



**Using biophilic design as  
a tool for restorative  
architecture,**

*toward a wellness centre in Durban.*

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# Abstract

The urban environment we are faced with today, is a built-up landscape that is minimally connected to the natural environment. Modern urban design has resulted in planning models that tend to prioritise design for vehicles rather than people. The buildings that populate our cities, do not respond to local people and their needs, and create a vast disconnection between people and the natural environment. The culmination of these elements is an environment that induces stress and fatigue and could be detrimental to human health and overall wellbeing.

The city of Durban is no exception in the category of a concrete jungle, with a glaring absence in restorative architecture as well as the unconvincing connection between the natural environment and the built environment. There is a great need for restorative spaces within the city, that promotes healing and provides relief for the body, mind and soul, helping to attain human wellness.

This thesis explores how the influence of biophilia improves architectural design and subsequently enhances overall health and wellbeing. It examines the various ways in which the natural environment can be implemented within the built environment through biophilic design, which subsequently creates an environment that permits and promotes healing.

Restorative architecture is explored through the lens of biophilia and genius loci with a methodology that includes: an in depth analysis of existing literature, architectural case studies, precedent studies and semi structured interviews with healthcare and wellness practitioners. From the literature review, there were three fundamental themes that emerged, that being:

1. **Connect**, which deals with the site or building's connectivity to the context in a physical and visual way, it also explores how people are connected to the built environment, natural environment and each other.
2. **Captivate**, which deals with how the design of the facility stimulates the senses and captivates the interest of the user, for example, mobility and wayfinding, prospect and refuge and the use of natural colours and textures.
3. **Create** is about creating a sense of place or belonging, in turn, creating a sense of wellness.

These themes are carried through the paper, ultimately resulting in a set of guidelines that support the design of a wellness centre in the Durban CBD, which is in line with the aims and objectives as well as provides a solution to the research problem outlined.

# Declaration

I declare that the research reported in this thesis is my original research, except where otherwise stated. It is my own, unaided work, done exclusively by me under the supervision of Mr. Lawrence Ogunsanya. This dissertation is to be submitted to the University of KwaZulu Natal for the Master of Architecture degree and has not been submitted to any other university for any degree or examination before.

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Sareesha Reddy

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Date



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**My parents**, for the countless sacrifices you have made for me and for my career. Thank you for ensuring me that I am capable of anything and for the endless support throughout, what seemed, the most difficult times. Thank you dad, for showing me that there are no limits when it comes to your dreams. You inspire me.

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# **Chapter One**

Introduction and Background of Research

## 1.1 Background and motivation of the study

### 1.1.1. Effects of current urban environments

The term 'urban environment' does not have a widely accepted finite definition, but is described as having three major components, the physical infrastructure such as the transportation system, the land use component which refers to the spatial zoning of areas for different types of uses and the third component is the design which includes the city planning and arrangement of built forms (Handy et al, 2002). The urban environment people are faced with today, is a built-up landscape that is minimally connected to the natural environment. Cities foster environmental pollution, health risks and facilitate social segregation (Salingaros, 2015). Modern urban design and planning models are inclined to overlook certain human needs by prioritising design for vehicles rather than people, designing buildings that do not respond to local people and their needs as well as limiting access to the natural environment (Kellert, 2005). The culmination of these elements is an environment that induces stress and fatigue and could be detrimental to human health and overall wellbeing.

The city of Durban is no exception in the category of a concrete jungle, with a glaring absence in restorative architecture as well as the unconvincing connection between the natural environment and the built environment (Silaj, 2014). There is a great need for restorative spaces within the city that promotes healing and provides relief for the body, mind and soul, helping to attain human wellness.

### 1.1.2. Human wellness in the city

The term wellness is commonly referred to as an improvement in overall health and well-being (van den Berg et al, 2007). Instead of the conventional comparisons of sick or healthy and mind or body, wellness provides a view of health that includes a full range of vitality for life (Davies, 2011). If the concept of wellness is explored with this range, from disorder to moderate health, through to a thriving vitality for life, it then proposes that assistance is not only for the sick nor is it only the extremely healthy that can function (Huppert, 2009). Wellness is important for all people. Ideally, a wellness centre is a building that promotes wellness, either of the mind, the body or both. However, the existing wellness centres in Durban are either designed with no consideration for the restorative ability of architectural space or are inaccessible by a large percentage of the population.

### 1.1.3. Restorative Environments

A widely accepted definition of the term restoration was made by Hartig (2004) as, "the process of renewing, recovering, or re-establishing physical, psychological and social resources or capabilities diminished in ongoing efforts to meet adaptive demands" (p. 273). He further explains that even though restoration processes undergo regular forms of depletion in everyday life, irregular and insufficient restorative environments can evoke many negative effects on health and wellbeing (Hartig, 2004). The natural environment is known to improve physical and mental

well-being (Kellert and Calabrese, 2015) and should be heavily factored in the design of these centres to achieve a harmonious balance that addresses principles of social, economic and ecological sustainability (Aripin, 2007). The study of restorative architecture in Durban has been underestimated in its capability to improve the physical and psychological wellbeing of all people in the city.

## **1.2. Definition of the problem, aims and objectives**

### **1.2.1. Definition of the problem**

The problem of the study is composed of three parts: the conceptual component, which deals with human wellness, the theoretical part, which explores biophilia and biophilic design, and the socio-economic political component which deals with the current perception of wellness centres in Durban. The urban environment of Durban is a built-up landscape that does not permit or promote human wellness, neither does it facilitate sufficient interaction with the natural environment. The absence of restorative spaces and built form highlights a need for architecture that promotes overall health and wellbeing.

Existing buildings that offer wellness facilities lie outside of the city and are inaccessible to lower income groups. The use of nature as a means to promote wellness is something that these facilities do not have as well as the restorative capability of architectural space.

### **1.2.2. Aim of the study**

The aim of this research is to explore how the influence of biophilia improves architectural design and subsequently enhances overall health and wellbeing.

### **1.2.3. Objectives of the study**

1. To determine if a spatial connection to the natural environment is beneficial to healing
2. To analyse the current use of nature in wellness centres
3. To explore how nature may affect overall health and well being
4. To explore how the natural environment can be optimally integrated in the design of a wellness centre

## **1.3. Setting out the scope**

### **1.3.1. Delimitation of the research problem**

The subjects of human wellness, biophilia and genius loci are broad topics that can respectively be explored through numerous perspectives, situations, locations and groups of people. For the purpose of this study, an understanding of human wellness is necessary, more importantly, the optimum environment to permit and

promote overall health and wellbeing needs to be explored. This includes the natural environment and built environment, which is focused through the theory of biophilia, more specifically biophilic design. The location of the study is the city centre of Durban, this context is explored through the theory of genius loci and the proposed building is intended to act as an oasis in the concrete jungle of the urban environment. The proposed building is inclusive of all members of the public and the study touches on subjects of accessibility and the perception of wellness being reserved only for high income population groups in South Africa. An investigation guided by the research questions will ultimately result in a design brief and criteria for the proposed wellness centre.

### 1.3.2. Definition of Key Terms

- **Biophilia:** refers to the inherent connection that humans have to the natural living environment, that is, the affinity to nature that is experienced by people.
- **Biophilic Design:** a derivative of biophilia, is an application of nature and natural systems within the built environment through architectural design.
- **Wellness:** the concept of achieving a satisfactory level of overall health and wellbeing.

- **Restorative Architecture:** architectural space that permits and promotes healing and wellness.
- **Environment:** the composition of a space, building, street or urban place that is either constructed or natural and experienced physically.

### 1.3.3. Research Questions

#### Primary Question

- What is the effect of integrating biophilia with the built environment on overall health and wellbeing?

#### Secondary Questions

- What is the optimum environment for human wellness?
- What is the relationship between the natural environment and human wellness?
- How can aspects of the natural environment be integrated with the built environment through biophilia?

### 1.3.4. Research methods and materials

The topic of research is focused on creating an environment that is conducive to the healing process, the variables and outcomes are based largely on the user experience so a qualitative method of research would provide insight into the

feelings, thoughts and experiential journeys of the user. The data collection instruments I would use are:

- **Observations** – This would be instrumental in investigating the impact of current local wellness centres on overall health and wellbeing and noting the difference if any to wellness centres that implement biophilic design. A structured observation schedule will be constructed which details what the researcher is required to observe and how those observations should be recorded.
- **Semi structured interviews** – This primary source of data collection is important as the research topic is focused primarily on the user experience, it would be useful to make discoveries through the first hand experiences of various wellness and healthcare practitioners as well as service providers.
- **Document analysis** - This method of data collection from previous research such as books, journal articles and theses, is important for gathering information that can be used to gain an in-depth understanding of the elements of the research topic, that is, nature in the built environment, nature and healing environments and biophilia. It can also be used to make comparisons to existing investigations and discoveries related to the topic as well as provide insight into global projects that have similarities.

Probability sampling method for data collection would be used, specifically the stratified type. The reason for this would be to achieve a result that is reflective of all members of the population as there is an incredible diversity of people who

experience the city of Durban. The stratified type of sampling is more efficient than random sampling as this method reduces sampling error. “The researcher first identifies the relevant strata and their actual representation in the population. Random sampling is then used to select a *sufficient* number of subjects from each stratum.” (Stratpac. 2014: 1).

The case studies that will be researched in this study is the Hilton Health and Wellness Centre in the Kwazulu Natal Midlands and the Unkhumbane Community Health Centre in Cato Manor. The facility in Hilton is a private advanced technology centre that accommodates various healthcare and wellness service providers, an observation of the building would be useful to the study as it would provide an insight into the functional spaces, layout and circulation spaces required for a wellness centre. The Umkhumbane Community Health Centre is focused around the local community and their needs, which is an important element in this research. The design of the building also incorporates the natural environment and has components of biophilic design.

## 1.4. Document Outline

This architectural research document is made up of five chapters.

- Chapter One – **Introduction**

This explains the background of the study, it includes a description of the research problem and the focus of the study and its relevance. It introduces the context of the research, describes the methods of research and sets the framework for the following chapters.

- Chapter Two – **Literature Review**

The literature review is focused on outlining and exploring the key themes of the research, that is, human wellness, biophilia and genius loci. It reviews the various work on each theme by numerous authors and a fundamental theoretical argument is established. Each sub-heading contributes design guidelines for the proposed wellness centre, which are culminated into a list of design criteria in the conclusion of the chapter. There are also two precedent studies incorporated into this chapter, the Khoo Teck Puat Hospital and the Maggies Care Centre, both of which illustrate the points highlighted in the literature.

- Chapter Three – **Case Studies**

This is an analysis of the selected case studies, the Hilton Health and Wellness Centre and the Umkhumbane Community Health and Wellness Centre. Both

facilities were analysed based on the design criteria set up in the previous chapter, that of *connect*, *captivate* and *create*. The information analysed in this chapter were collected through secondary research as well as first hand observations of the facilities.

- Chapter Four – **Presentation of Data and Analysis**

This is an analysis of the primary data collected through interviews and categorised according to the main themes of *connect*, *captivate* and *create*. The interviews were conducted with professionals in the wellness industry and provide an insight into the different perspectives of nature and wellness.

- Chapter Five – **Conclusions and Recommendations**

The concluding chapter is a recap of the main themes and ideas that have been discussed throughout the paper. There are recommendations for the design of future wellness centres with a set of guidelines for creating wellness in architecture, creating biophilic architecture and for creating a sense of place. There is also a set of criteria for an optimal selection of a building site that has stemmed from the research. Finally, there is a conclusive discussion of the research questions in light of the study conducted.

## **Chapter Two**

Theoretical Framework and Literature Review

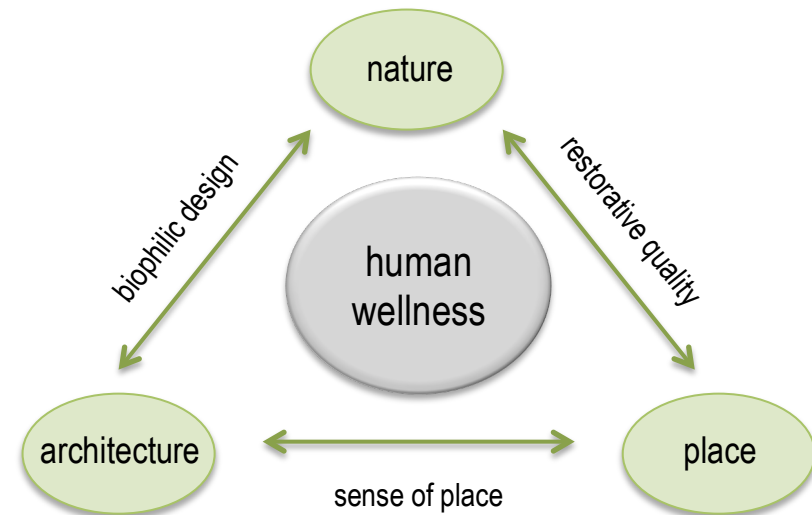
## 2.1. Introduction

Situated on the east coast of South Africa, Durban is the country's third largest city. It forms part of the eThekweni Metropolitan Municipality and is the busiest port in South Africa (Carmin et al, 2009). The city has a strong connectivity both on a national and international scale. The notion of Durban being an "arrival city" to southern Africa (Silaj, 2014) had resulted in a surge toward urbanisation.

The urban climate in Durban has been through a tumultuous past from its origin as a coastal settlement in 1825 (Machen, 2016), to the modernist planning of the apartheid government through to the city as it is known today. The resulting city structure is somewhat of a concrete jungle with very little relief between built spaces and minimal consideration for public gathering spaces. The city of Durban is no stranger to phenomena such as urban sprawl and urban decay with major investments and developments moving north out of the city (Silaj, 2014). The existing atmosphere in the city is lacking a restorative element and needs to reflect the diversity, vitality and richness of nature that is the essence of Durban and it's people. A place for wellness that promotes healing on all levels of the spirit, mind and body and is inclusive of all people despite social, economic, cultural or physical differences is what the city is missing.

In this literature review, there will be an investigation into the effect of the built environment, particularly restorative architecture, on human wellness. Restorative environments will be explored through the lens of Biophilia, and the integration of

nature and architecture. The overarching scope is the link between the design elements and theories discussed to the context of Durban, in order to create architecture that will promote wellbeing, and is also relevant to the city. The theory of Genius Loci is included in the discourse in order to identify a distinct character and evoke a sense of place that is crucial to the success of the design of the wellness centre as well as it being an urban intervention.



**Fig. 2.1. Flowchart showing links between concepts and theories** (Source: author)

Precedent studies of existing buildings will also be included in this chapter in order to illustrate the main concepts discussed and provide examples of the literature being reviewed.

## 2.2. Human Wellness

### 2.2.1 Introduction

Human wellness is a complex idea that receives many interpretations and definitions. In the context of this study, human wellness is the concept of achieving a satisfactory level of overall health and wellbeing. It is having a positive outlook on a psychosocial as well as a physical level (Dilani, 2008). Human wellness impacts the quality of everyday life, from how one may go about their daily activities to how one's efficiency or creativity is stimulated. There are numerous factors that may influence human wellness, however, this study will focus on the built environment and the natural environment being the major factors.

The Maggie's Care Centre in West London is an example of a building that promotes wellness and creates a restorative environment and will be explored further in this section. Designed by Rogers, Stirk, Harbour and Partners, the building provides support and a caring environment for those affected by cancer at any stage (Rogers and Harbour, 2010). It is affiliated with the Charing Cross Hospital in Hammersmith and is a welcoming retreat in the busy streetscape of London (maggiescentres.org, 2009).



Fig. 2.2. Maggie's Care Centre, West London (Source: McManus, 2014)

### 2.2.2. Health and overall well-being

According to Diener & Eunkook (Diener and Eunkook, 2000), wellness is interpreted as being more of an individualistic idea. The fulfilment of one's needs is an indication of a measure of satisfaction and happiness (Diener and Eunkook, 2000). This is a subjective wellness where it is representative of one's own perception of quality of life. In his book Motivation and Personality, Maslow also views wellbeing in a more individualistic sense, which is described in his hierarchy model of needs (Maslow, 1959):



Fig. 2.3. Maslows Hierarchy of Needs (Source: Maslow, 1990)

From this image, it can be seen that Maslow understood wellbeing as satisfying basic physiological self needs first then progressing to more complex, socially based needs. The social aspect of this pyramid shows us that other people are tasked with assuring a sense of belonging or acceptance for an individual.

In the city of Durban, many people are unable to fulfil even the basic physiological needs as described by Maslow (1959). It is of extreme importance for the proposed wellness centre to be socially accessible and to include all people. One of the ways this is implemented is through identifying and addressing the basic needs of the various users in the Durban context, these include: rest, food, protection from the weather and places for physical activity.

The World Health Organisation defines health as a state of complete physical, mental and social wellbeing, not just free from disease ((WHO), 2014). This outlook is shared by Eckersley et al, who writes about a holistic well being that encompasses all aspects of life such as the physical, mental, cultural, social, spiritual and financial wellbeing (Eckersley et al., 2006). The holistic perspective of wellbeing also focuses on participation and inclusion in a social context, which is somewhat included in Maslow's pyramid. It can be said, that an individual's vitality is linked closely with the social aspects of the place in which they live and exist (Eckersley et al., 2006). In an urban context, particularly of Durban, the city environment impacts the lives of the people who live and work there as well as visit.

### 2.2.2. Wellness and the Built Environment

Urban environments have a significant impact on the quality of life of individuals, for example in Durban, urban sprawl has a negative impact on wellbeing due to long commute times, poor public transport as well as physical and mental fatigue. The extent of the impact of the built environment is not just on individuals but also the wellbeing of entire communities collectively. Architectural environments, for the most part, have been designed in order to fulfil a few of the basic needs of individuals. Spaces were built for a specific purpose, where people were merely positioned in and controlled as to how the space should be used. Architectural environments have however, failed to address the more complex needs of people, those that arise on a social and psychological level as described by Maslow (Maslow, 1959). Architects influence human behaviour through design, this conclusion made by Kellert (Kellert and Calabrese, 2015) tells us that the built environment is a crucial aspect in the journey to attaining wellbeing.

The physical environment that one surrounds them with, affects the conscious and sub conscious self (Alexander, 2002). The physical environment inside a building, where people in the city spend most of their time, may include the following aspects:

- **Air Quality** – the indoor air quality of a space has both short and long term effects on health and wellbeing (Al horr et al., 2016). Sufficient natural ventilation with minimal exposure to external pollutants is required in order to create a holistic environment within the building. The landscape design of the

Maggie's Care Centre includes an array of Birch trees that wrap around the building, providing a filter for the noise and pollution of the surrounding urban landscape as well as offering a flourishing and peaceful backdrop (Annemans, 2012)



**Fig. 2.4. Birch Trees surrounding Maggie's Care Centre** (Source: Morgan, 2008)

- **Thermal Comfort** – occupants of a building need to be thermally comfortable in order to be at their most productive (Al horr et al., 2016). In the context of Durban, a building would need to have a cool climate for the hot and humid summer months without the excessive use of energy.
- **Light** – natural daylight is a crucially important factor in the physical environment of a building, it is proven to be conducive to the healing process (Al horr et al., 2016), and is an effective solution that can be included in the design process that will directly address the problem of a quality healing environment as well as increase the facility's energy efficiency. Natural light plays a significant role in the design of the Maggie's Care Centre, the interior space is all naturally lit and creates a transition for the user into a world that is much calmer than the surroundings (Annemans, 2012). There are unglazed roof lights that allow natural light into the garden spaces below (Rogers and Harbour, 2010).



**Fig. 2.5. Naturally lit interior of Maggie's Care Centre** (Source: McManus, 2014)



**Fig. 2.6. Naturally lit interior of Maggie's Care Centre** (Source: McManus, 2014)

- **Ventilation** – this is the process of circulating air in order to control the temperature, remove any moisture, odours or bacteria (Al horr et al., 2016). It

is important as it replenishes the oxygen in the physical environment of the building. Ventilation works to ensure a good indoor air quality.

Although the above-mentioned physical environment of the building, contributes to the wellness of the occupants, it still only addresses the basic needs required according to Maslow (Maslow, 1959). The following two sections of the literature review illustrates how architecture can address the more complex needs through biophilia and genius loci.

### **2.2.3. Impact of the Built Environment on Wellbeing**

Traditionally, the health issues that have been addressed in the built environment consisted of sanitation, toxic materials such as lead, safety and accessibility for people with disabilities (Jackson, 2003). In recent times, the built environment has been recognised for the enormous potential it holds in addressing a much larger scope of health concerns. These include depression, obesity, violence and social inequalities (Jackson, 2003). Christopher Norberg Schulz states that the environment influences our mood and so the built environment and human behaviour have a very close connection (Norberg-Schulz, 1980).

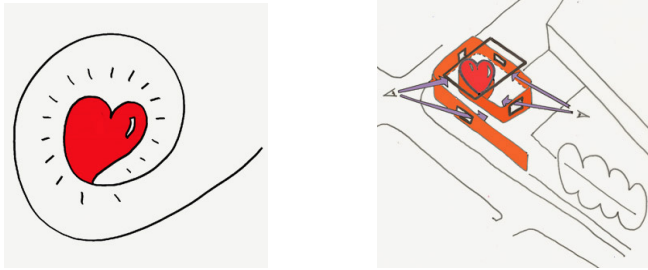
The negative impact of the built environment on overall health and wellbeing has been extensively explored through literature and investigative research. Sick building syndrome (SBS) is an example of the detrimental effects of ill-designed buildings. SBS is defined by Baker (1989) as the, psychological and physical suffering, which originates in the built environment (Baker, 1989). It is an actual ailment that displays symptoms that could be of a psychological or physical nature

(Stolwijk, 1991) such as depression, headaches, nausea and lethargy. It is caused by the inefficient design or reuse of buildings, predominantly in terms of climatic conditions such as insufficient ventilation or lighting (Niven et al., 2000). It could also for example be the inappropriate adaptation of a residential building to an office building.

Amongst the abundant literature on the negative impact of the built environment on human wellness, there are a few points raised on the positive impacts as well. If a building or built space is one that is designed to generate positivity and wellbeing, it has the ability to nurture, restore and heal its occupants. According to Baker, if a building is healthy and pleasant to occupy, the people using it will feel a sense of contentment (Baker, 1989). Kellert goes a step further when he explains that buildings should aim to look beyond the ideas of contentment and comfort, and should have positive environments that can contribute actively to the recovery and wellbeing of its occupants (Kellert and Calabrese, 2015). Reynolds speaks of how social and rehabilitative buildings are able to promote a level of social connectivity where people can create and develop relationships as well as reduce levels of stress (Reynolds and Kaplan, 1990).

The Maggie's Care Centre is an example of the positive impact of the built environment on human wellness. It was designed to contrast the oppressive surroundings, especially that of the overbearing adjacent hospital (Rogers and Harbour, 2010). The team of designers had a goal to make this centre a non-institutional building that would create a shelter from the intense urban environment (Annemans, 2012). The concept for the design is a "heart", represented by a

central double volume space, which is hidden away or protected by four wrap-around walls (Rogers and Harbour, 2010). The experience of the user is enhanced by a series of gradual turns upon entering that create an impression of being embraced (Annemans, 2012).



**Fig. 2.7. & Fig. 2.8. Architect's concept sketches showing central "heart" and wrap-around walls** (Source: Rogers, 2014)

The interior is exposed to the street only through cut-outs of the exterior walls, which makes it quite a sheltered place. The outside is painted a warm comforting orange while the inside provides warmth through the use of natural materials such as Birch panelling and Siberian Larch trimming (Rogers and Harbour, 2010).



**Fig. 2.9. Exterior walls sheltering the inside spaces and** (Source: McManus, 2014)



**Fig. 2.10. The use of natural materials creating a sense of warmth** (Source: McManus, 2014)

#### 2.2.4. Conclusion

The literature discussed tells us that human wellness is an important aspect, to not just the individual but also to communities, in improving the quality of life and living environment. Holistic wellness is a necessity that has long been ignored in the design world. The complex needs of people as seen in Maslow's pyramid (Maslow, 1959) shows us the further steps that need to be taken in order to attain self fulfilment in all aspects of life.

The perception of the wellness centre in the context of South Africa is for the most part, a luxury reserved only for the wealthy and high-income population group. This is an inaccurate description as the needs addressed by wellness centres, from behavioural care and dental services to nutrition and beauty, is a "fundamental human right" (Michopoulou et al., 2016). Dr Roy Jobson wrote an article titled, "Wellness in South Africa" where he noted, "it would also be important in South

Africa to ensure that Wellness is not perceived to be yet another luxury for the middle class or a predominantly wealthy and/or white phenomenon.” (Jobson, 2003). According to Maslow’s pyramid (Maslow, 1959), these complex needs of humans, which were often ignored in the past, need to be addressed in order to achieve a full spectrum of human wellness.

The built environment has the power to influence the behaviour of people, and so should be responsible for creating environments that are conducive to healing and that can enhance human wellness. Along with changing the social perception of wellness centres in Durban, the physical environment attributes within a building as discussed in this section is the first step in the framework for achieving a successful design of a wellness centre, as seen in the Maggie’s Care Centre. The next step would be the natural environment and how to integrate this useful tool for wellness, within the built environment through biophilia.

### 2.3. Theoretical Framework

The theoretical framework in this chapter explores the role of the natural environment in human wellness and the relationship of nature and the built environment with particular emphasis on the theory of Biophilia and biophilic design principles. The notion of a sense of place is an attribute of biophilic design but is explored further through the theory of Genius Loci.

## 2.4. Biophilia

### 2.4.1 Introduction

Biophilia has its beginnings in the book of the same title, written by Edward Wilson. Wilson defines it as the inherent connection that humans have to the natural living environment (Wilson, 1984). Stephen Kellert later expands on the idea of biophilia, stating that it is a crucial contributor to physical and mental health and wellbeing (Kellert and Wilson, 1993). This section of the study will explore how the natural environment affects human wellness and how it can be integrated into the design of the built environment to create architecture that promotes wellbeing and improves the quality of life for the occupants.

The Khoo Teck Puat Hospital in Singapore is an example of biophilic design being used in a healing environment and will be explored in this section. The architects RMJM came up with the concept of “the hospital in a garden” due to the natural surroundings of the site. It was driven by the utilisation of the natural environmental features such as the Yishun pond to the east of the site (Lit, 2012).



**Fig. 2.11. Khoo Teck Puat Hospital** (Source: unknown for <https://www.rmjm.com>)

## 2.4.2 Biophilia and Human wellness

The origin of the concept of Biophilia comes from an understanding of human evolution (Kellert and Wilson, 1993). According to Kellert, in the history of the human species, our kind has developed biologically to respond to natural forces as opposed to human created forces. From this, it can be said that our holistic being, both mind and body included, has evolved over the ages in a world that is “bio-centric” (Kellert and Heerwagen, 2008) and not human-engineered. Kellert explains that human wellness is highly reliant on a relationship with the natural environment and it is a necessity rather than a luxury in order to attain a life of fitness and satisfaction (Kellert and Calabrese, 2015). This view is echoed by Salingaros, when he describes biophilia as, “neither a simple liking nor an aesthetic preference, but a physical requirement equivalent to our need for air, water, and food.” (Salingaros, 2015). He also speaks of an inverse effect of biophilia, where the body signals the absence of the natural environment with illness and anxiety (Salingaros, 2015). More than just an affiliation toward nature, there is evidence that natural elements, such as vegetation and water, have a contribution to human wellness through restoration (Kellert and Calabrese, 2015).

In his paper, *The Restorative Benefits of Nature*, Kaplan (Kaplan, 1995) describes four components that are required to create a restorative environment:

- **Being away** – here, he refers to how a natural landscape, for example the seaside or mountains, is usually the preferred location for a restorative experience. This principle could still be applied to an urban setting, where the distance is not required but access to the natural environment could give a

sense of being away.

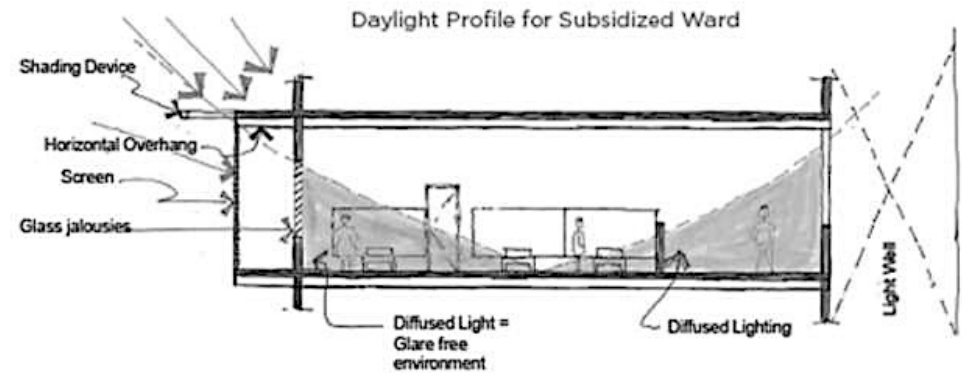
- **Fascination** – Nature is abundant with fascinating features and objects that seem to hold the attention of many people. These natural processes for example, a sunset or cloudy sky are soft fascinations that still allow the mind to wander and think about other things.
- **Extent** – A sense of extent can easily be experienced in a natural landscape but can also be possible in a small area. For example, trails and pathways can be designed to make small areas appear larger, Japanese gardens sometimes use this technique. Extent can also be interpreted conceptually, where a remnant of the past could be used to trigger an emotional response and connectedness to past eras, giving a deeper sense of extent.
- **Compatibility** – The natural environment and human inclinations are highly compatible. There are many people who find it easier to function in a natural environment rather than a structured one.

These criteria for a restorative environment forms part of the framework in creating a successful architectural environment that promotes wellness. It is clear that modern society has caused disconnect between humans and nature (Kaplan, 1995). The built environment, which is presently mostly devoid of nature, prevents humans from the beneficial experience of nature and prohibits our biophilic tendencies. The Khoo Teck Puat Hospital uses biophilic design principles in order to create a restorative environment, these include, ease of wayfinding, energy efficiency, scalability in design and a patient-centric design outlook (Lit, 2012).

### 2.4.3 Restorative and Biophilic Design

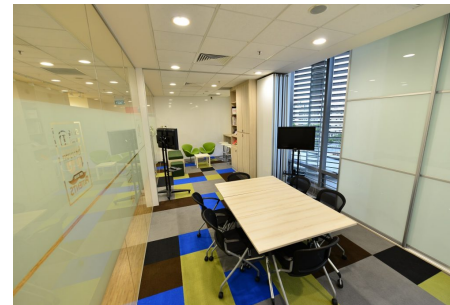
The prevailing paradigm in the current world of design poses a great obstacle to the positive experience of nature. Although the habitat of contemporary society has for the most part become the indoor built environment, where 90% of time is spent, there is still an inherent need for contact with nature, which is critical to human wellness. Salingaros explains that buildings that are designed to offer the greatest feeling of wellbeing for the user and have a structure that ignites a healing process in the body. This makes the user want to frequently experience such a building (Salingaros, 2015). He goes on to describe how the human sensory organs and systems has evolved in a way that responds to the natural geometry that exist in nature, which are colours, fractals, scale, and complex symmetries (Salingaros, 2015). According to Salingaros, there are eight major contributing factors that illustrate how biophilia can be integrated into architecture that is beneficial to health.

**Light** – Biologically, human beings require natural light for the function of two major organs, the eyes and the skin. Natural light is required for stereoscopic vision, that is, for three dimensional images as well as depth perception. The skin requires natural light for vitamin D, which is needed for metabolic processes in the body. The architects of the Khoo Teck Puat Hospital were able to maximise daylight and reduce glare, providing a diffused natural light for the spaces of the hospital (Lit, 2012)



**Fig. 2.12. Section showing design strategy for optimal natural light** (Source: Lit, 2012)

- **Colour** – The perception of colour is one of the human senses that can be linked directly with emotions. It is proven that colour and harmonies of colour affect the psychological mood.



**Fig. 2.13 & Fig 2.14. The use of colour to enhance the physical environment**

(Source: unknown for <https://www.rmjm.com>)

- **Gravity** – Human beings relate to and understand balance through the force of gravity. In nature, structures that exist are heavy at the bottom and light at the top. In traditional architecture, there is usually a “forced perspective” where the scale intentionally shrinks as you gaze upward, this gives the body a reassurance of a gravitational balance, which reduces stress.



**Fig. 2.15. Forced Perspective** (Source: unknown for [www.sia.org](http://www.sia.org))

- **Fractals** – These are structures that are complex in geometry at varying scales, they are frequently found in nature, for example cauliflowers or fern leaves. They have clear sub divisions and a hierarchy of scales. Since many systems in the human body such as the lungs are fractal, humans respond positively to fractals.



**Fig. 2.16. Fractal structure of the roof gardens** (Source: unknown for <https://www.rmjm.com>)

- **Curves** – Like fractals, curves are found everywhere in the natural environment as opposed to straight lines and right angles. The symmetry of curves gives them a natural balance, which then evokes an emotional pleasure in humans.
- **Detail** – In the natural environment, there exists a highly organized and complex detail, which is visible at any scale. The sense of touch for human beings requires a structure or texture that can impart a level of information. Natural materials like stone or wood provides a sense of information and interest through its intricacy and detail



**Fig. 2.17 & Fig 2.18. Detail of reception area and public restrooms, showing use of natural materials** (Source: unknown for <https://www.rmjm.com>)

- **Water** – The mere presence of water can be beneficial to human wellness, there is an affiliation to the sound, the feel and the sight of it. Water is essential to survival and so there is a cognitive attraction to it.



**Fig. 2.19. The Yishun Pond as a central feature of the hospital**  
(Source: Lit, 2012)



**Fig. 2.20. The use of water as a design element in the lobby**  
(Source: unknown for <https://www.rmjm.com>)

- **Life** – This would be the apparent meaning of biophilia, humans require the companionship of plants, animals and other humans. The actual life interaction with the natural environment is nourishing



**Fig. 2.21. Rooftop Farming as a community initiative** (Source: Lit, 2012)



**Fig. 2.22. Staff maintaining the gardens** (Source: Lit, 2012)

Kellert speaks of how biophilic design should aim to establish a good habitat for people, who he sees as a biological organism, in the current built environment, a habitat that would improve people's health, fitness and wellbeing (Kellert, 2015). He goes on to describe a set of principles that are representative of conditions required to practice biophilic design (Kellert and Calabrese, 2015).

1. Biophilic design requires repeated and sustained engagement with nature
2. Biophilic design focuses on human adaptations to the natural world that over evolutionary time have advanced people's health,
3. Biophilic design encourages an emotional attachment to particular settings and places.
4. Biophilic design promotes positive interactions between people and nature that encourage an expanded sense of relationship and responsibility for the human

and natural communities.

- Biophilic design encourages mutual reinforcing, interconnected, and integrated architectural solutions.

These principles involve the application of variable design strategies, which Kellert describes as experiences and attributes (Kellert and Calabrese, 2015). The attributes of biophilic design include the *direct experience of nature*, which is the actual contact with natural environmental features in the built environment, the *indirect experience of nature* is contact with images or representation of nature for example natural materials, and finally there is the *experience of space and place*, which are spatial features distinctive of the natural environment, for example prospect and refuge and way finding (Kellert and Calabrese, 2015).

Direct experience of nature	Indirect experience of nature	Experience of space and place
<ul style="list-style-type: none"> <li>Light</li> <li>Air</li> <li>Water</li> <li>Plants</li> <li>Animals</li> <li>Weather</li> <li>Natural landscapes and ecosystems</li> </ul>	<ul style="list-style-type: none"> <li>Images of nature</li> <li>Natural materials</li> <li>Natural colours</li> <li>Simulating natural light and air</li> <li>Naturalistic shapes and forms</li> <li>Evoking nature</li> <li>Information richness</li> <li>Age, change, and the patina of time</li> <li>Natural geometries</li> <li>Biomimicry</li> </ul>	<ul style="list-style-type: none"> <li>Prospect and refuge</li> <li>Organized complexity</li> <li>Integration of parts to wholes</li> <li>Transitional spaces</li> <li>Mobility and way finding</li> <li>Cultural and ecological attachment to place</li> </ul>

**Table 2.1. The Attributes of Biophilic Design** (Kellert and Calabrese, 2015)

Current trends in biophilic design see the convergence of technology, people and nature. Innovations in materials and technology are catapulting forward and allows for design to better match form to function (Grenville, 2017). Opposed to the rigid monolithic forms of the past, the current trend in biophilic design sees an emulation of nature’s designs, which are flexible, curved and organic and include variety, randomness and diversity (Oakley, 2017). Based on the concept that the natural environment is constantly changing, the design world is responding to this by creating more dynamic designs, such as the use of dynamic glass (Oakley, 2017) that slowly darkens to protect against direct sunlight, while preserving the view and connection with the outside environment.

#### 2.4.4. Biophilic Cities

A biophilic city is categorised by integrated, multi scaled, highly connected natural systems and features. This presents an opportunity to facilitate interactions with nature in the city, for example, creating a network of trails that connects parks and other green spaces. These connectors will allow people to walk, bike, and jog between numerous green spaces without having to leave the natural environment (Beatley, 2016). Biophilic cities will in theory, instill experiences of wonder and awe and according to research, awe provides meaning and deeper engagement in our lives, contributing to overall wellness.

The literature on Biophilic cities (Beatley, 2016) talks about biophilic conditions and infrastructure, some of which are:

- A close proximity to parks and green space
- Fair distribution of nature
- Green design features such as green rooftops, green walls and gardens
- Flora and fauna within the city

#### 2.4.5. Conclusion

Biophilia and biophilic design plays an important role in human wellness, as seen in the literature reviewed. It has a great, positive impact on health and wellbeing and should be factored into the design of all architecture. The literature on biophilia has revealed many similarities in the ideas of different authors, all leaning toward the imperative use of biophilic design principles in the built environment. Salingaros and Kellert, more specifically, have outlined a set of criteria for biophilic architecture, which can be compared with many similarities in design principles between the two authors. However Kellert has expanded into more detail in his criteria. This research provides the next step of the design framework for the wellness centre, it addresses the more complex needs of people that Maslow has discussed (Maslow, 1959). It is a practical methodology for a more effective design paradigm in the built environment, which is illustrated to an extent in the example of the Khoo Teck Puat Hospital. Kellert has gone further in his work, including the design attribute of *the experience of space and place* (Kellert and Calabrese, 2015). This is an integral part of the framework for creating a holistic wellness centre that is inclusive of all people in the city of Durban. It touches on the idea of a cultural and ecological identity of place (Kellert and Calabrese, 2015), which is in line with the next section of the study, the theory of genius loci.

## 2.5. Genius Loci

### 2.5.1 Introduction

Genius Loci is Latin for “the genius of the place” (Relph, 2015) it originated in Ancient Rome, where it was used to describe the concept of the protective spirit of a place. In modern times, the phrase stems from the philosophical theory of architectural phenomenology (Norberg-Schulz, 1980) and is explored most notably by architect Christian Norberg Schulz. “Spirit of place” or “sense of place” is an important concept in this study as it relates to human wellness as well as biophilia. The distinctive atmosphere and identity of the city and the people of Durban is something that needs to be captured and reflected in the design of the wellness centre.



Fig. 2.23. Te Mirumiru by CASA captures the spirit of place, emulating the New Zealand landscape. (Source: Devitt, 2012)

## 2.5.2 Understanding Genius Loci

Norberg Schulz explains that upon experiencing a place, there is a conscious and subconscious feeling that is evoked (Norberg-Schulz, 1980). He describes the concept of genius loci as the sense of a place that people acquire, inclusive of all the physical and symbolic attributes of nature and the human environment (Norberg-Schulz, 1980). Yi-fu Tuan describes how genius loci relates to a person's psychology, and how different environments can bring about different emotions (Tuan, 1977). The natural environment of a place heightens one's interpretation and relationship to that place (Relph, 2015). Genius loci in a physical environment can be categorised into four major aspects (Norberg-Schulz, 1980):

- Topographical landscape
- The natural conditions of a place, specifically the sky and natural lighting
- Buildings
- The symbolic and existential meanings in the culture of a place

The features in the topographical landscape of a place are the root of its "natural conditions", these natural conditions include the changes that occur within natural cycles, such as light and vegetation (Jivé'n and Larkham, 2003). This characteristic natural rhythm can be seen as the genius loci of a place, which needs to be considered when designing the built form.



Fig. 2.24. **Awaji Yumebutai International Conference Center by Tadao Ando**  
**integrating the natural topography of the site.**

*(Source: www.deiqnrulzcom, 2016)*

## 2.5.3 Genius Loci and Architecture

The design paradigm brought about by the modern movement in architecture has looked at the analysis of a site from a scientific perspective, for example optimal sun angles and circulation distances (Jivé'n and Larkham, 2003), without looking deeper into the site or place itself. The application of this formula for design has caused rapid growth in cities over the last century and has amounted to neighbourhoods that are sterile and faceless (Artibise, 2010).

In recent times, contemporary society have become most familiar with the urban environment and built form. The urban landscape therefore plays an important part in making places that are distinctive and special (Vogler and Vittori, 2006), and allow for people to identify and familiarise themselves with. City elements and features that are indigenous to the location and people, adds to the character or feel of the city (Artibise, 2010), making it a unique experience which is conducive to wellbeing. The use of traditional architectural styles and character is a way of preserving a historical sense of place (Relph, 2015) within cities and within the buildings themselves. The concept of genius loci when applied to architecture, forces the designer to consider the social, political, cultural, geographic and topographical aspect of each project site and develop the architecture with a sense of individuality (Behnisch, 2010). This would mitigate the kind of architecture existing all over the world that was made to ignore local conditions (Behnisch, 2010) and have become a contributor to globalisation. There are serious consequences of creating architecture that is void of place, it lacks a sense of belonging to the local people and is therefore not embraced or used to its full potential, becoming dead space that does not contribute positively to its location. Buildings “without place” lack a familiarity of character and feeling of comfort, which could result in people not feeling welcome or included, accentuating a feeling of exclusivity. Place based design guidelines are mentioned by Kellert as a comprehensive list (Kellert and Heerwagen, 2008),

### **Place-based relationships**

- Geographic connection to place
- Integration of culture and ecology
- Avoiding placelessness
- Cultural connection to place
- Ecological connection to place
- Historic connection to place
- Indigenous materials
- Landscape ecology
- Landscape features that define building form
- Landscape orientation
- Spirit of place

Environments that are restorative and promote a sense of wellbeing would have to evoke a sense of place for the user. Many theorists, as reviewed earlier, have explored the quality of human experience and wellness in relation to place, both the natural and built environments. The sense of identity that culminates from architecture, that has considered genius loci, may have a meaningful effect on human wellbeing and addresses the more complex needs of humans. The concept of genius loci is a crucial factor in creating an urban intervention, which will not only promote wellness of individuals but also of communities as is the intent for the proposed wellness centre in the city of Durban.

## 2.6. Conclusion

Attaining human wellness through the built environment includes an abundance of opportunities and an extensive range of criteria. The literature has revealed two parts of human wellness, health and wellbeing or feeling good and functioning well (Steemers, 2016). In order to enhance human wellness, architecture needs to progress past improving basic design parameters like temperature and humidity and move to a holistic design approach that encourages positive human behaviour (Steemers, 2016). This can be compared to the Maslow pyramid (Maslow, 1959) and how there are complex human needs, beyond the basic that are to be addressed in order to attain self-fulfilment.

As shown through the literature, biophilic design is a practical methodology that can be implemented in the design of the built environment. It is a means by which architecture can contribute to fulfilling those complex human needs thereby promoting overall health and wellbeing. Place-based design is another concept explored in this chapter through the study of Genius Loci. According to the research, in order for an environment to be restorative, there needs to be an experiential sense of place for the user (Relph, 2015). The culmination of this chapter is a design criterion that would include indoor environmental quality aspects, biophilic design principles and the concept of genius loci. Using this framework for design, the wellness centre would need to:

Connect	Captivate	Create
<ul style="list-style-type: none"> <li>• Increased quality and quantity of social connections</li> <li>• Include public open spaces and access to nature</li> <li>• Be accessible and close to other communal resources like public transport</li> <li>• Have a pedestrian oriented environment</li> <li>• Community participation</li> <li>• Strong connection to site</li> </ul>	<ul style="list-style-type: none"> <li>• Instil the use of nature to stimulate the senses</li> <li>• Capture interest of surrounding landscape</li> <li>• Apply Biophilic design principles to promote well being</li> <li>• Restore wellness through an experience of architecture and nature</li> </ul>	<ul style="list-style-type: none"> <li>• Stimulate creativity through architectural space</li> <li>• Create a sense of place</li> <li>• Create a community hub</li> <li>• Create a wellness-based environment</li> </ul>

**Table 2.2. Summary of Design Guidelines** (Source: Author, 2017)

When these guidelines are applied to the context of the Durban CBD, it entails a wellness centre in the midst of an urban environment of a sub tropical climate, an environment that needs care and attention. It is aimed to provide an oasis for the people of the city who do not currently have such an outlet for everyday stress and even long-term anxiety. The use of nature through biophilic design is meant to rejuvenate and enrich their lives in a place they feel comfortable and cultivate a sense of belonging. The culture of the people of Durban is a plethora of diversity and will be factored in the design principles as discussed in the concept of genius loci.

## **Chapter Three**

Case Studies

### 3.1. Introduction

There are two case studies that will be analysed in this chapter, the first is the Umkhumbane Community Health Centre situated in Cato Manor, the building was designed by Robert Johnson Architects in association with ZAI Architects. The building was completed in November 2003. The second case study is the Hilton Health and Wellness Centre in the small town of Hilton in the Kwazulu Natal Midlands. It was designed by A3 Architects and construction was completed in October 2015. These case studies are analysed according to the literature review and theoretical framework of the previous chapter. Elements of human wellness, biophilic design and genius loci will be examined through the lens of the summarised design guidelines (refer to Table 2.) that is:

- Connect
- Captivate
- Create

The theme of **connect** deals with the site or building's connectivity to the context in a physical and visual way, it also explores how people are connected to the built environment, natural environment and each other. The theme of **captivate** deals with how the design of the facility stimulates the senses and captivates the interest of the user, for example, mobility and wayfinding, prospect and refuge and the use of natural colours and textures. Lastly, the theme of **create** is about creating a sense of place or belonging, in turn, creating a sense of wellness.

The data used in this chapter was collected through secondary research as well as first hand observations of the buildings.

### 3.2. Umkhumbane Community Health Centre



**Fig. 3.1. Aerial map showing location of Umkhumbane Community Health Centre** (Source: Google Earth, edited by Author. Accessed: 30 May 2017)

### 3.2.1. Justification of Case Study

The Umkhumbane Community Health Centre is situated in the area of Cato Manor, which is not far from the Durban CBD. The area has somewhat of a tragic past, as it has been a site of forced removals of the Apartheid government. It is now a fast growing population that is comprised of low-income communities who often live in informal settlements. The health centre is a response to the needs of the growing community. It serves as a good example in terms of a case study as it is a facility that is inclusive of everyone in the community, which is a quality that would be implemented in the design of the wellness centre. It is also designed with the idea of a “Place of Wellness” (Johnson, 2011) in mind, where it would include services that focused on lifestyle, nutrition, fitness, urban agriculture as well as various forms of therapy and counselling (Johnson, 2011). The idea of wellness as a core principle makes this case study extremely relevant for this study.



**Fig. 3.2 Pedestrian waiting area on the east side of building** (Source: unknown for [www.kznia.org.za](http://www.kznia.org.za))

### 3.2.2. Connect

The health centre was intended to complement the already established primary healthcare facilities in the Greater Cato Manor development area (kznia.org.co.za, 2014), which provided an opportunity to broaden the function of the spaces in the building such that it is not restricted to healthcare. This brought about an array of community driven design responses such as the provision of space for health and youth programs, place for religious worship as well as community building activities such as gardening (Sanders, 2011). The idea was that tertiary education institutes would provide many of the services as part their post graduate and practical experience programmes (Johnson, 2011). The construction of the health centre also gave many local labourers an opportunity to participate in the process. The design process included a strong connection to the community of Cato Manor.

The site is located within the Cato Manor Central Node, according to the Greater Cato Manor Structure Plan (Johnson, 2011). The plan stipulates urban development objectives within the precinct that include (Johnson, 2011):

- Pedestrian – responsive ‘build to line’ edge conditions
- A ‘fine grain’ of development
- A density of development of 2-3 storeys

This ensures that the health centre is connected to the street edges and subsequently the pedestrians. To further enhance this connection, the road on the eastern boundary was recognised as the intended high street of the central node precinct and the design of the health centre proposed the main entrance be off this

road as well as other components that may serve the public with pedestrian oriented activities always being the priority (Johnson, 2011).

### 3.2.3. Captivate

The architect was most concerned with creating a clear and unmistakable patient circulation route through the building. This concern translated into the idea of a “shopping mall” for healthcare services that would be strategically grouped and accessed off a main circulation “spine” (zaiarchitects.co.za, 2014).

According to the architect, a significant element of the health centre is its hybrid quality. There are youth activities, church services and a provision of space for traditional healers and food vendors who sell fruit and vegetables in the waiting area (Sanders, 2011). The duality in functions of the spaces caters to the different types of patients and professionals making the centre more holistic.

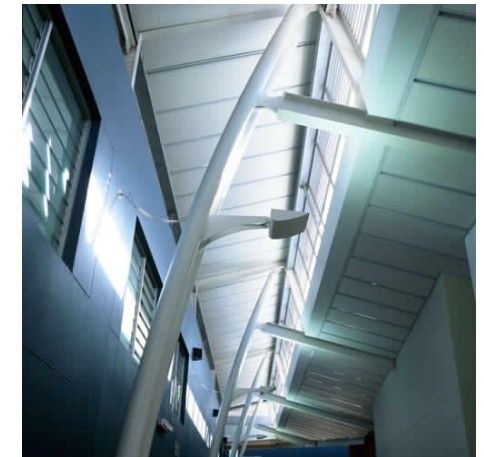
The structure has large spanning mono-pitch roofs that meet at a central roof monitor, and are supported by pairs of curved columns (Johnson, 2011). These large spans facilitate the variety in room sizes and the roof monitor provides natural light and ventilation to the circulation spine, which has the feel of a shaded avenue with places to rest along the way (Johnson, 2011). The repetition of the curved columns resembles a ribcage, which is an architectural metaphor. The orientation of the building allows for north-easterly breezes through the entrance and into the circulation route, keeping it ventilated naturally.

The inclination of the interior walls is a contrast to the right angle commonly found in building designs and creates a rhythm or sense of movement in the space (Sanders, 2011). It assists in providing relief and moving away from the sterile environment found in many healthcare buildings. The interior finishes boasts a variety of colours and textures such as the mosaic pathways along the main circulation route. The north edge provides patients with a view of the natural greenery nearby, allowing for an interaction with the natural environment.



**Fig. 3.3. Main circulation spine and mosaic textures**

(Source: unknown for [www.kznia.org.za](http://www.kznia.org.za))



**Fig 3.4. Roof monitor and curved columns**

(Source: unknown for [www.robertjohnsonarchitects.co.za](http://www.robertjohnsonarchitects.co.za))

There are a few biophilic design elements used in the design of the health centre such as the orientation, versatility of spaces, courtyards for gardening, the rhythmic structure and the variety of materials and textures. However, some of these

interactions with the natural environment are somewhat hindered, for example, the sliding folding doors to the courtyard spaces remain closed for the most part, not allowing users to experience these outdoor spaces (Sanders, 2011) and some of the planters along the street edge are barren and require maintenance.



**Fig 3.5. One of the urban agriculture gardens** (Source: Sanders, 2011)

### 3.2.4. Create

The building has an overall welcoming feeling, it is a place that the people of the community feel comfortable in and have claimed ownership of. The design is successful in creating a sense of place through the extensive and effective attempts at community participation. For example, there is a vegetable garden on site that is tended to by the community, this spirit of teamwork and the direct interaction with nature stimulates the creativity of the individual as well as the group.

The concept of a “place of wellness” is not properly executed as the facility is now primarily medically oriented with not much emphasis on the holistic wellness that was intended. An example would be the envisioned commercial gym, which could be accessed by the public and also linked to the Rehabilitation Department, even though the space was provided, the gym was never created. This type of functionality would introduce another dimension to the community health centre, emphasizing human wellness and providing more opportunity for the people of Cato Manor. It would also create more of a public node and improve the defensible quality of the space after working hours (Sanders, 2011).

### 3.3. Hilton Health and Wellness Centre



**Fig. 3.6. Aerial map showing location of Hilton Health and Wellness Centre**

*(Source: Google Earth, edited by Author. Accessed: 30 May 2017)*

#### 3.3.1. Justification of Case Study

Located in the Kwazulu Natal Midlands, The Hilton Health and Wellness Centre was a response to a niche identified in the healthcare market of the area, that being

a considerable shortage of rooms at major hospitals in Pietermaritzburg (voightsgroup.co.za, 2016). It is situated next to and has the same entrance gate as the Life Hilton Private Hospital. The two buildings are said to have a symbiotic relationship and the different functions of each, the hospital being primary healthcare while the health and wellness centre being healthcare-related services, complement each other (hiltonhealth.net, 2017). The Hilton Health and Wellness Centre is an appropriate study due to the actual function of the building, that of providing wellness related amenities to the people of Hilton as well as the use of collaborative medical care and new technologies. It is significantly noted that the demographic of people that this facility provides for is very much different to the demographic of people at the Durban city centre. High-income individuals and families make up a large percentage of the population of Hilton. With this in mind, human wellness is a universal necessity that is not reserved for any particular group of people therefore the study of this facility is relevant in providing insight to services and spaces as well as design methods required for the culmination of a wellness centre that is inclusive of everyone and integrated with nature.

#### 3.3.2. Connect

The Health and Wellness centre is clearly visible from and is easily accessed off the N3 highway. This location makes the facility extremely convenient to people with private vehicles but is not easily accessible to public transport and definitely not pedestrians, which is somewhat appropriate for the local populace. The facility is quite private and not welcoming to the greater public, it is gated and the main

entrance is not visible from the access road. The building has a connection to the adjacent hospital where even the modern contemporary architectural language is shared, there are however, missed opportunities for further integration for example, a connecting pedestrian bridge.

The predicted trend is that there will be a movement of the city centre from Pietermaritzburg, north toward Hilton (voightsgroup.co.za, 2016), where there is an array of private schools, a favourable climate and a family oriented lifestyle (voightsgroup.co.za, 2016). The development of this facility is a response to that predicted decentralisation of the CBD and the future commercial and residential node of Hilton, not necessarily the current one, which brings about disconnect between the existing community and the health and wellness centre. The centre itself is not fully connected with the user as access to the main entrance requires a drive around the entire building and there is no reception area to greet the user upon arrival.

### 3.3.3. Captivate

The concept for the health and wellness centre was to create a facility that focused on patient-centred care with a holistic approach, focusing on wellness (hiltonhealth.net, 2017). It was designed such that the architecture and features of the building, captured and reflected the branding and identity of the client (voightsgroup.co.za, 2016). The building's use of materials and orientation was intended to allow an environmental response to the sub tropical climate of Hilton

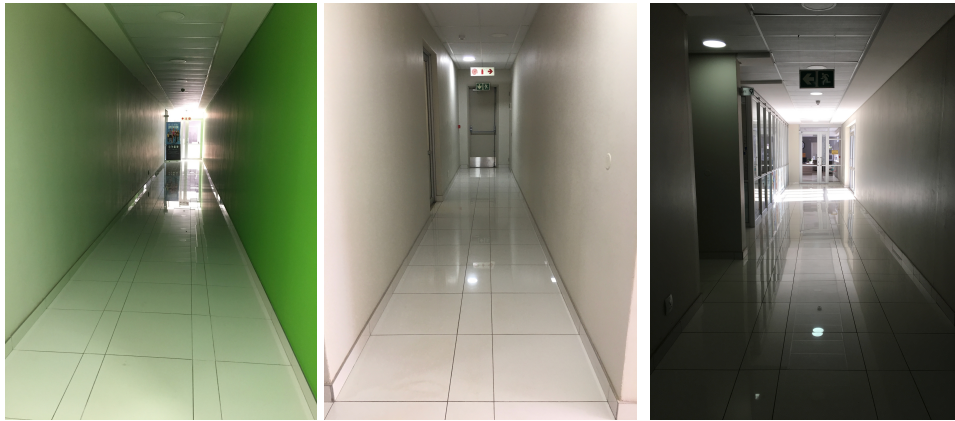
(voightsgroup.co.za, 2016). The orientation however, falls short of the desired outcome, upon visiting the building there is a clear lack of natural light which gives a shadowed and cold impression to the user. Masonry walls used in construction, provide effective thermal mass properties which helps to regulate the internal temperature (voightsgroup.co.za, 2016). This feature is however nullified, as there is no natural ventilation, all of the exterior doors to the building are closed with a full-time mechanical ventilation system in use.



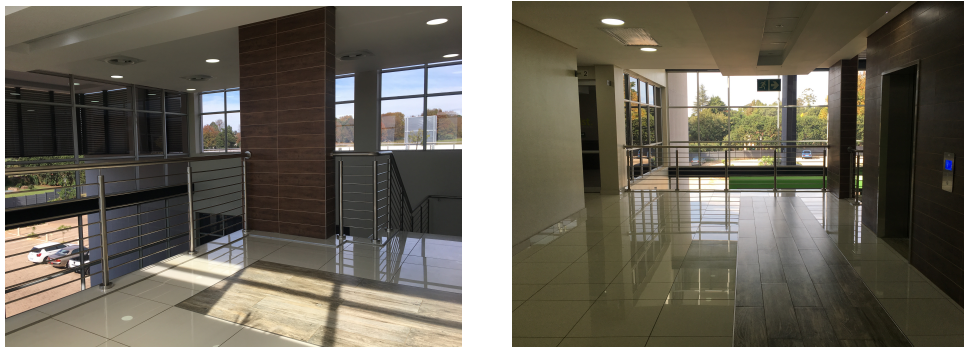
**Fig. 3.7. South-east facing main entrance** (Source: Author, 2017)

In terms of biophilic design principles and integration with nature, the facility has a few roof gardens that are well maintained but not visible or open to the main circulation spaces. The centre's location in the Kwazulu Natal Midlands offers a natural landscape that is tranquil, idyllic and well preserved, and would have been an opportunity for the building and the user to have a strong connection to nature, in terms of wellness and healing, there is however no interaction with the landscape, not even views or vistas of the scenery. The interior palette of the

building is neutral greys with quirky intervals of bright colours that help to make the space more humanised and less clinical. The building lacks any natural finishes and that further emphasizes the cold impression of the space. There are long internalised corridors on every level that may cause stress and discomfort instead of wellness.



**Fig. 3.8., Fig. 3.9. & Fig. 3.10. Internalised corridors of the building** (Source: Author, 2017)



**Fig. 3.11. & Fig 3.12. Views from the main lobby** (Source: Author, 2017)

### 3.3.4. Create

The client and architect's vision was to create a holistic, multi-disciplinary health hub and gave careful consideration to the prospective service providers and tenants in order to maintain a balanced integration of various disciplines (hiltonhealth.net, 2017). This included a scope of medical suites such as, physiotherapy, audiology, dentistry, optometry and oncology as well as lifestyle and wellness programs such as a sports laboratory with a gym intended for public and for rehabilitation use, nutritionist, pharmacy, coffee shop and attorneys. These programmatic functions of the building rather than the architecture highlight a sense of human wellness. The building is designed such that the circulation routes does not promote way finding, capture interest or enhance the experience of the user. There is also a distinct absence of cultural attachment, which invalidates creating a sense of place in the community.

## 3.4. Conclusion

The two case studies discussed in this chapter are quite different in the sense of location, the communities they cater to, the accessibility as well as the approach to the architectural design. The Umkhumbane Community Health Centre showed how a building can successfully integrate the existing community and directly assists with their needs. It incorporated principles of biophilic design and genius loci, which subsequently promoted a degree of wellness throughout the building. The facility

did however lack programs directly related to human wellness such as a community gym, hair and beauty spaces and nutrition experts, which are facilities that the Hilton Health and Wellness Centre provided. The absence of community links and presence within the building at Hilton hinders the creation of a sense of place and the missed opportunity of integrating the natural landscape of the midlands show that the building has no focus on principles of biophilic design or genius loci.

A successfully designed wellness centre in Durban would require qualities found in both of these case studies. It can be observed that the natural environment is necessary in architecture in order to create a warm welcoming atmosphere that promotes human wellness rather than stress and discomfort. Architecture needs to promote lifestyles of people that maintain modernity and are current but also allow for the interaction with the natural environment as a refuge. It is noted that buildings themselves may not cure disease or illness, however they have the potential to improve overall health and wellbeing, which is extremely important and relevant, especially in the city context.

## **Chapter Four**

Presentation of Data and Analysis

## 4.1. Introduction

This chapter serves to assess and summate all of the literature and data acquired within the context of the theoretical framework that has been outlined thus far.

Due to the topic of research being focused mainly around the user experience of the built and natural environments, numerous semi-structured interviews were conducted. This was done in order to gain an understanding and make discoveries through the first hand experiences and expertise of various wellness and healthcare practitioners and service providers. In addition, the two case studies discussed in the previous chapter were critically observed and analysed according to the theoretical framework, by means of an observation schedule.

The data collected has been analysed according to the themes of connect, captivate and create, which incorporates the ideas and principles of the theories discussed in the literature review, that of human wellness, biophilia and genius loci. In light of this, only the relevant themes that have emerged from the interviews will be discussed.

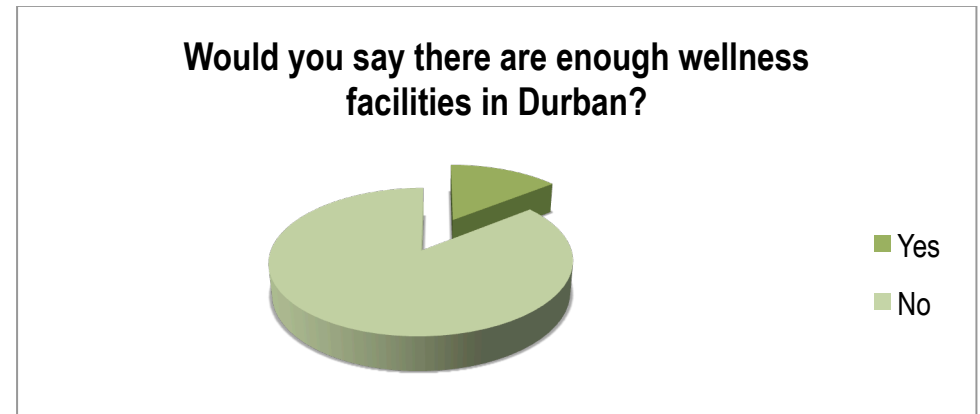
## 4.2. Analysis of Results

The individuals selected to participate in the interviews are affiliated to wellness and healthcare through their professional occupation or qualification. A total of ten

interviews were conducted and the findings proved to be useful to the study in the following ways.

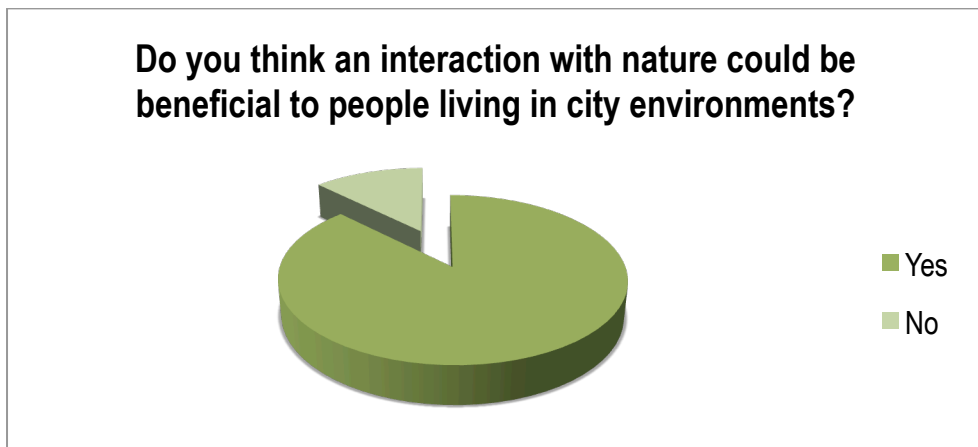
### 4.2.1. Connect

This theme deals with connectivity and accessibility, connectivity between people and nature, people and the built environment as well as nature and the built environment. It also includes accessibility in terms of the social equality of wellness facilities. When asked if there are enough wellness centres in Durban, the majority of the interviewees, 85,7% thought that wellness facilities in Durban were underprovided, especially in the city centre.



**Fig. 4.1.** Shows percentage of interviewees who feel there are insufficient wellness facilities in Durban. (Source: Author, 2017)

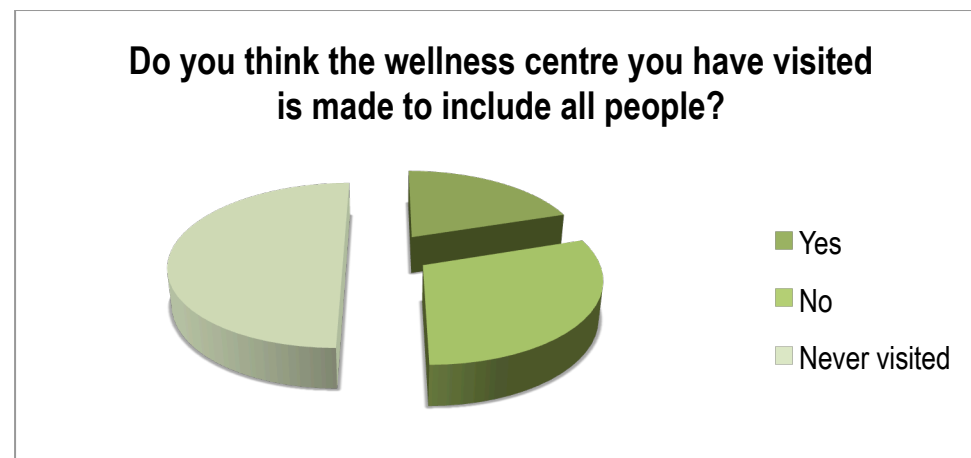
On the topic of nature and its healing aspects, all of the participants felt that a connection to nature enhanced healing and contributed to a feeling of calmness and tranquillity. When asked about nature in the urban environment, most of the responses were positive, with 87,5% thinking that an interaction with nature would be beneficial to people in the city.



**Fig. 4.2.** Shows percentage of interviewees who feel positively about interactions with nature in the city. (Source: Author, 2017)

One of the professionals said that, “The concrete jungle does not offer the physical mental emotional spiritual stimulation that interactions with the natural world provides.” another response was, “Being around nature gives one a sense of peace and relaxation, which in turn increases one’s ability to de-stress and cope better with situations in life.”

When asked about the social accessibility of existing wellness centres, the responses were varied where some participants were of the opinion that wellness centres they have visited felt welcoming to all people including the lower income population group. Other interviewees expressed that facilities they have visited had a feeling of exclusivity and catered to a small margin of the population, while some have never visited a wellness centre before. One of the responses was, “The rich generally migrate out of town to spas and wellness centres while the poor simply cannot afford the journey or the treatments.” Many of the participants have never been to wellness centres mostly because of the inconvenience as well as the lack of exposure to the numerous benefits of improving one’s quality of life by satisfying more complex needs as well as the basic needs.



**Fig. 4.3.** Chart showing how interviewees felt about the accessibility of wellness centres. (Source: Author, 2017)

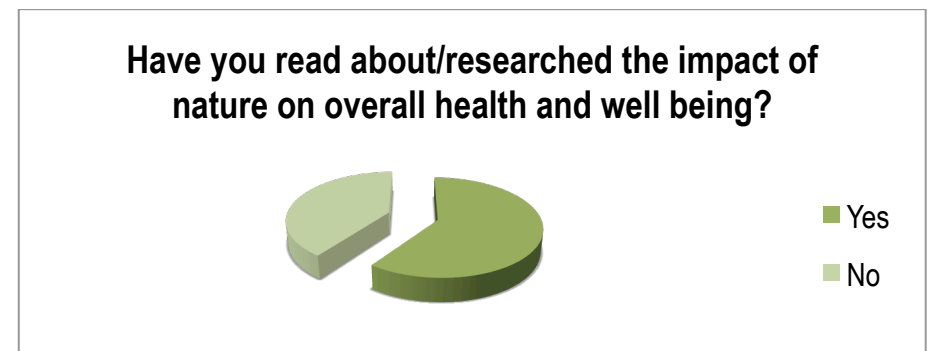
#### 4.2.2. Captivate

The theme of captivate is linked with biophilic design principles and human wellness. It deals with the effects that nature may have on human wellness such as providing a calming and healing environment, as well as captivating the interest of people by stimulating the senses. When asked about the understanding of the concept of human wellness, the responses from people interviewed had many ideas in common. For example, one respondent said, *“Wellness for humans is a holistic concept that requires a balance between various life elements in striving for happiness and success. The life elements include family, career, finances, spirituality, community, creativity, mind health and body health balance are all important for human wellness.”* While another said, *“A necessary factor for optimal functioning comprising various elements including a well balanced life, health, happiness, effective relationships etc.”* Here we can see that the idea of balance is shared as well as the many facets of achieving good health. When asked if human wellness was important, all participants had agreed that it is of importance to promote and maintain one’s health and overall wellbeing.

While many of the participants have never read about or researched formally the effects of nature on wellbeing, the main consensus was that it provides a sense of calm, improves all aspects of health and is even a source for creativity. From those who have delved into this topic, the responses were similar with one interviewee saying, *“Nature serves as inspiration in arts, writing, etc. (creativity). It also helps*

*with spiritual connectivity. People feel closer to God when in Nature. It also provides for adventure and activity (body) Nature is therefore important for holistic wellness required for people.”* This sort of response is akin with the literature reviewed in the previous chapters, it shows that people do experience wellness and healing through nature.

The literature discussed in the review, talked about wellness including a sense of belonging, to a community or place and when that feeling is achieved it gives one a sense of fulfilment. However, one of the interviewees has expressed that a disconnect from people is necessary for achieving a sense of calm and peace, *“I have done a fair amount of hiking in the upper and lower Drakensberg Mountains, and I always find that, beyond the physiological benefits of physical activity, my mind is always calmer and more focused after a weekend in the mountains, away from technology and society.”*



**Fig. 4.4.** Shows percentage of participants who have background knowledge of the relationship between wellness and nature. (Source: Author, 2017)

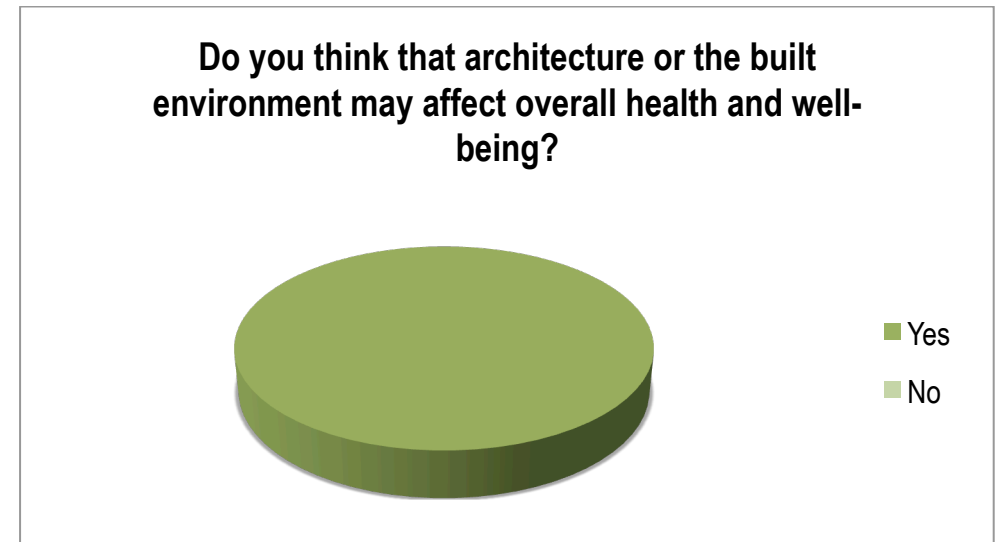
### 4.2.3. Create

The theme of create deals with the theory of genius loci such as creating a sense of place, and emphasizing and enhancing the site and its context. The majority of the participants felt that their urban environment did not enhance or even permit wellbeing instead it induced stress and created a polluted environment. There were a few who had felt the opposite, that their city environment was a restorative place that would create a sense wellbeing as well as a strong sense of place, one response was, *“Pietermaritzburg/Howick. I have grown up in this area and therefore, although it is sometimes dirty and has its own faults, driving in to or flying over Pietermaritzburg on the return from a long journey away always produces a sense of nostalgia due to the lush greenery in the KZN midlands.”*



**Fig. 4.5.** Shows percentage of participants who feel that their city environment is not conducive to wellness. (Source: Author, 2017)

When asked their opinion of whether the built environment may affect overall health and wellbeing, the participants all agreed that it had a significant impact. One response explained that, *“The built up environment is where most people spend most if not all of their time so it plays an important role in people’s lives and quality of living.”*



**Fig. 4.6.** Shows consensus of participants who feel that the built environment impacts wellness. (Source: Author, 2017)

### 4.3. Conclusion

The analysis of the data collected has shown that people are aware of the importance of wellness and that there is an absence of wellness education and

facilities in the city of Durban. There is also an acknowledgement of the strong connection between people and nature and that experiencing this connection is imperative for achieving holistic wellness.

From the literature, precedents and case studies reviewed, it can be concluded that designing a built environment that will permit and promote wellness will increase quality and efficiency in all aspects of life. At this point in society's development, people spend most of their lives in built up environments so practising architecture that is considerate to the needs of people can have a significantly positive impact.

The shortage of places and facilities that are designed for wellness or an interaction with nature in the Durban city centre, is a result of a perception of wellness that has been the standard for many years, that of it being an exclusive luxury, not accessible to everyone. It is noted that mainly due to poverty, many of the city's inhabitants are unable to fulfil basic human needs and completely overlook the more complex ones, this is something that the design intervention will need to address.

The data has also shown the inherent inclination people have toward the natural environment. The lack of trees, public green spaces and the connection between people and nature in the city of Durban creates a negative impact on the overall health and wellbeing of the city's inhabitants. The literature indicates a solution to this disconnect from the natural environment, biophilic design principles is an

effective way of creating a restorative environment that can facilitate a connection to nature that will be beneficial to users and have a positive impact.

## **Chapter Five**

### Conclusions and Recommendations

## 5.1. Introduction

Based on the analysis of the literature, precedent and case studies as well as the primary research data, it is clear that the effect of the integration of biophilia and the built environment on human wellness is substantial and positive. This chapter is a culmination of all theories, concepts and findings in this study and will result in a set of guidelines toward designing a wellness centre that will permit and promote wellness through architecture and nature. The guidelines will be outlined according to the three main themes of *connect*, *captivate* and *create* as well as deal with the criterion for selecting a suitable building site. The chapter includes an informed discussion of the research questions based on the research conducted.

## 5.2. Conclusions

In accordance with the objectives of the research proposal that was set up at the commencement of the study as well as the research questions, the following conclusions are made.

**Aim:** to explore how the influence of biophilia improves architectural design and subsequently enhances overall health and wellbeing.

### Objectives:

#### 1. To determine if a spatial connection to the natural environment is beneficial to healing

The research analysed in this study has shown that a connection between the built environment and the natural environment is beneficial to the wellbeing of the user. The relationship that has been cultivated between the user and nature through the built environment has been proved to fulfil many human needs that are required for a full spectrum of wellness thus achieving a healing environment.

#### 2. To analyse the current use of nature in wellness centres

The two case studies that were examined have both shown a slight connection to nature in light of biophilic design. There were minimal attempts made at creating this connection and using the natural environment as a tool for healing. The use of gardens was the extent of the implementation and did make a slight difference to improve the feeling of wellness.

#### 3. To explore how nature may affect overall health and well being

As discussed in previous chapters, a spatial and visual connection to nature does have a positive effect on overall health and wellbeing showing that aspects of the natural environment can be a valuable means of creating environments conducive to wellness.

#### **4. To explore how the natural environment can be optimally integrated in the design of a wellness centre**

The research has shown that a successful method of integrating nature with the built environment is through the practice of biophilic design. The literature has outlined a set of biophilic design principles that will enhance the design of a wellness centre or any building for the user as well as the natural environment.

#### **Research Questions:**

##### **What is the effect of integrating biophilia with the built environment on overall health and wellbeing?**

As human beings, our holistic existence has evolved in a bio-centric world where the natural environment has shaped our existence. This has changed drastically in the past century where the world, specifically the everyday environment of most people, has become human engineered. The inherent need that humans have for contact with the natural environment still exists despite the disconnection experienced in an urban setting. Integrating nature with the built environment through biophilia is an effective method in fulfilling this inherent need. It revitalises the mind and body through numerous stimulating processes that either involves nature directly or simulates nature in the design. Natural light and ventilation, the sound of flowing water and the cooling effect of trees in a courtyard are some of the biophilic design features that provide an environment of healing and calmness. The

effect of the integration of biophilia and the built environment on overall health and wellbeing is an immense improvement in holistic wellness of all people.

##### **What is the optimum environment for human wellness?**

Deeper than human being's affiliation toward nature, there is evidence showing that natural elements such as plants and water have a real contribution to human wellness through restoration (Kellert and Calabrese, 2015). The optimum environment for human wellness includes access to the natural environment, which provides a calming tranquil experience conducive to healing. The optimum environment for wellness would also have elements of nature simulated throughout the design of the space, by use of shapes, forms, colours and textures that would stimulate the senses and provide rejuvenation. A familiarity or sense of place for the user also contributes to an environment of wellness

##### **What is the relationship between the natural environment and human wellness?**

Biologically, humans require nature for existence, for example, natural light is needed for the development of the skin and eyes (Salingaros, 2015). The natural environment is also required by humans on a psychological level, for example, water is essential for human survival and so there is a cognitive attraction to it, the sound, the sight and the feel of it provides a satisfactory feeling of wellness. The sensory organs and systems in humans respond beneficially to the natural geometry that is found in nature such as colours, fractals, scale and complex symmetries (Salingaros, 2015). The relationship between the natural environment

and wellness is definitely a positive one that has countless benefits for the wellbeing of people.

### **How can aspects of the natural environment be integrated with the built environment through biophilia?**

The principles of biophilic design have been described extensively in this paper.

The following is a summarized list of the guidelines for biophilic design:

- Light
- Colours
- Gravity
- Fractals
- Curves
- Detail
- Water
- Life
- Transitional Spaces indoor/outdoor
- Mobility and wayfinding
- Prospect and Refuge

In conclusion, the proposed wellness centre would need to **connect** people to nature, **captivate** their interest with invigorating design solutions and **create** a place of wellness that is for all.

### 5.3. Guidelines for wellness in architecture

- **Fulfilling Human Needs**

In order to achieve a full spectrum of human wellness, the basic as well as complex needs of people need to be fulfilled. This is outlined in Maslow’s Hierarchy of Needs diagram (Maslow, 1959) where the range of needs start from basic physiological levels, to the more complex social levels. Social and physical accessibility is an important aspect raised in this study, where the proposed wellness centre would need to be welcoming to all people regardless of their socio-economic status. A way in which to maximise this open-hearted building concept is to provide some of the basic needs for people through architecture, as shown in the following table:

Basic Need from Maslow’s Pyramid	Who is it for?	Type of Space Required
<b>Physiological Needs:</b>		
Food/Water	Commuters Residents	- Affordable food outlets - Informal spaces and seating
Rest	Workers Students	Places to sit - sheltered - in a garden or near water feature
Physical Activity	Unwell Residents Differently-abled	Place to train physically - Semi formal gym space - Meandering walkways - “Play Area” trampolines etc.
<b>Safety Needs:</b>		
Protection from dangerous situations	All people, specifically: Families Women Students	- Maximise surveillance in and around the site - Avoid narrow corridors - Avoid corners in the building that limit visibility
Protection from the weather	All people, specifically: Informal Traders Commuters	- Shops/booths that are open to the street but still able to protect from the elements - Sheltered walkways through the building and courtyards
<b>Love and Belongingness:</b>		
Being part of a group/community	All people, specifically: Differently-abled Unwell Nightlife	- All parts of the building to be accessible, ramps, lifts, wide walkways and doors etc. - Social spaces where people can interact, courtyards, transitions spaces, eating areas, gardens etc.

**Table 5.1. Table showing ways to fulfil basic needs of people in the city, through architecture** (Source: Author, 2017)

- **Optimum Internal Environment**

The research has shown that the physical environment within a building has a significant impact on human wellness as a major percentage of our lives are spent indoors.

Optimum Air Quality

Thermal Comfort

Natural Light

Natural Ventilation

- **Connecting to Nature**

As it can be seen from the conducted research, nature can be an influential tool in creating places for wellness, due to human's inherent need to connect with nature, it promotes good overall health and wellbeing. The following concepts from The Restorative Benefits of Nature by Kaplan (Kaplan, 1995) show how nature enhances wellness:

- **Being away** – Restorative experience of a natural landscape which can also be achieved in an urban setting.
- **Fascination** – Fascinating features and phenomenon that hold the attention of many people.
- **Extent** – A sense of extent can easily be experienced in a natural landscape but can also be possible in a small area.
- **Compatibility** – The natural environment and human inclinations are highly compatible which makes it easier to function in a natural environment rather than a structured one.

### 5.3. Guidelines for biophilic architecture

- **Direct experience of nature**

This is the actual contact with natural environmental features within the built environment.



- **Air**
- **Light**
- **Water**
- **Plants**
- **Weather**

**Fig. 5.1.** Shows direct contact with nature within the built environment (Source: Harsha, 2008)

- **Indirect experience of nature**

This is contact with images or things representational of nature for example natural materials. It is an implied connection.



**Fig. 5.2.** Shows indirect contact with nature through the use of natural form and materials. (Source: [www.norwegianamerican.com](http://www.norwegianamerican.com), 2015)

- **Curves**
- **Natural Colours**
- **Natural Light**
- **Natural Materials**

- **Experience of Space and Place**

These are spatial features that are distinctive of the natural environment, for example exploration and discovery through prospect and refuge and way finding.



**Fig. 5.3.** Shows experience of wayfinding. Change in colour highlights flow of movement (Source: [Queener, 2017](#))

- **Mobility and Wayfinding**
- **Natural Colours**
- **Transitional Spaces**
- **Natural forms**

## 5.4. Guidelines for creating a sense of place

- **Geographic Connection**

This would include enhancing the natural attributes of the site such as the landscape and optimising the north-south orientation as well as linkages to the street edges and corners. This aspect would also include the use of indigenous materials in the construction of the building.

- **Historic Connection**

This guideline deals with the inherent culture and history of the site. The uniqueness of place is brought about as a result of the past, which should be acknowledged in the architecture. This also looks at the culture of the people, past and present and the diversity that would bring to the design.

- **Social Connection**

In a building of a public nature such as a wellness centre, the community aspect is of great importance. A meaningful connection with the existing community can mean the success of the facility and its longevity.

## 5.5. Guidelines for site selection

The research carried out in this paper has outlined a problem in the way human wellness is perceived in South Africa. There is the perception that it is a luxury reserved only for the high-income portion of society while the rest of the population

have only their basic needs addressed, if at all. The observations of existing wellness centres have shown that they are situated far out of the city centre and do not optimise the use of nature in the design of the buildings nor do they connect with their location in order to create a sense of place. This, along with the design guidelines, has defined a set of criteria for the selection of the site for the proposed wellness centre.

- **Location**

The site should be located within an urban context in order to provide relief from the existing built-up environment that causes inhabitants stress and discomfort. There should be potential for the development to regenerate the urban environment of the site and its context. It should also be a democratic space that is not exclusive to any one particular group of people.

- **Accessibility**

It should be made possible that all people, regardless of socio-economic, cultural or religious backgrounds, can access the site. It should be situated along major public transport routes which would also allow an ease of access for pedestrians. The site should also allow for vehicular access and parking, as well as visibility from main roads.

- **Natural Environment**

The future site should have access to the natural environment both physically and visually, by means of natural daylight, trees, views and vistas. There

should be potential to create outdoor spaces such as gardens and courtyards and potential to link to existing green spaces.

- **Community**

Diversity in people and cultures, which is characteristic of the city, should exist on site and there should be potential for links to the existing community. It should be in close proximity to communal resources and provide enough space for public open spaces where people can interact.

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Research Tools



## COLLEGE OF HUMANITIES: MASTERS RESEARCH INTERVIEW

Using Biophilic Design as a tool for Restorative Architecture, toward a  
Wellness Centre in Durban

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# Interview Questions

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Qualifications: \_\_\_\_\_

1. What is your occupation?

\_\_\_\_\_

2. What is your understanding of human wellness?

\_\_\_\_\_

\_\_\_\_\_

3. Do you think wellness is important?

\_\_\_\_\_

\_\_\_\_\_

4. Do you know of any wellness centres in Durban? \_\_\_\_\_

If yes,

a. Have you visited this facility? If not, why?

\_\_\_\_\_

\_\_\_\_\_

b. Was your experience pleasant?

\_\_\_\_\_

c. Do you think the facility is made to include all people?

\_\_\_\_\_

\_\_\_\_\_

5. Would you say there are enough wellness centres in Durban?

6. Have you read about/researched the impact of nature on overall health and wellbeing? \_\_\_\_\_

a. If yes, please describe your findings.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

7. Do you think that a connection to nature enhances healing and wellness?

\_\_\_\_\_

8. Does your urban/city environment give you a feeling of wellbeing?

\_\_\_\_\_

a. If yes, please list the main contributing factors

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

9. Do you think experiences with nature could be beneficial to people living in city environments? \_\_\_\_\_

a. Why do you think so?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

10. Do you think that architecture or the built environment may affect overall health and wellbeing? \_\_\_\_\_



**COLLEGE OF HUMANITIES: MASTERS RESEARCH OBSERVATION  
SCHEDULE**

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## Case Study Observation Schedule

Design Guidelines		Case Study 1	Case Study 2	Comments
<b>Connect</b>	Is there safe and easy pedestrian access to facility?			
	Is the facility located within a 10 minute walking distance from a bus/taxi/train stop?			
	Is there vehicular access off a main road?			
	Is there sufficient parking?			
	Are there any community/public spaces on site?			
	Are there any spatial links to nearby public open space?			
	Does the building have access to the natural environment?			
	Does the building have any spatial connection to the natural environment?			
<b>Captivate</b>	Is the building oriented on a north/south axis?			
	Does the building receive sufficient natural light?			
	Does the building receive sufficient natural ventilation?			
	Are there any views/vistas of the surrounding landscape?			
	Are there any gardens?			
	Are there any courtyards?			
	Is nature incorporated by means of pot plants/planters?			
	Are there any community farming or food gardens?			

	Are the materials used in construction and finishes natural? eg. wood or stone.			
	Is there any use of natural colours in and around the building?			
	Does the building shape/form resemble any natural geometry?			
<b>Create</b>	Does the building design promote exploration?			
	Does the internal building environment encourage health?			
	Do the internal spaces stimulate creativity?			
	Does the presence of the building feel welcoming?			
	Does the facility incorporate the local community?			
	Is there a design connection to the local culture and people?			





