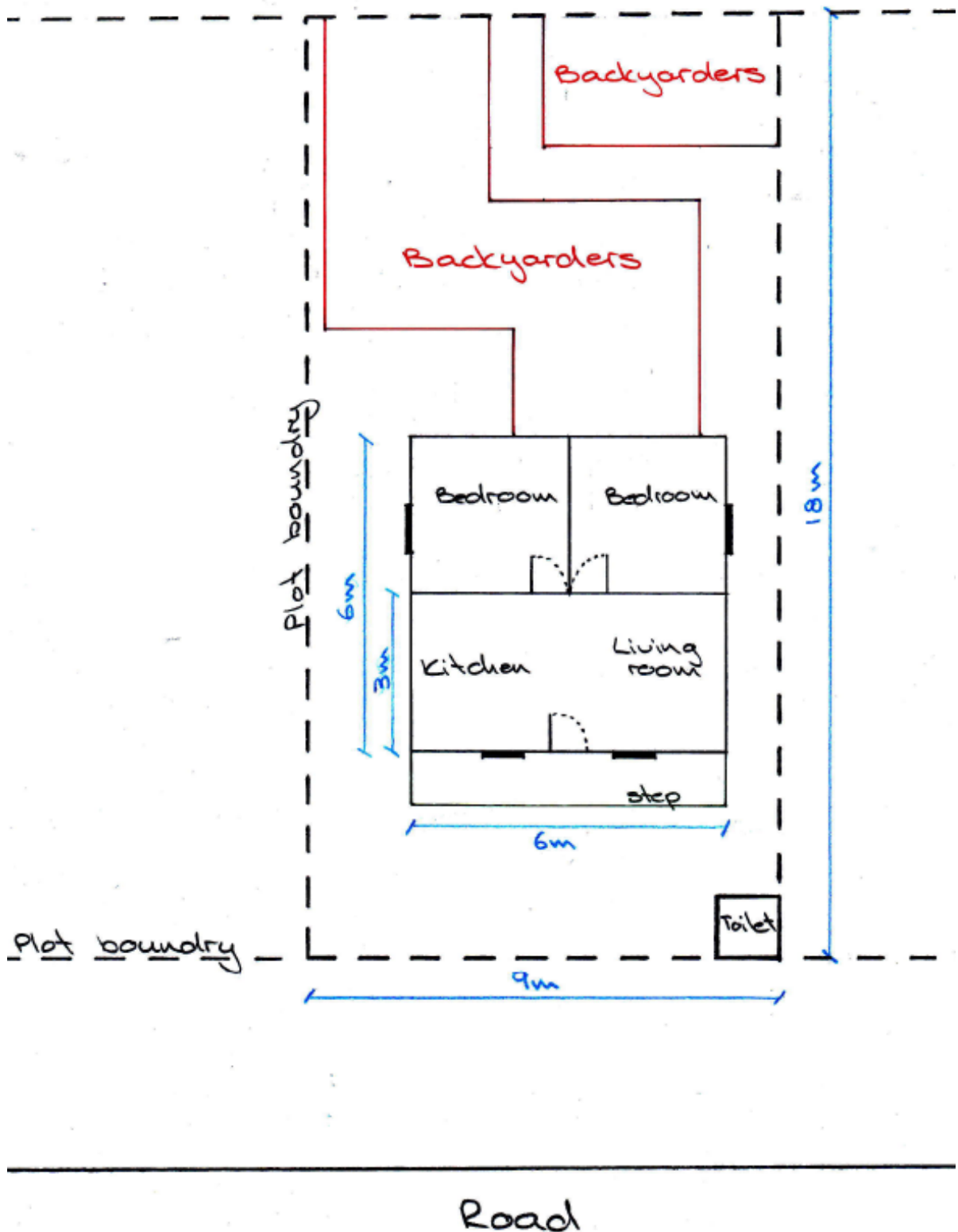


Figure B: The plot layout of the house as well as the location of the backyarder's houses. The toilet which is located outside the house on the edge of the plot of land nearest to the road has been plumbed and has water access. From the edge of the road to where the house plan commences and all around the house is covered in soft sand. This image also serves to illustrate the proportional use of land between the constructed house as part of the RDP programme as well as the backyard dwellers (Author's construct, 2015).

Universal Access review of Social Housing, constructed in 2013

The review of the social housing house was conducted onsite with the verbal permission of the home owners. The Universal Access Audit is intended to highlight the needs pertaining to universal accessibility related to this specific, set design of housing. It is to be noted that housing layouts differ depending on date of construction and area in which the development took place. This review was conducted in Flamingo Vlei (along the M5 towards Muizenburg, Cape Town) on a new stretch of land that was previously demarcated a section of the Zeekoei Vlei Nature Reserve. Construction of the development started in 2013. The plot size on which the house is situated is approximately 72m² while the house takes up 48m². This house is home to a family of four, which includes two children under the age of six years.

Within the surrounding area mass construction was being undertaken for the construction of a mall as well as a continuation of the housing development. The home owner of the house that was reviewed has been on the waiting list since 1997 and was granted occupation in April 2014.

Due to the year in which this development was constructed the SANS 10400 version that was applicable to this set of buildings is the 2011 version and so this audit was conducted on these sets of requirements but as these requirements were lacking in detail, other aspects that affect accessibility have been added to the this review process.

As the tenants are responsible for finishing the inside of the houses, it was requested from the home owner to give a cost breakdown of what is required to make the houses liveable:

Screed for the walls: R1100.00 for materials and labour

Paint for the internal walls: R1000.00

Tiling for the area where the kitchen is: R600.00

The bathroom is fitted with geyser pipes to and from the bath and basin but are not connected or fed through the ceiling as the houses are handed over without the installation of the geyser.

So, in total the materials and including some labour fees and excluding the cost and installation of the geyser is R2700.00 which in this case is the total monthly income for the household.

This review has been reviewed by IDC Consultants

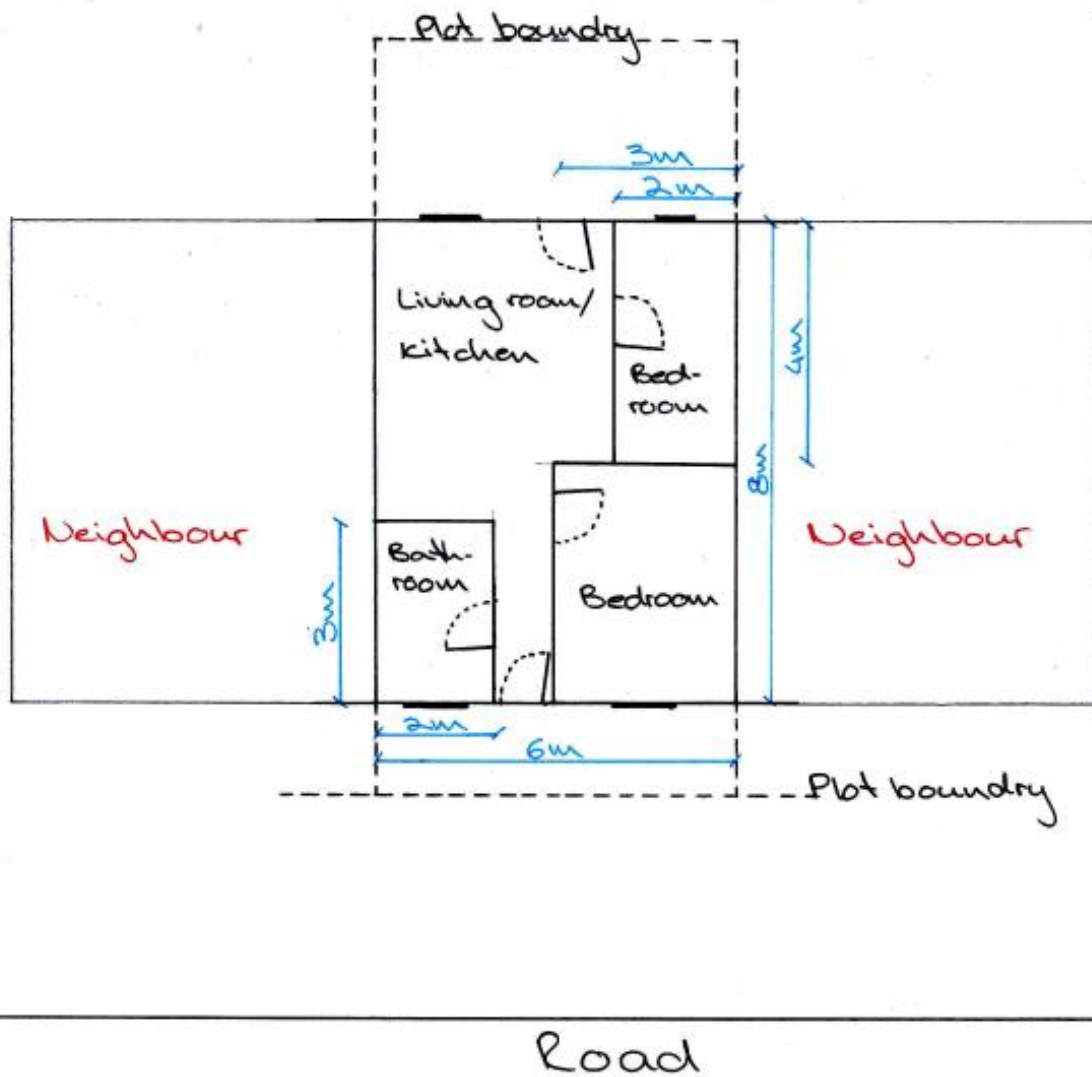



Figure C: Plan drawing of the house that was constructed indicating size and the location of doors and windows (Author's construct, 2015).

Images from onsite Audit	Comments and observations
 <p>Onsite Image 53: Sandy pedestrian routes through the housing development increase the difficulty with which the area is navigated.</p>	<p>A lack of pedestrian infrastructure makes navigation through the area increasingly difficult. With sand sprawled at the edge of the roads, pedestrians are forced to share the road with vehicles and although there are a limited number of vehicles that pass through this area, vehicles have the right to the road making this area specifically dangerous for children and vulnerable members of the community such as the elderly and people with various limitations.</p>



Onsite Image 54: Sandy access to the entrance of the houses could also lead to excess dirt in the homes.

As can be seen in the image, the location of street lighting is sparse and low levels of lighting contribute to increased crime in the area.

The road surfaces are in good condition.

There is a lack of identification of the houses. Navigation through the houses becomes confusing to new comers as they all look the same. Being able to distinguish between their houses could increase the level of ownership in the community.

The area is still generally under construction but as home owners have already started moving in the audit was conducted on the current conditions of the housing development. Access to the house is restricted, once again, by the location of soft sand between the road surface and the entrance of the house. SANS 10400 Part S of 2011 require that trafficable surfaces be stable, firm and slip resistant as surfaces that don't comply increase the difficulty in which the area is navigated by people in wheelchairs, the elderly as well as small children.



Onsite Image 55: Paved pedestrian walkway between houses to the central parking area

Incorporated into the development is a community area which doubles up as a car park for those who have vehicles. Walkways leading to this area as indicated in Onsite Image 55 are sufficiently wide enough to accommodate strollers and children on bicycles as well as wheelchair users.

The community area has planter boxes which are intended to encourage the people of the community to plant their own plant or vegetables in this area. However it is assumed that due to the location of these planters in the parking lot they are more likely to become communal braai areas.



Onsite Image 56: Central parking area with drainage in the centre of the lot and directly along the walkway leading to this area.



Onsite Image 57: Stepped access from homes leading to the parking area.

The walkways lead to connecting road surfaces, at which there is no painted or raised pedestrian crossings or dropped kerbs, making access to the community area and walkway problematic. Dropped kerbs are specified in SANS 10400 Part S of 2011, as well as layout and design of accessible parking. As this area is also a communal parking lot it is required to have at least one accessible parking space (SANS 10400 Part S of 2011). As the parking spaces have not been painted on this area, it could still be easily integrated into the layout if it was considered.

The common area also has drainage that is located through the centre of the area; SANS 10400 Part S of 2011 requires that drainage be relocated as it is in the path of travel, as seen in Onsite Image 56, where the pedestrian is walking straight along the drainage channel. Due to the costs associated with the relocation of the channel it is should rather be covered with a level grating in compliance with the regulations.

Houses with doors that lead onto the common area have a stepped access from the common area that was built in during construction as seen in Onsite Image 57. Access could easily have been achieved here through having installed a ramped surface in this area. If it is assumed that the rise of the two little steps to the door entrance is a total 150mm and the distance between the house and the common area is 1.5m the gradient of the ramp would be 1:10 which is less than ideal but still compliant with SANS 10400 Part S of 2011. The total rise of the steps is however more than 150mm but as the distance from the common area is 1.5m the gradient of the ramp would be less important than the ability to gain access to the houses. SANS 10400 Part S of 2011 requires that ramps have landings at both the top and the bottom of the ramp prior to any doors or windows but then discussions around

	<p>the floor level prior to construction should be held and in this case accessible access to the houses would be of more importance.</p>
 <p>Onsite Image 58: Stepped access at the entrance to a house which has a rise of more than 170mm which is non-compliant in terms of SANS 10400 Part S of 2011.</p>	<p>Houses located along general pedestrian routes and main vehicle routes also have stepped access at the front door but here it is treated differently as from around the common area. These houses have a 170mm (or more, in some cases 250mm) stepped access at the front door. SANS 10400 Part S of 2011 requires that a stepped access is not more than 170mm.</p>
 <p>Onsite Image 59: Various solutions have been put in place at the houses to overcome the sandy entrance and the high step at the entrance.</p>	<p>In some cases the households have made modifications, as best they can, to overcome the step prior to entering the houses. Neighbours have also admitted to leaving prams outside during the day as carrying them indoors numerous times a day is not feasible. Some residents have used bricks from the surrounding area to extend the stepped access to the houses to better assist in entering the houses.</p>
 <p>Onsite Image 60: Loose bricks are scattered near the entrance to houses to overcome the sandy routes around the houses.</p>	<p>Without the extended step at the entrance, the location of the lock on the door is too high to be easily used by home owners, which is another reason for the extensions of the step to the entrance.</p>

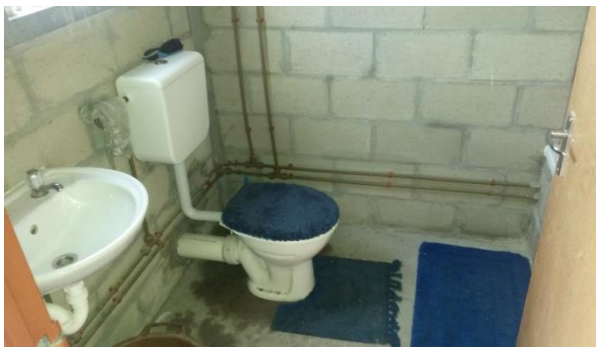


Onsite Image 61: Back entrance to the houses is also restricted by the location of a step at the door.

Access from the back door is also restricted by the location of a step. There is sufficient space in this area to have a ramp installed to overcome vertical height of 170mm or more. SANS 10400 Part S of 2011 requires that a stepped access is not more than 170mm.

The back entrances suffer the same fate the front access, where the step is too short to allow people to stand on the step whilst opening the door, but at the back of the houses the greening has already start which reduces the dust in the area as well as the dirt that is carried into the house from outside.

External greening is the responsibility of the owners as well as the maintenance thereof.






Onsite Image 62: Toilet facilities have all of the piping exposed which is a non-compliance issue within SANS 10400 Part S of 2011.

SANS 10400 Part S of 2011 requires that the exposed plumbing be covered and protected from exposure to users to protect them from injury. As indicated in Onsite Image 62, the exposed pipes are left unattached and not penetrating the ceiling to where it is assumed that the geyser would be connected.

The door opening and the location of the bath restricts the clear opening width of the toilet door. SANS 10400 Part S of 2011 requires that the clear opening width of the door be a minimum of 750mm, which could be achieved if the door was allowed sufficient space to open completely.

The internal configuration of the bathroom does not allow sufficient manoeuvring space internally due to the location of all of the amenities. SANS 10400 Part S of 2011 requires a clear internal space allocation of 1.8 meters by 1.8 meters. The location of the basin towards the front of the toilet would also be better aligned with the SANS 10400 Part S requirements.

 <p>Onsite Image 63: Exposed piping that is assumed to be connected to the geyser that has not been installed as part of the building completion.</p>	<p>Although in many cases a bath is preferred installation in the bathroom because it is easier for the use of children. If however a shower with an additional lowered tap was installed, it would allow for children to bath in small tubs and allow for adults to save water when showering instead of bathing.</p>
 <p>Onsite Image 64: Location of the electricity recharge unit.</p>	<p>The centre of the electricity recharging unit is located 1.8 meters from the floor surface. According to the requirements in SANS 10400 Part S of 2011, the centre of working elements that are intended for use should be no higher than 1.2 meters from the floor surface. Having an electrical recharging unit that is located at this height excludes people who are short in stature, competent children and seated users from gaining access to this facility.</p>
 <p>Onsite Image 65: Unfinished internal walls of the houses. Surface treatment needs to be executed by the new home owners.</p>	<p>Interior walls, as mentioned in the introduction, are left unscreeded and unpainted. This could have been a condition of the tender but now the finishing and sealing of the walls are left to the tenant's devices. This could be problematic, specifically in the bathroom area as areas where moisture could cause damage, the walls need to be treated very specifically to prevent the damage from occurring and these houses are semi-detached, any damage could move through to the neighbouring house.</p>



Onsite Image 66: Houses are fitted with minimal lighting.



Onsite Image 67: Houses are fitted with electrical points internally.



Onsite Image 68: Installation of the kitchen area without any wall surface treatment.



Onsite Image 69: Section of greening that belongs to the home owners.

The houses are fitted with lighting, but the levels are in some cases the minimum levels of lighting. It required that a reading of at least 180lux be measured on working surfaces but the layout of the kitchen is not conducive to the use of the installed lighting and therefore does not meet the requirements. As home owners are not likely to know the difference between good working light and bad, they are not likely to install additional lighting for the working areas.

Although it could not expected of the tender or contractors to include this level of detail in each home, additional lighting could be installed over the working area and the use or completion thereof could be left to the home owners.

Houses are fitted with electrical points which are beneficial to the home owners.

In the area where the kitchen sink has been fitted, similarly to the bathroom, there is no protection against water damage that is likely to occur in this area.

Leading from the main circulation routes and vehicle access, at the front of each house, there is a section of greening that has been intended for the home owners to tend to. The extended area that has been dedicated to vehicular parking is also illustrated in Onsite Image 69. The residents have argued that the majority of home owners do not posses vehicles of their own and make use of public transport and so the exaggerated parking area on their front door steps is a waste of space.



Onsite Image 70: Defensive home owners physically separate their turf at the entrances to their houses.

Residents have indicated that they would have preferred the option to have an extended front yard so that they could extend the stepped access to their houses or so that they could set-up their small business to run from their homes, as indicated in Onsite Image 70. The limited space in the front of the houses also limits the greening that could take place along the main road.

As there are currently no trees planted in this area, the only place where this could have taken place is in the front of house area. Houses would benefit from the neighbourly feeling that trees would have added to this area as well as the direct benefits such as shade and possibly protecting the houses from travelling vehicles in the main road.

The extension of the front gardening area should also therefore be accompanied by the division of the garden per house. People moving into their new homes are possessive of their new found space and prefer to have physical boundaries in place to seclude their area to a small degree.



Onsite Image 71: Children's play area between the houses was constructed by one of the neighbours for the neighbourhood children as the development lacked means of occupying children.

Safe and secure facilities for children within the community are essential. In this case residents acknowledged the need and took matter into their own hands and constructed a play for the children. The location of the play area is in a space where it could be observed by multiple housing units at once. This adds to the safety and security of the play area as parents are able to monitor the happenings in the area.

By providing an area for the children the parents are also assured that the smaller children are not playing in the streets where they cannot be monitored which leads to be better and safe community.



Onsite Image 72: Entrepreneurial activities taking place within the small confines of the semi-detached houses.

Residents reports that a numerous houses have small entrepreneurial businesses running from them. From small scale vendors to seamstresses, the home owners are dependent on the income from their business and the planning and the layout of the owners should have taken this into account.

Although it is not always possible to plan in all of these types of development within the community, a decision could have been made to facilitate these processes through a design intervention of the corner houses which could then have been allocated to existing entrepreneurs or people interested in starting a small home business. The overseeing body of the community are very strict in terms of what behaviour is deemed acceptable in the community and the security is well enforced. However, informal trading is bound exist in areas where people are some distance from any trading facilities. It is therefore suggested that the corner houses be dedicated to these types of activities to create a more formal means of trading for these small business.



Onsite Image 73: Mixed housing development increases the density of the area and reduces the distance that services need to be provided over.

Mixed housing developments within the community increase the density of the area and reduce the area in which services area required. Although the houses are the same square meterage as the semi-detached single storey houses, residents rather opted for the single floor houses because of the reduced space in the double storey due to the location of the staircase inside the houses.



Onsite Image 74: The location of the stairs in relation to the back door.

Due to the above reasoning the double storey houses that are complete and ready for occupancy are being used as storage spaces by people moving to the single storey houses. These problems could have been overcome and residents would possibly even have chosen the double storeys over the single storeys if the houses were made slightly bigger as it would have attracted more people.



Onsite Image 75: Near Flamingo Vlei is the community from which some residents were chosen to move into the new housing developments.

Surrounding areas to the new development is host to numerous people with disabilities as indicated in this Onsite Image. In areas where there are high levels of poverty people with disabilities are seldom seen, this is not due to them not living in the areas but rather that the access to services and facilities for them is limited which limits their movements through the community as well as their independence.

This image depicts small children playing on the edge of the street and pedestrian walkways which are unpaved which leads to the pedestrians using the streets to navigate the area which then leaves little room of vehicular traffic, reducing the safety of the pedestrians.