ARCHITECTURE FOR THE TERMINALLY ILL: A PROPOSED HOSPICE FACILITY DESIGN FOR GHANA

BY

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ABSTRACT

The concept of Hospice care is rooted in the centuries-old idea of offering a place of shelter and rest, or "hospitality" to weary and sick travellers on a long journey. Today, hospice provides humane and compassionate care for the terminally ill so that their last days on this earth may be comfortable. It concentrates on reducing the severity of disease symptoms, rather than providing a cure. The goal is to prevent and relieve suffering and to improve quality of life for people facing serious and complex illness. Ghana lacks hospice facility apart from the hospital units to cater for the dying from terminal diseases such as HIV/AIDS and various types of cancer such as leukaemia, cancer of the colon, liver and lungs etcetera. The objective of the research is to provide a climate and culturally responsive hospice design for Ghana. The research is able to utilize the concepts of courtyards, landscape and congregational open spaces throughout the whole facility, to create a hospice design that that is suitable for Ghana culturally.

DECLARATION

I hereby declare that this submission is my own towards the Master of Architecture and that, to the best of my Knowledge, it contains neither material previously published by another person nor material which has been accepted for the award of any other degree of the University, except where due acknowledgement has been made in the text.

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DEDICATION

This one thing I have learnt...

I have learnt not to doubt myself;

I have learnt not to underestimate my potential;

I have learnt not to know the impossible;

I have learnt to turn to God in all things,

I have learnt to be the best that I can be;

I have learnt what it means to have a family;

Most of all, I have learnt to be me.

This is dedicated to you. You have helped in making me who I am. Your prayers and love have seen me through. Dad, Mum, Ntoriwaa, Sama and Kwantwi.

There is no backbone like you, and I could not ask for a better family than you.

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But for the help of others, this would not have come into fruition. In this respect, it will be honest and accurate to give honour to whom honour is due. To my First Father, your Grace is what has brought me this far. You have been my shield and my buckler, my provider and my guide, my inspiration.

To my supervisor, Dr. Victor K. Quagraine, for your immense contributions, guidance and patience. I am equally grateful to my year and studio masters, Mr S.O Afram and Mr Amoateng-Mensa, the Head of Department, Prof. G.W.K Intsiful, and Mr. Kofi Owusu and all my lecturers who have endowed me with knowledge since I stepped foot on this campus.

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CHAPTER ONE: INTRODUCTION

Special care for the terminally ill, especially those who have a life expectancy of about 6 months is highly required. Family members during these times may not be fully equipped (psychologically and physically) to cater for the patient's needs. Hospice or palliative care is a facility that houses well trained staff such as interdisciplinary health care team of doctors, nurses, social workers, counsellors, home health aides, clergy, therapists, and trained volunteers to offer support based on their particular areas of expertise, (including giving social, emotional, and spiritual support) to the terminally ill. Hospice and Palliative care, takes care not only of the terminally ill but the affected family as well, aiding in pain and symptom control, spiritual care, home care or inpatient care, respite care, family conferences and bereavement care (Hospice and palliative care development in Africa, 2009).

The World Health Organization (WHO) defines Palliative Care as "an approach that improves the quality of life of patients and their families facing the problem associated with life-threatening illness, through the prevention and relief of suffering by means of early identification and impeccable assessment and treatment of pain and other problems which could be physical, psychosocial and spiritual. Hospice Care is designed to give supportive care to people in the final phase of a terminal illness and focus on comfort and quality of life, rather than cure. The goal is to enable patients to be comfortable and free of pain, so that they live each day as fully as possible. Aggressive methods of pain control may be used. Hospice programs generally are home-based, but they sometimes provide services away from home: in freestanding facilities, in nursing homes, or within hospitals. The philosophy of hospice is to provide support for the patient's emotional, social, and spiritual needs as well as medical symptoms as part of treating the whole person (Medicinenet 2003).

Hospice development in Africa dates back to the late 1970's, when hospice services first appeared in Zimbabwe and in South Africa. The first hospice care facility was Island hospice founded in Harare in May 1979. After the hospice development in these two countries, it took a decade before it began to spread into other countries in Africa: It was in Kenya and Swaziland in 1990, Botswana, Tanzania and Zambia in 1992, Uganda in 1993, Sierra Leone in 1994, Morocco in 1995, Congo-Brazzaville and Nigeria in 1996, Malawi in 1997, Egypt in 2001, and the Gambia in 2004. There are a total of 136 Hospice and Palliative care organisations in 15 countries in Africa. Ghana does not have a hospice facility yet. In 11

African countries of which Ghana is one, steps are now being taken to create the organisational workforce and the policy capacity for hospice care. A conducive design of an effective hospice facility in Ghana is necessary for this reason.

This research has taken the lead to propose a climate and cultural responsive hospice design for Ghana. (Hospice and palliative care development in Africa, 2009).

Ghana encompasses an estimated population of 22,019,000. Ghana is situated in the West African sub- region. It has climatic conditions of the tropics; warm and comparatively dry along southeast coast; hot and humid in southwest; hot and dry in north (World Fact book, 2009). Therefore there is the need to design a building which will be suitable for this climate rather than to copy a design from the temperate regions where people spend 90% of their time indoors (Simpletek 2000) as compared to that of the developing countries where people spend about 54% of their lives in indoor spaces including homes, schools, offices and vehicles WHO, 1997)

1.1 PROBLEM STATEMENT

Research has proved that the top 10 causes of death in Ghana include chronic diseases such as HIV, cancer, and complications of diabetes. (Ghana Health Service 2006) These illnesses usually results in terminal illness. Table 1 shows that HIV/aids have steadily increased over the years, indicating that the need for a hospice to serve people suffering terminal diseases is very vital.

Table 1: Disease trend – Chronically ill patients of selected diseases. (Ghana Health Service 2006)

	2004	2005	2006	2007
HIV new cases	2263	4405	5235	5430
Diabetes OPD	9802	11650	12666	23,567
admitted	978	1081	2617	
Hypertension	38650	2588	54,582	10701
OPD admitted	2442		2617	1810

People who are confirmed as terminally ill in Ghana are usually discharged to go home because of lack of hospice facilities to help facilitate dignified death. A culturally accepted alternative to hospice care in Ghana is the home based care, where the patient stays with

relatives and health personnel come to visit them. The limitation to this is type of care is the lack of knowledgeable committed caretakers who will take care of the sick relative. In the past the extended family system employs children out of school as caretakers. However, in recent times, due to the policy of Free Compulsory Universal Basic Education, and the international Child Labour Law, the children are not available for the full time jobs, not even for their sick relatives. This coupled with the gradual shift from extended family system to nuclear ones as a result of urbanization has caused the terminally ill patients to receive the worst of care, hence quickening their death in agony.

The need for a hospice in recent times, has become obvious as hospital beds come in high demand because of cost in establishing more hospitals and training more staff. (Ghana Health Service 2006) The increase demands of hospital beds result from the increase in access to hospitals as a result of the National Health Insurance Scheme which makes it free for children under 18 years and the elderly above 70 years (MOH, Ghana,2003).

1.2 OBJECTIVES

The main objective of this study will be as follows;

To design a climate and culturally responsive hospice design model for Ghana. The design intends to:

a. To create a warm, comfortable, home-like environment to serve as a prototype for other hospice designs in Ghana.
b. To create energy efficient buildings that are best suited for a facility such as a hospice.

1.3 SCOPE OF STUDY

The area of study for this dissertation includes creating a hospice facility which is suitable for a tropical climate, especially Ghana to cater for the physiological, psychological and cultural needs of its users.

1.4 RESEARCH METHODOLOGY

The research methods used in this study were; Interviews, literature reviews, photography, measured drawings, personal observations, and case studies.

1.5 JUSTIFICATION

Hospices facilitates plays an important role in filling the vacuum for good and quality end of life care and gives dignity to the terminally ill patient who was once a productive member of the community. With a majority of hospices located in the temperate regions of which 3,150 hospice services is in the united states alone, there is the need for a design that would suit the tropical regions of which Ghana is a part. There are 136 hospice and palliative care organisations in Africa, and not one is situated in Ghana. The proposed facility will improve the health sector of the country.

1.6 LIMITATION

This research does not delve deep into the aspect of cost implication in relation to the design, construction and operation of the facility. I recommend that future research should concentrate on this area.

1.7 CONTRIBUTION

The design has created a personal haven for the terminally ill. It employed courtyards, landscape and accessible open spaces conducive to the culture and climate of Ghana as seen in the appendix five. The proposed hospice design should be considered the model of hospice facilities in Ghana since aside the cultural and climatic considerations, it also responds to the universal standards of hospice design and construction.

CHAPTER TWO: LITERATURE REVIEW

As a background to the formulation and validation of the hospice design favourable to the tropical climate, the research reviews literature on Ghana's demographics, climate, culture and hospice care. This research also reviews literature on hospice inpatient facility design and construction. Literature on Feng Shui is reviewed to help understand other cultures design philosophy pertaining to health. Healing gardens, hospice gardens, water and health, parking standards for residential institutions and foreign case studies were also researched into.

2.1 DERMOGRAPHICS OF GHANA

Formed from the merger of the British colony of the Gold Coast and the Togoland trust territory, Ghana in 1957 became the first sub-Saharan country in colonial Africa to gain its independence. Ghana is located in West Africa, bordered by the Gulf of Guinea, Cote d'Ivoire and Togo and has the Geographic coordinates of 8 00 N, 2 00 W (World Fact book, 2009). Ghana has an area of 238,533 sq km. It experiences tropical climatic conditions; warm and comparatively dry along southeast coast; hot and humid in southwest; hot and dry in north. Average temperatures are usually between 20.5ºC and 26ºC. The annual rainfall in the coastal zone averages 830mm (33in.) and decreases towards the northern part of the country. Ghana's plants range from ancient trees in remote forests, to lush mangroves and beautiful flowering plants. The major vegetations in the country include secondary rain forest, coastal bush and grass land and the wooded savannah in the north (United State Department of State (USDS) 2005).Trees include giant silk cotton, African mahogany, cedar, odum, ebony, shea, acacias and baobabs, while flowering plants include flame tree, roses, bougainvillea, lilies, orchids, blooming cacti and hibiscus. Crop plants include oil palms, cotton, rubber, sugar cane, tobacco, and kenaf. There are also fruit trees such as banana and papaya. Southern Ghana is covered by evergreen and semi deciduous forests, with tall silk cottons, kolas and hardwoods such as mahogany, odum, and ebony. The northern part of the country is covered by savanna, with shea trees, acacias, and baobabs. The oil palm is found across the southern areas and the Ashanti uplands, and the lagoons near the coast are filled with mangroves. There are also sacred forest areas across the country, which are used for

religious celebrations and festivals, and are often protected and preserved (Overlandingafrica, 2009).

The topography of Ghana consists mostly of low plains with dissected plateau in south-central area. The Eastern region of Ghana has Undulating topography and has a semi-deciduous forest for vegetation (World Fact book, 2009).

Ghana has a population of 22,019,000 and a population growth rate of 1.897% (World Fact book, 2009).Ghana has an Age structure of 0-14 years being 37.2% (male 4,494,633/female 4,394,074), 15-64 years being, 59.2% (male 7,065,273/female 7,086,023) and 65 years and over being 3.5% (male 389,886/female 457,923) The death rate of the country is 9.13 deaths per a 1, 000 population whilst infant mortality rate is a total of 51.18 deaths per 1,000 live births. HIV/AIDS is prevalent in adults with 260,000 people living with it at the growth rate of 1.9% (World Fact book, 2009).

2.2. HOSPICE CARE

Hospice is a system which provides care to terminally ill patients at the end of their lives and also supports their families in the bereavement process. It includes comprehensive nursing care as well as psychosocial and spiritual care for the patient and family. Hospice is built on the nursing model which concentrates on care and comfort until death, in contrast to the medical model of care, which is based on cure. Hospice is not about heroic medical interventions that prevent quality of life in a pointless attempt to prolong it (Passionate care, 2006).

2.2.1 THE HISTORY OF HOSPICE AND PALLIATIVE CARE

The concept of Hospice care is rooted in the centuries-old idea of offering a place of shelter and rest, or "hospitality" to weary and sick travellers on a long journey. The modern human hospice movement began in the early 1970's as an alternative for terminally ill patients dying in hospital intensive care undergoing heroic but hopeless treatment. Hospice care for terminally ill patients usually begins when life expectancy is less than 6 months. Approximately 50-70% of hospice patients have cancer (Passionate care, 2006).

The focus of care is on sustaining the highest quality of life for whatever time remains. The majority of patients remain at home with family, pets and familiar surroundings instead of

being hospitalized. Hospice care encompasses the family and patient, unlike traditional medicine which focuses on the patient and the disease in isolation from considerations about family and friends. Hospice services provided to family members include psychosocial counselling, spiritual counselling, respite care to give primary caregivers time to rest and recharge, and bereavement counselling and support groups for survivors after the patient's death. (Passionate care, 2006)

Hospice care is provided by a multi-disciplinary team, not a single professional. A team may include nurses, psychosocial counselors, home health aides, a medical director, a chaplain, and volunteers. Each member of the team is called in as needed and patient assistance is available 24 hours per day. Coordination and communication among the team members is a vital operational requirement. (MedicineNet, 2003)

2.2.2 SETTINGS FOR HOSPICE CARE

Although most patients receive hospice care at home, hospice care can also take place in other settings, including the Hospital-Based Hospice. This is where the hospitals have a hospice program that gives terminally ill patients access to support services and other health care professionals. Some hospitals even have a special hospice unit. There is also the Long-term Care Hospice, where nursing homes and long-term care homes provide hospice units with specially trained staff for those patients who do not have a primary caregiver at home, or who require medical services not suitable for a home setting. Lastly is the Freestanding Hospices which is independently owned hospices and may sometimes include an inpatient care facility, in addition to their home care hospice services. This research concentrates on the freestanding hospice facility (Passionate care, 2006).

2.2.3 HOSPICE INPATIENT FACILITIES DESIGN AND CONSTRUCTION.

Stated below are the design requirements for the design and construction of a hospice facility, as of effect on March 1, 2010.

2.2.3.1 ADMINISTRATIVE AREAS.

It is recommended that large hospice inpatient facilities should have an administrative office of sufficient size to store records, equipment and staff belongings. Finally, the

provision of a public reception or information area for a large hospice inpatient facility is needed (Hospice Inpatient Facility Construction 2010).

2.2.3.2 RESIDENT ROOMS.

According to Hospice Inpatient Facility Construction (2010), all public, common, and at least 10 percent of resident toilet rooms and bathrooms should have fixtures that comply with Disabilities Act Accessibility Guidelines of the building code. These rooms are designed to be wheelchair accessible with wheelchair turning space within the rooms (Hospice Inpatient Facility Construction 2010).

Resident rooms are the spaces which will be inhabited by the terminally ill patients. Maximum room occupancy is two residents. Minimum room areas (exclusive of toilets, closets, lockers, wardrobes, alcoves or vestibules) must be 120 square feet in single bed rooms and 100 square feet per bed in multiple-bed room. Existing buildings or spaces being licensed as a hospice shall have a minimum of 80 square feet of clear floor area per bed in multiple-bed areas and 100 square feet of clear floor area in single-bed rooms. In multiple-bed rooms, clearance shall allow for the movement of beds and equipment without disturbing residents. The dimensions and arrangement of rooms shall be such that there is a minimum of three feet clearance at least at one side, the foot, and between another beds. This rule of thumb will be adhered to in this design to enable movement of wheel chairs and gurneys around the patient beds (Hospice Inpatient Facility Construction 2010).

It is recommended that a nurse call system be provided for each bed. Two call devices serving adjacent beds may be connected to one calling station. Calls in a large inpatient hospice facility shall also activate a visible signal in the corridor at the resident's door (Hospice Inpatient Facility Construction 2010).

A nurse emergency call device is required at each inpatient toilet, bath, and shower room. The call device may be accessible to a collapsed resident lying on the floor. Inclusion of a pull cord will satisfy this standard. The emergency call system may be designed so that a signal activated at a resident's calling station will initiate a visible and audible signal distinct from the regular nurse call system and can be turned off only at the resident calling station.

Each resident will be provided with access to a toilet room without having to enter the corridor area. One toilet room will serve not more than four beds and no more than two resident rooms. The toilet room door has to swing outward. At least one single-bed room with a private toilet room containing a toilet, lavatory, and bathing facility must be provided for each eight beds, or fraction thereof, in a hospice facility (Hospice Inpatient Facility Construction 2010).

Each resident room is intended for 24-hour occupancy. Thus it must have an operable window open to the building exterior or to a court which is open to the sky (Hospice Inpatient Facility Construction 2010).

Visual privacy shall be provided for each resident in multiple-bed rooms. Design for privacy shall not restrict resident access to the toilet, lavatory, or room entrance. Resident bathing facilities shall be provided in each hospice unit at a ratio of one bathing facility for each eight beds, or fraction thereof, not otherwise served by bathing facilities within individual resident rooms. Each resident bathtub or shower shall be in a separate room or enclosure large enough to ensure privacy and to allow staff to assist with bathing, drying, and dressing (Hospice Inpatient Facility Construction 2010).

2.2.3.3 RESIDENT SUPPORT AREAS.

Resident living areas may be equipped with tables, reading lamps, and comfortable chairs designed to be usable by all residents. The total area set aside for dining, resident lounges, and recreation area shall be at least 35 square feet per bed with a minimum total area of at least 225 square feet. At least 20 square feet per bed shall be available for dining (Hospice Inpatient Facility Construction 2010).

The general purpose room must be designed with a minimum area of 100 square feet. It must accommodate family gatherings and be equipped with a table, comfortable chairs and incandescent lighting. In small hospice inpatient facilities, this room may be omitted if the required living area includes an enclosed lounge. A minimum area of ten square feet per bed must be provided for outdoor recreation. This space will be provided in addition to the setbacks on street frontages required by local zoning ordinances (Hospice Inpatient Facility Construction 2010).

2.2.3.4 SERVICE REQUIREMENTS FOR NURSES STATIONS

A nurse station should have space for charting, storage, medication, security, and administrative activities. Toilet room(s) with hand washing facilities for staff may be unisex (Hospice Inpatient Facility Construction 2010). Hand washing facilities should be located immediately adjacent to the nursing station and the drug distribution station (Hospice Inpatient Facility Construction 2010).

Provisions should be made for 24-hour distribution of medications by providing a medicine preparation room or a self-contained medicine dispensing unit. If a medical cart is used it shall be under visual control of staff (Hospice Inpatient Facility Construction 2010).

2.2.3.5 DETAILS AND FINISHES FOR HOSPICE FACILITIES

Corridor handrails must be provided for support of patients who cannot walk; Cubicle curtains and draperies must be affixed to permanently mounted tracks or rods. Portable curtains or visual barriers are not permitted. There should be the provision of general and circulation direction signs in corridors, identification at each door and emergency directional signs. All partitions and all floor and ceiling construction in resident areas must be sound proof (Hospice Inpatient Facility Construction 2010).

It is recommended that floor materials be easily cleanable and floors in areas used for food preparation or food assembly, be water-resistant and resistant to food acids. In areas subject to frequent wet-cleaning, the floor materials must be sealed to prevent contamination by germicidal cleaning solutions. Floors and wall bases of kitchens, toilet rooms, bath rooms, and housekeeping rooms must be homogeneous or joints, tightly sealed. Wall finishes have to be washable, smooth and moisture-resistant. Finish, trim, floor, and wall construction in food preparation areas shall be free of insect and rodent harboring spaces. Floor and wall openings for pipes, ducts, conduits, and joints of structural elements must be tightly sealed to prevent entry of pests. Carpet and padding have to be stretched taut and be free of loose edges (Hospice Inpatient Facility Construction 2010). In the design of the proposed hospice facility, I decided to use uncut terrazzo flooring and unpolished ceramic tiles for the floor finish for the wet and circulation areas, and carpets for the resident bedrooms and living areas

Finishes of all exposed ceilings and ceiling structures in resident rooms and staff work areas should be cleanable. Finished ceilings are not required in mechanical and equipment spaces, shops, general storage areas, and similar spaces, unless required for fire resistive purposes (Hospice Inpatient Facility Construction 2010).

2.2.4 COLOUR IN HOSPICE DESIGN

Colour has always been important as it is associated with moods and feelings since the hospice is not only a place for the dying but also a place for the grieving family and friends. Below is a discussion on some colours (red, pink and orange, green, blue, yellow, lilac, purple, brown, grey and black) and their psychological implications on the health of people (Colour, Environment and Human response, 1996).

Red is associated with danger, passion, energy, warmth, anger, rage adventure and optimism. The colour red is known as a sociable and lively colour and is used to stimulate the appetite, making this colour a perfect choice for dining rooms. Too much red can raise the blood pressure and the rate of breathing. Red can also be overpowering and lead to headaches. It is a good idea to vary the shade of red on one wall or just use it for accessories. Red should never be used in a baby's room. Colours with red tones such as peach will be used in the dining areas of the proposed hospice facility (Colour psychology, 2006).

Pink is associated with love, fresh, being flirtatious and distinctly feminine. Pink is a good colour for bedrooms as it can be peaceful and restful. This will be used in the female rooms (Colour psychology, 2006). Orange is associated with stability, reassurance, warmth, sunset and autumn leaves. It inspires appetite and aids digestion. Architecturally, it is best for living and dining rooms. Orange can make a room look smaller; therefore it can only be used in a room with lots of natural light (Colour psychology, 2006).

Green promotes feelings of well-being and harmony. It is associated with nature, security, stability and balance. It is associated with concentration and intellect. It is calming in a neutral, positive sense and the most restful colour to the eye. It is best for offices and study areas and bathrooms. Green can make people complacent or too laid back, therefore the injection of different shades of green such as deep olive or the colour of new leaves is necessary to make the room fresh, thus green was used in the therapy rooms and resident rooms (Colour psychology, 2006).

Blue is noted to be soothing and calming. It is associated with loyalty, serenity, authority, and protection and contemplation. It prevents nightmares and promotes intellectual thoughts. In the correct shade and application, blue can "slow the pulse rate, lower body temperature, and reduce appetite, relieve headaches, migraines and muscle cramps". Blue is considered a business colour because it reflects reliability. It is best for bedrooms and bathrooms. Depending on the natural light in the room, blue can look cold and therefore be unwelcoming (Colour psychology, 2006).To prevent the rooms from giving an unwelcome atmosphere, blue with a warm undertone such as oceanic turquoise or shades of wispy clouds will be used.

Yellow heightens energy levels, creativity and stimulates the intellect. It cancels out feelings of heaviness or oppression and can bring feelings of warmth and joy. It is best for kitchens, dining rooms or north facing rooms. Yellow must not be used for bedrooms as it is not a very restful colour. Some stronger shades can enhance feelings of emotional distress (Colour psychology, 2006). Due to this reason, yellow will not be used in any of the resident rooms.

Lilac is associated with femininity, spiritual matters as it simulates the misty area between the sky and heaven. It is best for bedrooms and bathrooms to create a stress free sanctuary (Colour psychology, 2006). Lilac will be used for some of the female rooms.

Purple is associated with magic, creativity, joy, fertility, sensuous, luxurious and sex. It is also best for bedrooms. Purple was once reserved solely for nobility. Purple can be overpowering, thus the need to tone it down as a lighter shade of purple. It will be used for focal walls to just accessories some of the therapy rooms (Colour psychology, 2006).

Brown is associated with stability and security and is a very practical colour. It is best for Living rooms. The colour brown is also known as the 'new' neutral and with the various shades of taupe and beige brown, will look great with almost any colour (Colour psychology, 2006). Grey is associated with sophistication and is best for all rooms. Neutral colours such as grey can be used to bring sense of order and peace to a colourful palette (Colour psychology, 2006).

Black is associated with drama, death and eccentricity. It is a non-colour that absorbs colour and reflects nothing back. Black is best for nothing in particular but can be used in moderation. Black is most commonly connected with depression and should not be use for a base colour but use to temper the sweetness of colours like pink (Colour psychology, 2006).

2.2.5 NATURAL AND ARTIFICIAL LIGHTS AND HEALTH

Lighting alone can create completely different atmospheres. To state the obvious, windows provide a home with daylight. Daylighting is important. Studies show that natural daylight is a significant factor to the well-being of those who inhabit homes. Indications are that those who are deprived of natural light can be subject to headaches, fatigue, and faintness and can even become ill. As window technology has evolved, it has become possible to bring more daylight into homes. Research on windows and daylighting recently pointed out that the percentage of openings in a typical house has increased by 25 percent in the past 20 years (Lighting through Windows, 2000).

Designers seek new and better ways to not only bring more light into the interior of a home, but also provide a view of the world beyond its walls. Designers also know that the placement of windows, and even their makeup, can have a significant effect on the energy requirements of a home. Some years ago, the only consideration that many designers gave to the orientation of a home and its glass surfaces was to provide overhangs that sufficiently shaded windows (Lighting the home, 2009). Artificial light can be introduced into a space not only for better sight during the night, but also when natural lighting is inadequate. These can be in the form of overhead lights and table or floor lamps (Lighting the home, 2009).

A lot of light is needed in any given room. This might be because our eyesight is bad, or it might just be our general preference for a lot of light in a room. These could be ceiling mounted fixtures and often the coverings on these can be quite elaborate and decorative. One could also install ceiling chandeliers or ceiling fans which have lights on them as well. Using overhead lighting in a hospice room will spread the light throughout the room. This alone can make the room seem a little less cosy, but much more active, alive and invigorating (Lighting Schemes and ideas, 2006).

For a room to have a more cosy, intimate and inviting appeal to it, it is necessary to use table or floor lamps instead of overhead lights. One can still get that cosy and intimate feeling using the daylight style bulbs in lamps however; the space can also be enhanced by using standard incandescent bulbs. Both are good choices for creating or adding mood and elegance in almost any area of a room. Floor lamps are excellent for creating a cosy reading

corner, and table lamps are best for bedside tables (Lighting Schemes and ideas, 2006). When designing with artificial lights, the various parts of the residential areas of the hospice should be considered and factored in. These are areas such as, hallways, the kitchen, living areas, private rooms, and bathrooms (Lighting the home, 2009). Simple up lighters such as floor lamps or lights which have been fixed to the wall turned upward, placed at intervals along the wall and up the stairs will chase the light up onto the ceiling. The treads and risers of the stairs need to be clearly visible and there should be no dark corners. Landings should be adequately lit up. Recessed spotlight should be used in each step for a more modern effect. Finally, the main overhead light should be at the top of the stairs rather than the bottom to reduce the risk of accidents within the facility (Lighting the home, 2009). A central pendant light gives a good general light, but is not enough for working. Kitchen light should be similar to natural light so one does not get dazzled. High level task light at various areas in of the kitchen, such as the sink and cooking area is needed (Lighting the home, 2009). The living areas in a hospice are used for everything; dining, entertaining, reading and watching television and therefore there is the need for a flexible lighting scheme. This is where accent lighting can be used. (Lighting the home, 2009).

For effective lighting in hospice living rooms, table lamps can be placed around the edges of the room on shelves and tables as they radiate light inwards and make the room feel spacious but cosy. It is also necessary that the central overhead light does not cast unflattering shadows. Wall washers give a good level of illumination but the light reflected back will be tinted by the colour on the wall. Positioning a free standing up lighter or standard lamp behind the sofa will help in reading. Only mount wall lights beside a feature that will not be moved, such as alcoves (Lighting the home, 2009).

The right light in bedrooms will help relaxation and a good night's sleep. But strong light is needed so one can get dressed in the morning. The most important bedroom light is the one at the bedside which will aid reading in bed, especially for the patients who cannot get out of bed (Lighting the home, 2009).

It is advisable to stud the ceiling with low-voltage spotlight or down lights which wash the walls with light. Down lighters cast pools of light onto the surfaces below and are great for water and glass (Lighting the home, 2009).

2.3 CASE STUDIES

To acquire a holistic view of the hospice, a reseach on the hospice of the comforter's Central Florida and St. Oswald's children's hospice-Gosforth, Newcastle, was undertaken.

2.3.1. HOSPICE OF THE COMFORTER'S (HOSPICE HOUSE)– CENTRAL FLORIDA

More than 18,000 square feet of patient care area provides comfortable surroundings decorated with southern elegance. It cost approximately $5.7 million to build this much-needed facility to care for Central Floridians. Hospice of the Comforter's Hospice House is a place to live in peace with comfort and dignity (Hospice house, 2001). The plan of the hospice of the comforter is shown in Figure 2.1

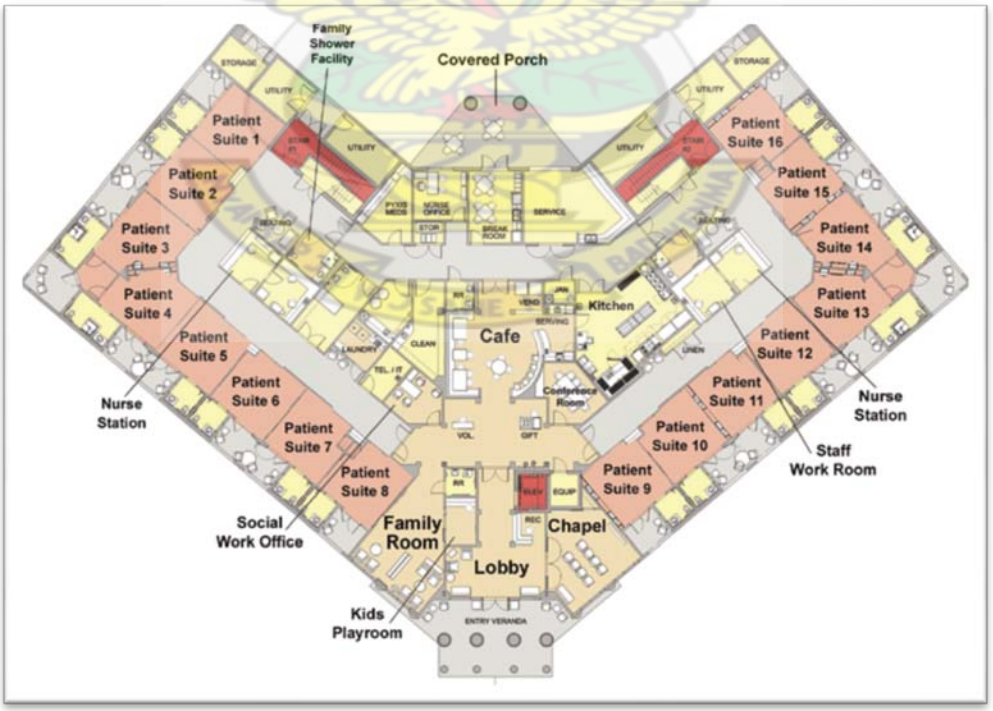

Figure 2.1: Ground floor plan (Source: Hospice house 2001)

Figure 2.2 below is a typical dining hall.

Figure 2.2: The dining area (Source: Hospice house, 2001)

The Hospice House has 16 comfortably furnished private care suites that accommodate overnight family visits. Each warmly decorated room features cozy seating areas, lots of natural light and access to outdoor covered porches. Two family gathering areas offer a place for patients and families to enjoy music, TV or conversation. The facility also offers a welcoming family dining area; children's play area and a chapel. It is equipped with the latest technology for the convenience and comfort of the patients and their families, including a sound masking system throughout the building (Hospice house, 2001).

This home-away-from-home is a warm, comfortable setting in which patients and their families receive the highest quality hospice care available in Central Florida. This state of the art facility is the only free-standing inpatient Hospice House serving Orange, Seminole and Osceola counties. It provides a warm, home-like atmosphere where patients can receive special care while being surrounded by friends and family members (Hospice house, 2001).

Figure 2.3: One of the patient bedrooms (Source: Hospice house, 2001)

Many patients choose Hospice of the Comforter during their final months of life so that they can have the feel of living in a homey environment, where family can come to visit so they can be in the presence of familiar surroundings and precious loved ones (Hospice house, 2001).

2.3.1.1 THE MERITS AND DEMERITS OF THIS CASE STUDY ARE DISCUSSED BELOW:

Merits

1. The arrangement of the spaces in this facility is very compact and presents an interesting layout as shown in Appendix five. It is worthy to note that the facility is under one roof, but in the tropical developing countries like Ghana, it would be better to spread the spaces out to aid in ventilation, lighting and fostering of culture by the introduction of courtyards in the design.
2. The facility has functional spaces such as dining areas, living areas and to foster interaction between both patients and their family members.
3. The patient rooms are 24m2 making them very spacious and large enough to accommodate the use of wheelchairs. Arrangement of furniture has been done to harness views into the green areas.

4. The concept of bringing nature into the space was exhibited here by both bringing in greenery and painting scenes of nature on the walls for relaxation as shown above in Figure 4.2.
5. Lighting has been duly considered by using large half-hung windows to aid in providing both good lighting and ventilation (Hospice house, 2001).

Demerits

1. The layout does not encourage people to stay outdoors for a long time; because the area dedicated to outdoor landscaping is minimal this is mainly because of the temperate climatic conditions experienced in their environment.
2. The chapel may intimidate certain class of people from using the space due to its location and design. The chapel is located at the entrance of the facility.
3. Long corridors will create natural lighting problems indoors due to the depth created by this.

In conclusion, great care has been taken to design the interior spaces very well. The main concepts in this case study, which I will incorporate in my hospice design, are the creation of a homelike environment for the patients and the introduction of greenery into the interior spaces.

2.3.2 ST.OSWALDS CHILDRENS HOSPICE-GOSFORTH, NEWCASTLE

Figure 2.4: The general overview of children's hospice. (Source: children's hospice 2004)

Figure 2.5: The general overview of children's hospice. (Source: children's hospice 2004)

The play area as shown in Figure 2.6, has well defined soft and hard landscaped areas. This is to aid in play and learn. Non-slip tiles are used to prevent children from slipping. In the proposed hospice design, courtyard gardens as shown in figure 2.8 were incorporated in the design and well monitored and contained play area for the children was provided. Different garden types were used to introduce variety and a conservatory as shown in figure 2.7 was introduced so that users of the space could enjoy some sunlight especially those too weak to go outside.

Figure 2.6: Outdoor play area

Figure 2.7: Conservatory

Figure 2.8: Courtyard garden

Figures 2.9 and 2.10 show two types of bedrooms, incorporated into the interior design concept it will help stimulate the children as they stay indoors.

Figure 2.9: Bedroom type 1

Figure 2.10: Bedroom 2

The multi sensory room (Figure 2.11) like its name, stimulates all the senses of the children, has a kaleidoscope of colours, sound, touch and smell. The room height is 4.2m and it has different wall textured finish for children to touch at all times (CABE, 2001).

Figure 2.11: a Multi sensory room

Tiles and carpeting were used as the major and basic floor finish within the interior spaces. Large picture windows and French doors were used extensively so that users can have a clear view of the outside world. Window and door treatment entails the use of curtain blinds and curtain fabrics are also used. Blinds are used for the general areas and curtains for the bedrooms (CABE, 2001).

The proposed design houses a multi-sensory room for the children in the facility, has large windows to promote good lighting and ventilation within the facility. Perforated fences were used to create semi-partial views. Courtyards and well defined landscaping were also incorporated in the design.

2.4 FENG SHUI

Feng shui is an ancient system of balancing the good and the bad, the yin and the yang. This is Chinese philosophy which understands the fact that the arrangement and positioning of elements in our surroundings can affect the flow of energy, which can either be favourable or unfavourable on one's health and wealth. In this research Feng shui principles are applied to help in creating and organising the space to be stress free and comforting for the terminally ill patients, visitors and staff. Feng shui (Chinese expression) simply means wind-water in English. It is also an environmental science based on an interpretation of the natural world which enabled the Chinese to determine the passage of time. Feng shui gives us advice on how to create environments in which we feel comfortable and supported. It focuses on "chi" or the life force that flows throughout. In holistic design theory, that force is considered our personal energy force. It needs to be nurtured, enhanced and encouraged to flow freely in order to bring health and well-being to us through our surroundings. Feng shui involves finding balance, encouraging flow and thoughtful placement. (The practical encyclopaedia of Feng shui 2003) using the principle of free flowing space, arctangents were used in the corners of the building, and water fountains and greenery introduced into the internal spaces.

2.5 HEALING GARDENS

The meaning of a healing garden is "a garden in a healing setting designed to make people feel better." The goal of a healing garden is to make people feel safe, less stressed, more

comfortable and even invigorated. (Eckerling, 1996). Thus there is the need for a healing garden in a Hospice facility.

Throughout history gardens have been used to aid in the healing process - from the Japanese Zen Garden to the Monastic Cloister garden. However, with the advances in medical technology in the 20th century, the use of gardens as healing elements began to diminish. Fortunately with the recent interest in complementary and alternative therapies, which emphasizes healing the whole person -- mind, body, and spirit -- rather than simply alleviating symptoms, the interest in garden concept as healer has been revived (SULIS, 2001). Since the hospice is not a place for physical healing, the healing garden is used in this design as a place where the patients can have their peace of mind to die in peace.

Research has proven the therapeutic benefits of gardens. It has been found that viewing natural scenes or elements fosters stress recovery by evoking positive feelings, reducing negative emotions, effectively holding attention or interest, and blocking or reducing stressful thoughts. When viewing vegetation as opposed to urban scenes, test subjects exhibited lower alpha rates which are associated with being wakefully relaxed. Research has also showed that patients with views of nature are more relaxed, and took less pain medication and experienced fewer complications than those with a view of a brick wall. These are some of the inner healings the terminally ill may need as they prepare to die. Although more research is necessary, results based on research thus far indicate the healing effects of natural elements such as gardens (Ulrich, 2001).

2.5.1 THE DESIGN OF HEALING GARDENS

Generally, designing healing gardens follows the same considerations used in designing any other garden. However, the following take on special meaning in healing environments: functionality, maintainability, environmentally sound, cost effective and aesthetically pleasing. Healing gardens must maintain the purpose for which it was designed. It is imperative because the garden needs to accommodate the limitations of the users of the space such as high immobility and the failure of some of the five senses. It is also important that the garden design be maintainable both for physical safety and therapeutic benefits. At institutions such as hospitals, it is especially important that the garden be easily maintained

because a poorly maintained garden could make patients lose confidence that they are being well taken care of by hospital staff (SULIS, 2001).

Healing gardens should also be designed with materials that enhance the environment instead of causing harm to it (SULIS, 2001). If the garden is not environmentally sound for example using plants that could be toxic or poisonous, could be detrimental to the users of the space, especially those who are terminally ill.

Often times the funding for healing gardens is raised through donations. Therefore is it important that the garden design be constructed on a low budget in order, not to deplete the funds of the facility at any given time. Finally, healing gardens are meant to provide pleasant surroundings to produce restorative effects for its users. The garden will not be successful if it is not visually pleasing (SULIS, 2001).

2.5.2 PRINCIPLES OF DESIGNING HEALING GARDENS

The guiding principles for designing an effective healing garden include unity, simplicity, balance, scale, focal points and planting.

It is important to use the principles of design to create unity within the healing garden design. Simplicity is essential in designing healing gardens to keep the space easy to understand. Many of the people using healing gardens are dealing with stress: it is important that the spaces are not designed to be busy to add any additional stress. At the same time, the design should include a variety of form, texture, seasonal interest, and colour to provide sensory stimulation (SULIS, 2001). Not having enough interest can also be stressful to the users of the space.

It is important to create balance, whether symmetrical or asymmetrical, so the space feels stable as a whole. It is recommended to use key, specimen, group, and mass plantings to create emphasis within the space. This provides focal points to help people orient themselves in the garden. Create sequence or smooth transitions from one area of the landscape to another. This is especially important to create good flow when going from public gathering areas to more private areas for solitude. It is also important to use the appropriate scale. If the

healing garden is located by a high-rise building such as a hospital, elements such as trees help to bring the space down to a human scale (SULIS, 2001).

2.5.3 DESIGN GUIDELINES OF HEALING GARDENS.

The design guidelines pertaining to healing gardens are paths and surfaces, spatial layout, treatment of surfaces and circulation.

2.5.3.1 PATHS AND SURFACES

Effective paths and surfaces for healing gardens have been researched into. The following discussion is based on the standards provided by SULIS 2001.

Design five-foot minimum width at paths for one-way traffic to accommodate the turning radius of a wheelchair and seven-foot minimum width for two-way wheelchair traffic. Figure 2.12 illustrates this requirement for paths.

Figure 2.12: Path width and design. (Source: SULIS, 2001)

There is the need to create a change in texture at the edge of a path to help people with low vision to recognize when they are off the path. However raised edges on a path can create a tripping hazard. Path surfaces need to be firm, smooth, and provide traction to allow for easy movement of wheelchairs, gurneys and IV poles. Paving with deep grooves can be an obstacle. Concrete is a good choice, but can be expensive. Decomposed granite is good for people in wheelchairs, but not for those on crutches. Newer rubberized paving materials are

firm enough for wheelchairs and also cushion falls (SULIS, 2001). The paths leading to the healing gardens in the proposed hospice design was constructed with granolithic paving.

There is the need to limit grade changes in most highly used outdoor areas. The slope of a walk must not exceed 5% or 1 foot of rise for 20 of feet length. Cross slope must not exceed 2% or 1 foot of rise for 50 feet of length as shown in Figure 2.13 (SULIS, 2001). Thus, in this design, all steep gradients will be filled up to enable the easy access around the facility.

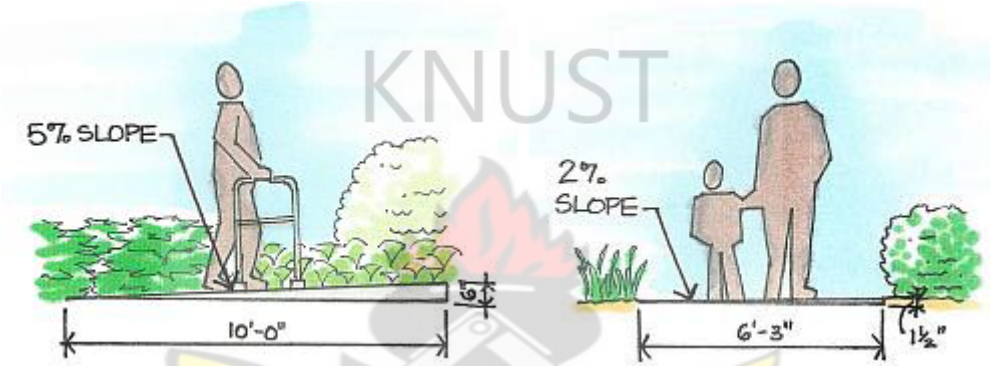

Figure 2.13: Maximum slope and cross slope. (Source: SULIS, 2001)

Where slope does exceed 1:20, a support railing should be provided for those with unsure footing. When dealing with healing gardens, building codes are necessary so one can have an idea of where to start in terms of clearances. They are often the bare minimum that should be allowed (SULIS, 2001).

2.5.3.2 SPATIAL LAYOUT

The use of a good spatial layout provides a variety of spaces to accommodate different activities and different levels of privacy, from spaces that allow group activities to spaces that allow solitary contemplation. It also creates a screen between people in the garden and any windows looking out onto the garden to avoid a "fish bowl" affect. Spatial layout provides transition areas between public and private garden spaces thus providing users of the garden options for control of privacy as illustrated in Figure 2.14 (SULIS, 2001).

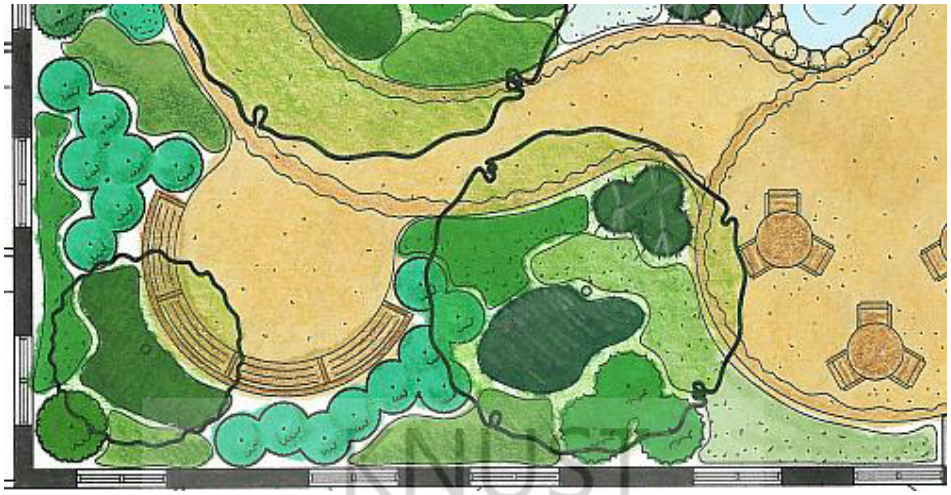

Figure 2.14: Planting beds provides (Source: SULIS, 2001)

Design the garden away from noisy streets or mechanical elements such as air conditioners. Where undesirable noises cannot be avoided, incorporate features such as a water fountains or wind chimes to mask the sound. This helps to reduce the level of noise pollution into the facility (SULIS, 2001).

The layout of the garden should be easily "readable" to minimize confusion for those who are not functioning well. Paths should be clearly laid out. Landmarks should be provided to help orient the users of the space. This can be done with elements such as sculpture, a profusion of flowers, or a water feature (SULIS, 2001).

It is recommended that a variety of sunny and shady areas for people with varying tolerances to light exposure be incorporated in the hospice design so that all the users of the facility can enjoy the outdoors. Seating may be provided for those using the garden. Lightweight chairs are desirable in allowing users to move the seating wherever they wish. Plenty of sturdy seating with backs and arms should be provided for those that need support for sitting for long periods of time. Water features should be provided throughout the gardens to aid in creating a soothing atmosphere for the patients, as the sound and sight of different forms of water provides a calming effect on people (SULIS, 2001).

2.5.3.3 PLANT SELECTION

There is the need to use plants which might have special, sacred or evocative meanings for the cultural groups and age groups being served when selecting plants materials. If possible, use plants that have some medicinal value (SULIS, 2001).

For this design, I will choose plants that engage all the senses such as aloe vera, gerbera daisies, spider plants, and ficus. Plants such as weeping willows that make pleasant sounds as wind rustles their leaves may also be used. I will also provide seasonal interest allows people to connect with the cycle of nature, avoid thorny or toxic plants, especially in gardens used by children or people with certain psychological disorders. It is also advisable to choose insect and disease-resistant varieties to eliminate pesticide use. Planting higher maintenance plants such as vegetables, herbs and cut flowers in easy-to reach or raised beds helps the patients feel useful as they can easily reach it and help maintain the plants. Finally, I will incorporate elements that will attract wildlife including berry-producing shrubs, birdbaths and bird feeders. Plants that attract large numbers of bees or undesirable insects will be avoided in this design.

2.6 HOSPICE GARDENS

A hospice garden is a type of a healing garden. It is mainly designed to cater for the needs of hospice patients. In designing a hospice garden, it is necessary to apply some basic design principles. These include provision of protected spaces, views, water features, and rails and pathways.

The provision of transition areas between indoor and outdoor spaces, such as screen porches or overhangs to provide protection from the elements, allow eyes to adjust to bright outdoor light. There is also the need to provide a place to sit and view the activities without being involved in them. Hearing is often the last of the senses to leave a dying person and thus providing soothing natural sounds in the garden will help aid this (SULIS, 2001). To encourage people to touch things in the garden, I will use plants and structures with a variety of textures. I will provide a view from the window for patients who cannot go outside so

that they can also enjoy the outdoors. It is also advisable to design with materials that improve, rather than wear out with age (SULIS, 2001).

Providing a water feature is important as water is a soothing agent. Still water can provide a setting for meditation or prayer while the sound and view of moving water is undeniably restorative. I will use plants with different leaf textures, forms, and smells to stimulate the senses and memory and provide different lengths and difficulty of walking routes that will provide choice to residents with different needs (SULIS, 2001).

Providing handrails will encourage less able residents to participate in outside activities. Sunscreens, trellises, fences, walls, baffles, and plant materials will be provided to alleviate the harsh effects of the sun and wind in outdoor spaces. It is recommended to place and select trees with dense canopies such as birches and oaks to reduce glare and control light penetration.

Pathways should contrast with planting areas to help define the boundary between path and plantings for residents with reduced depth perception. There must be a clear organizational pattern with well identified paths, a clear hierarchy of spaces and features or focal points to help orient residents (SULIS, 2001).

The colour of chairs and tables should contrast with floor material so they are distinguishable by people with sight impairments. It is important to choose seating with back support and arm rests. Also situate plantings to provide views from windows looking out onto the garden for people who are unable to go outside (SULIS, 2001).

2.7 THE BENEFITS OF WATER IN HOSPICE DESIGN

Our bodies are seventy percent water. Water contains vital elements that keep our bodies healthy, and also contains negative ions, which are released into the air when water tumbles or cascades from a waterfall. Negative ions affect mood and the ability to concentrate, clean the air, and promote a sense of tranquillity and inner peace. There are many reasons for using water in a hospice environment. They include stress relief, noise reduction and a natural humidifier (The manual of below- grade waterproofing systems, 2000)

2.7.1 STRESS RELIEF

Waterfalls are purchased for many different reasons, including; stress relief, to compliment interior decor, to create a soothing environment, or even for natural humidification. Indoor waterfalls are a simple and stunning way to enhance the beauty of one's home, welcoming guests with elegance (Enhance indoor Environmental quality, 2009).

2.7.2 NOISE REDUCTION

Indoor and outdoor waterfalls can reduce distracting and unpleasant noise from the surrounding environment. This is especially useful for quiet areas and rooms. The sound of moving water promotes a sense of calm and covers the detrimental effects of noise pollution. Home water features can be customized to suit one's mood and style. Indoor water features can be personalized to match any decor. Outdoor waterfalls can add tranquillity to any garden or landscape (Enhance indoor Environmental quality, 2009).

2.7.3 NATURAL HUMIDIFIER

Water evaporates when it cascades over itself and mixes with air. Indoor water features can also be used as beautiful, elegant humidifiers, without the unpleasant noise of a fan. Humidity is important for maintaining proper health. It keeps skin, hair, and nails looking great and assists with proper breathing. Dry air causes dry skin and makes the lungs work harder (Enhance indoor Environmental quality, 2009).

Indoor water fountains will not promote the growth of mould and mildew like humidifiers do. They look, sound, and feel more pleasant. They promote a healthy environmental ambiance while cleaning the air you breathe (Enhance indoor Environmental quality, 2009).

2.9 PARKING STANDARDS FOR RESIDENTIAL INSTITUTIONS

There is the need to design roads and parking appropriate for the use of the staff, patients and families of the hospice facility. There are parking standards available in making design efficient and effective. For details of the standards, refer to table 1 in appendix 2

CHAPTER THREE: RESEARCH METHODOLOGY

Obtaining the relevant information involved the use of various research instruments being employed, In line with the objectives of the study,

3.1 DATA COLLECTION

The research methods used include primary sources, which are interviews, measured drawings, personal observations, photographic recordings, and case studies. Secondary research sources which were used were mainly ng literature reviews from libraries and the internet (electronic library). These are further enumerated below.

3.1.1 PRIMARY SOURCES

These included the use of interviews, measured drawings, personal observations, personal recordings and case studies.

3.1.1.1 PERSONAL OBSERVATIONS.

The researcher undertook a number of exploratory investigations by visiting an aids hospice facility at Koforidua in the Eastern region of Ghana, Holy Trinity Spa and Health Farm in Sogakope and Allure Spa in the city in Accra. The main purpose of this was to acquire a firsthand experience of how these facilities were used.

3.1.1.2 INTERVIEWS

Some doctors were interviewed as to the need of a hospice facility in Ghana. Out of a sample size of 40 taken from the Korle-bu Teaching Hospital, The 37 Military Hospital, The Komfo Anokye Teaching Hospital and the Koforidua General Hospital respectively, 70% agreed to the need of Hospice facilities in Ghana. According to these doctors, most of these terminally ill are sent home because the hospitals do not have the facilities to cater for them. Most of the time, these people were taken to spiritual churches where they die in pain. For an effective study, there was a need for interactions with the administrator, staff and patients of the hospice to find out whether the facility was serving its purpose. An informal form of interview was conducted with personnel from the Hospice by the Sea from the United States.

Further interviews were conducted with the staff of Allure and Holy Trinity Spa, to aid in gaining information for the other facilities which might be needed for the hospice.

3.1.1.3 PHOTOGRAPHIC RECORDINGS

Photographs of critical and important facilities and activities that will aid the completion of the project were taken with camcorders and digital cameras.

3.1.2 SECONDARY SOURCES

This was mainly through literature review via books and the internet. This includes history and previously related literature by other authors who had similar enthusiasm, from libraries, Internet Search and the Microsoft Encarta.

3.1.2.1 LITERATURE REVIEW

An extensive research had to be carried out to explore outdoor and indoor spaces that have been created or not created at all in hospice design, due to the fact that the main objective of this research is to create an efficient hospice environment for Ghana.

In this, two main methods were used to acquire information. These are:

- Relevant Websites of the Internet
- Library Reference which includes Journals, Magazines and other related Literature.

3.1.2.2 RELEVANT WEBSITES AND SEARCH ENGINES ON THE INTERNET

Giving all credits to technology, access to information all over the world has become possible by the powerful tool, the Internet. This medium was used to supplement and compliment the obtained information from the library and other literature source.

3.1.2 .3 LIBRARY REFERENCE AND RELATED LITERATURE

Magazines, journals, encyclopaedia, and dictionaries found in the library, which had relevant information were used. These have been enlisted in the page of references. It must however be explained that the information of this form was quite limited.

3.1.2.4 CD-ROMS AND ELECTRONIC SOURCE OF DATA

The latest version of the Microsoft Encarta Encyclopaedia, the 2007 updated version was also used which provided information particularly on the designs of Hospices and healthcare facilities. Apart from this, the other relevant information from this source had to be sifted from the broad write-ups on some of the theme.

3.2 ORGANISATION OF CHAPTERS

Data collected for the research was organized into five chapters. Chapter one gives the background and general overview of the project. It explains what the whole project is about. Chapter two covers the information gathered from written documents such as journal, books, and magazines. Chapter three gives an insight into the research method used in the collection of data. Chapter four covers the result of the author's findings as well as discussions on the data collection. Chapter five contains summarized information on the topic, the author's closing remarks and design proposals.

CHAPTER FOUR: RESULTS, FINDINGS AND DISCUSSIONS

This chapter concentrates on the findings of the surveys. It summarizes the pertinent ideas that could be used in the proposed hospice design. To further aid in designing an efficient hospice facility, special field studies were undertaken at the Matthew 25 House in Koforidua, Holy Trinity Spa and Health farm in Sogakope and Allure Spa in the City in Accra. Research was also done into the technical details pertaining to hospice spatial design. The proposed design its phasing, cost analysis, and environmental impact assessment is also discussed.

4.1 DISCUSSION ON IMPORTANT ELEMENTS FROM LITERATURE REVIEW.

From the literature review, there will be the need to take into consideration some factors which are pertinent to hospice design such as hospice design principles and construction. It will be prudent to incorporate healing gardens in the form of hospice gardens, meditation gardens and enabling gardens. There is also the need to consider the climatic and cultural conditions in the locality.

Indoor and outdoor waterfalls will also be used for stress relief, the reduction of distraction and unpleasant noise from the surrounding environment, to compliment interior decor, to create a soothing environment, and to enhance natural humidification.The use of colours such as shades of blues, lilac and greens for the private rooms, colours with hues of red for the eating areas and beiges and whites will be adhered to. The children's areas will also be decorated with colours that are appealing to children such as red, blue and yellow.

4.2 ANALYSIS OF LOCAL FIELD STUDIES

To further aid in this research, some field studies were done. Below are discussions of these findings.

4.2.1 MATTHEW 25 HOUSE, KOFORIDUA-EASTERN REGION, A HOSPICE FACILITY IN GHANA.

Matthew 25 house (shown in Figures 4.1 and 4.2) is a non-governmental organization (N.G.O) in Ghana, helping those infected with HIV/AIDS and is being developed to become a training and hospice facility in Ghana. Field study revealed that it has 150 patients, 30% are men and 60% women. 10% of the patients are children. Spaces within the facility include an office, a reception (Figure 4.3), a kitchen yard, a sanitary area, a storage area, six rooms and a courtyard.

Figure 4.1: Matthew 25 house

Figure 4.2: The general overview of Matthew 25 House.

The courtyard (Figure 4.4) facilitates group meetings and interactions. It also aids in lighting and ventilation of the internal spaces. The general atmosphere is not conducive for the required hospice care environment. Rooms provided are not enough to house patients, thus creating an inconvenience for those coming from afar.

Figure 4.3: The reception

Figure 4.4: The courtyard

Even though the Matthew 25 house is not specifically designed to cater for hospice patients, the courtyard idea of design will be introduced in my design to also facilitate interactions and to aid in good ventilation and lighting. Due to the 2:1 ratio of women to men, it is necessary to create more space for women.

4.3 SPECIAL STUDIES

Special field studies were also undertaken of the Holy Trinity Spa and Health Farm and the Allure Spa in the City, Accra, to learn how their facilities can help provide inner healing (spiritual and psychological and emotional) to the terminally ill.

4.3.1 HOLY TRINITY SPA AND HEALTH FARM

Holy trinity spa and health farm is a facility gradually being accepted by Ghanaians as an alternative healing facility and vacation spot. This case study was undertaken due to the serene environment created there by blending of architecture with the natural environment. It will be good in the promotion of spiritual and emotional healing for both the patients who are gradually dying and their visitors. This facility is located at Sogakope in the Volta region of Ghana and it is an hour drive from Accra-Tema metropolis. The study concentrated on the use of water, colour, lighting, sound, animals and planting to achieve inner healing.

4.3.1.1 WATER

When entering holy trinity spa, one is greeted by a nature inspired setting, the sounds of peaceful streaming water from the Volta River in harmony with rippling water from a large fountain as shown in Figures 4.5 and 4.6, that provides a serene sanctuary, tranquil river views and peaceful open air pavilions. The scene of the water gives a calming effect to the patients.

Figure 4.5: The Volta River from the site

Figure 4.6: The central fountain

4.3.1.2 COLOUR

The predominant colours used at the facility are green, blue, white, beiges and brown. These have a psychological effect on the users. Green helps to calm, soothe and rejuvenate people. It is the major colour which runs through the facility as shown in Figures 4.7 and 4.8. Blue is used in areas where water features are predominant for example at the fountain as shown in Figure 4.9. White is used in some of the interior spaces, not only to break the monotony of the greens but also to portray a sense of cleanliness and openness. Beiges and Browns (Figure 4.10) are used for flooring and also to help carry the natural colour through the spaces.

Figure 4.7: Apartments in shades of green

Figure 4.8: The Interior of restaurant

Figure 4.9: The blues of the fountain

Figure 4.10: The natural beiges and whites

4.3.1.3 LIGHTING

Local materials such as bamboo, calabash, local lanterns, wicker shades and straw hats were blended with foreign brands for the lighting fixtures, creating a rustic feel in the midst of modernity. Examples of these are shown in Figures 4.11, 4.12, 4.13, and 4.14 below.

Figure 4.11: Straw hat lighting

Figure 4.12: Bamboo torch

Figure 4.13: Foreign chandeliers

Figure 4.14: Lantern on restaurant tables

4.3.1.4 SOUND, ANIMALS AND PLANTING

Sound is further enhanced by the provision of hidden speakers all over the facility to provide calm soothing music alongside the sounds from animals around (peacocks, parrots, squirrels, ducks, camels and horses) and the whistling and rustling of plant leaves as shown in figures 4.15 and 4.16.

Figure 4.15: Hidden speakers at an entrance

Figure 4.16: Peacock in facility

In the design of the proposed hospice, I incorporated the use of water in the form of waterfalls, ponds and indoor and outdoor fountains. Natural materials, carefully selected plants and animals were also used to help in relaxation. Soothing colour such as shades of blue and greens will be used. The idea of the use of sound will be enhanced in the proposed design.

4.3.2 ALLURE SPA IN THE CITY, ACCRA

Allure Spa in the City, is also studied because of the way the designer tried to use the interior space to make up for the lack of external space around the facility. This was done by the introduction of some external materials in the internal spaces. Allure is the first day spa in Accra, Ghana. The general colours running through the facility are baby pink and shades of greens as shown in Figure 4.17.

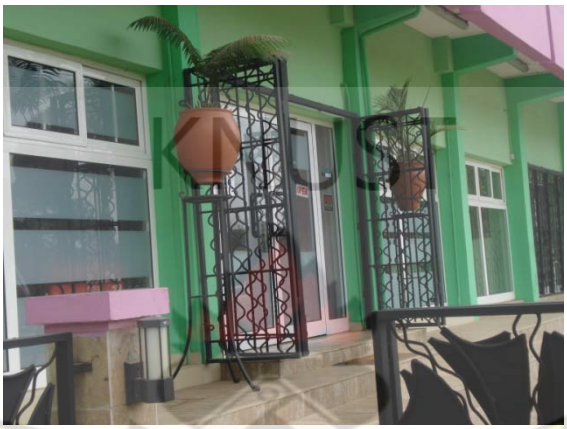

Figure 4.17: The entrance of allure with its theme colours

4.3.2.1 LIGHTING EFFECTS WITHIN THE SPACE

Lighting plays an important role in the healing process. Allure effectively uses lighting in the spa section. The long corridors as shown in Figure 4.18 are dimly lit with scented candles and low wattage light fixtures. The rainbow room (Figure 4.19) which is the lounge of the spa uses transparent materials for the curtains, bringing in different shades of day lighting into the space.

Figure 4.18: The corridor in the spa

Figure 4.19: The rainbow room curtains

4.3.2.2 THERAPY ROOMS

The therapy rooms are painted in different colours allowing the patients to have the option of choosing a particular room for their therapy sessions. The major room colours are the green oasis room, rainbow room, lavender orchid room, blue skies room, brown earth room and the allure pink room as shown in Figures 4.20 and 4.21.

Figure 4.20: Blue skies room

Figure 4.21: Lavender orchid room

The design will include the use of scents like tea tree, lavender, scented candles and table fountains in various interior spaces to enhance psychological therapy. The therapy rooms will be painted with different colours to help sooth clients, as they will prefer to be treated in their own special coloured room.

4.4 TECHNICAL STUDIES

To further aid in the design, studies were made into the technical requirements of spaces related to hospice design and construction. These were on barrier free living, wheel chair usage and internal spaces. Figures 4.22 to 4.30 show some of the facilities considered from Neufert (2000)

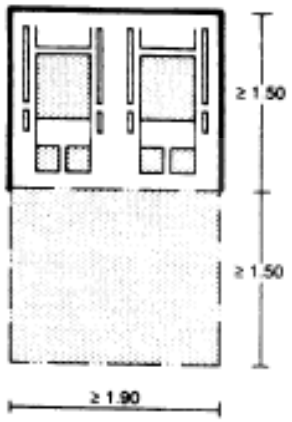

Figure 4.22: Space requirement of wheel chair and movement area

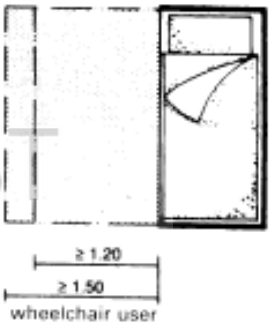

Figure 4.23: Space requirement beside a bed for user and non-user of wheel chair.

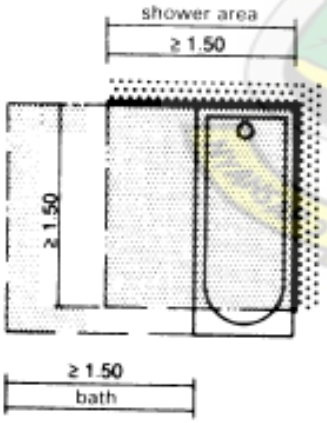

Figure 4.24: Movement area: shower and bath

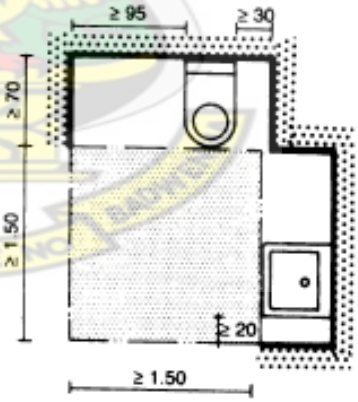

Figure 4.25: Movement area around WC and wash basin.

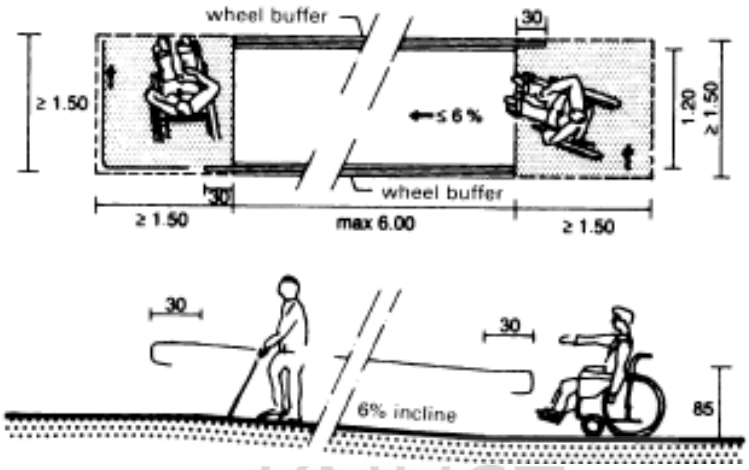

Figure 4.26: Ramp inclination (6%) for wheelchair users

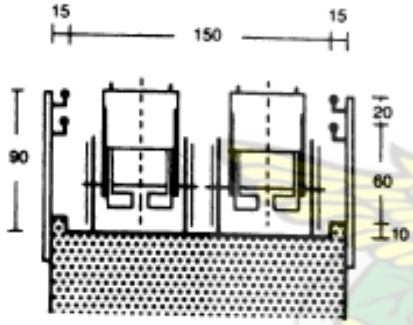

Figure 4.27: Section of ramp

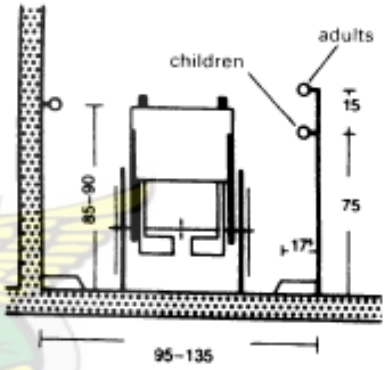

Figure 4.28: Halls and passages

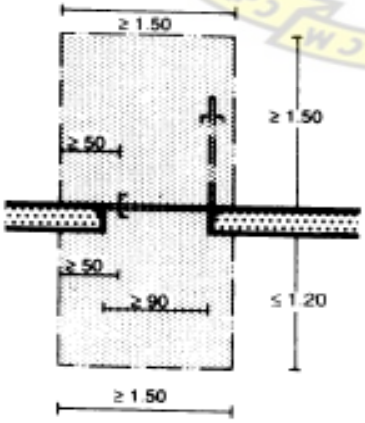

Figure 4.29: Movement areas in front of hinged doors

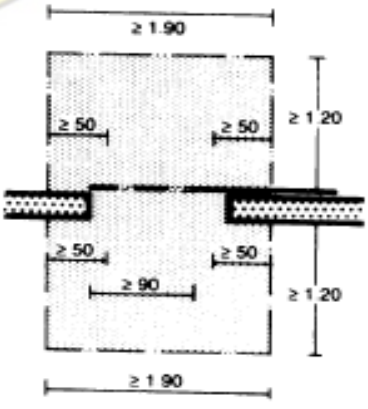

Figure 4.30: Movement areas in front of sliding doors.

A specially designed environment for the disabled needs to be considered to accommodate wheelchairs, and allow sufficient space for moving around in safety. Figures 4.31 to 4.38 taken from Neufert (2000), illustrated some of the standards considered.

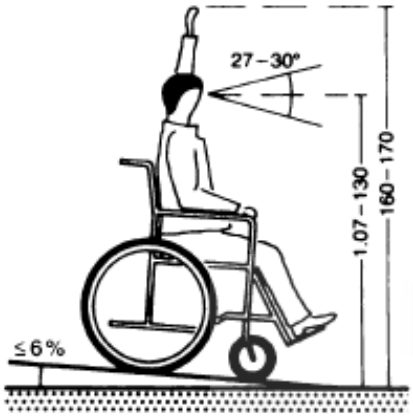

Figure 4.31: Wheel chair on a slope

Figure 4.32: Wheel chair on stairs

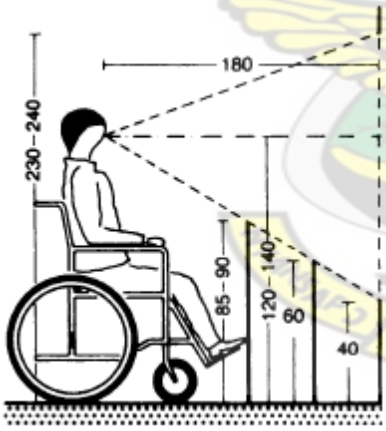

Figure 4.33: Dimensions for window height for wheelchair users

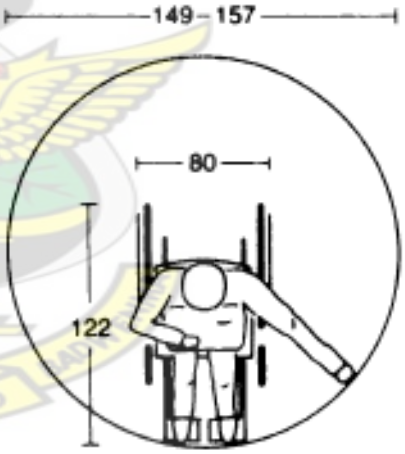

Figure 4.34: Minimum turning circle

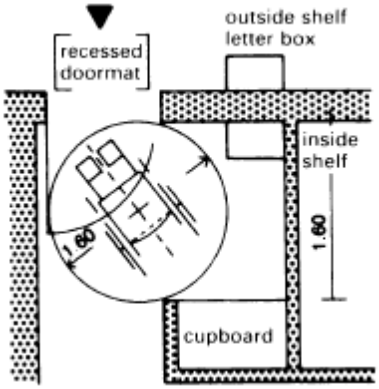

Figure 4.35: Deep entrance area with recessed cupboard

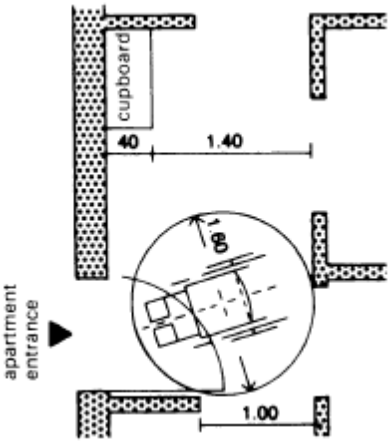

Figure 4.36: Wide entrance area

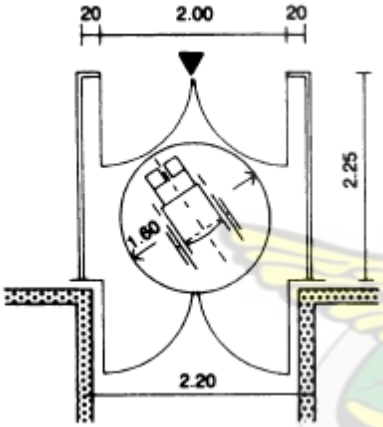

Figure 4.37: Porch with two-leaf door

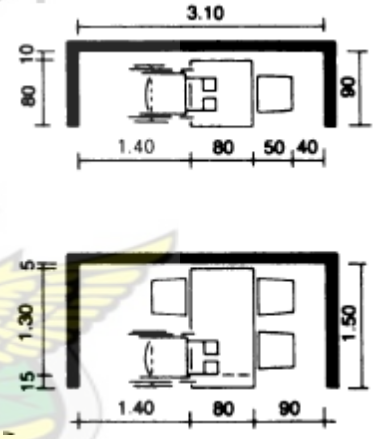

Figure 4.38: Dining area for two-four people

4.5 PROPOSED HOSPICE DESIGN

This section discusses the brief development, site selection and location, site selection and conditions, site inventory, site analysis and the design philosophy concept and its impact on the users.

4.5.1 BRIEF DEVELOPEMENT

The proposal for the hospice facility took into consideration, the cultural and climatic elements of the country. From the research and case studies done, a tranquil and rejuvenating facility which will stimulate the comfort, quality of life and the relief for suffering of the

terminally ill is needed. The design brief (appendix 2 shows the developed brief and accommodation schedule) was developed taking into consideration, four main criteria;

- Hospice care
- Administration
- Tranquility and natural psychological healing (landscaping)
- Services

4.5.2 SITE SELECTION AND LOCATION

From the information gathered during the research, having a hospice in the eastern region of Ghana proved to be very laudable since it was a region with an existing hospice facility and also had quite a high rate of HIV/AIDS infected people. Therefore site studies were done in two main locations, which are, Aburi and Bosomtwi.

4.5.2.1 ABURI SITE

At Aburi, the Gradient of the site (1:20) is too steep and the site have little area for expansion, since it is flanked by residential buildings. The site is almost in the heart of the Aburi Township, thus noise pollution might cause a problem, to make it impossible to achieve the environment needed for the Hospice design. The site was also not large enough to accommodate outdoor areas.

4.5.2.2 BOSOMTWI SITE

On the other hand, the gradient at Bosomtwi is relatively flat (1:150) in a wide valley. It is located out of town, thus a quiet and serene location which is good for the scheme. It is also located near Koforidua, the capital of the Eastern region, and close to the regional hospital to aid in easy, quick and efficient transportation of patients.

4.5.3 SITE SELECTION AND CONDITIONS

A good design responds positively both to its site, climate and culture of the users. The designer therefore has to get an intimate knowledge of both the site and the climate prevalent in the area for which the design is to be built. The correct selection of the site for the project or design is paramount and crucial to the optimum performance of any facility. Since the

facility is a hospice, a quiet and remote site void of all the hustle and bustle of the everyday city environment and where the topography is favourable and has good climatic conditions to promote good landscaping was selected.

4.5.4 SITE INVENTORY

Bosomtwi is located 20km from Koforidua and is an 80km drive from Accra. The total area of the site is 21,970m2. The site extends from Boti River on the east to the Akwa River on the west both in the Bosomtwi Township. The Akwa River has a channel through the north-northwest portion of the site. Mountains can be seen from the western side of the site which near a river. The soil conditions are also favourable for the vegetation on the site. Electricity poles and lines are available on site but restricted to the perimeter of the site in the southern boundary. There are no water pipes available on the site as boreholes are used as the source of water. No telephone facilities are available on site. Currently there is only one major access into the site. The rest are through foot paths. There is a tarred road adjacent to the site and it is in a fairly good condition. There is also an un-tarred road on the site. Currently there are some wooden structures at the entrance of the site which would have to be relocated because they are drinking bars. Maintaining these structures on the site would defeat the purpose of a quiet environment for hospice designs.

4.5.5. SITE ANALYSIS

Figure 4.39 shows a schematic isometric view of the site showing the slope directions, the location of the Bosomtwi river, existing buildings on site, access into the site as well as views into the site.

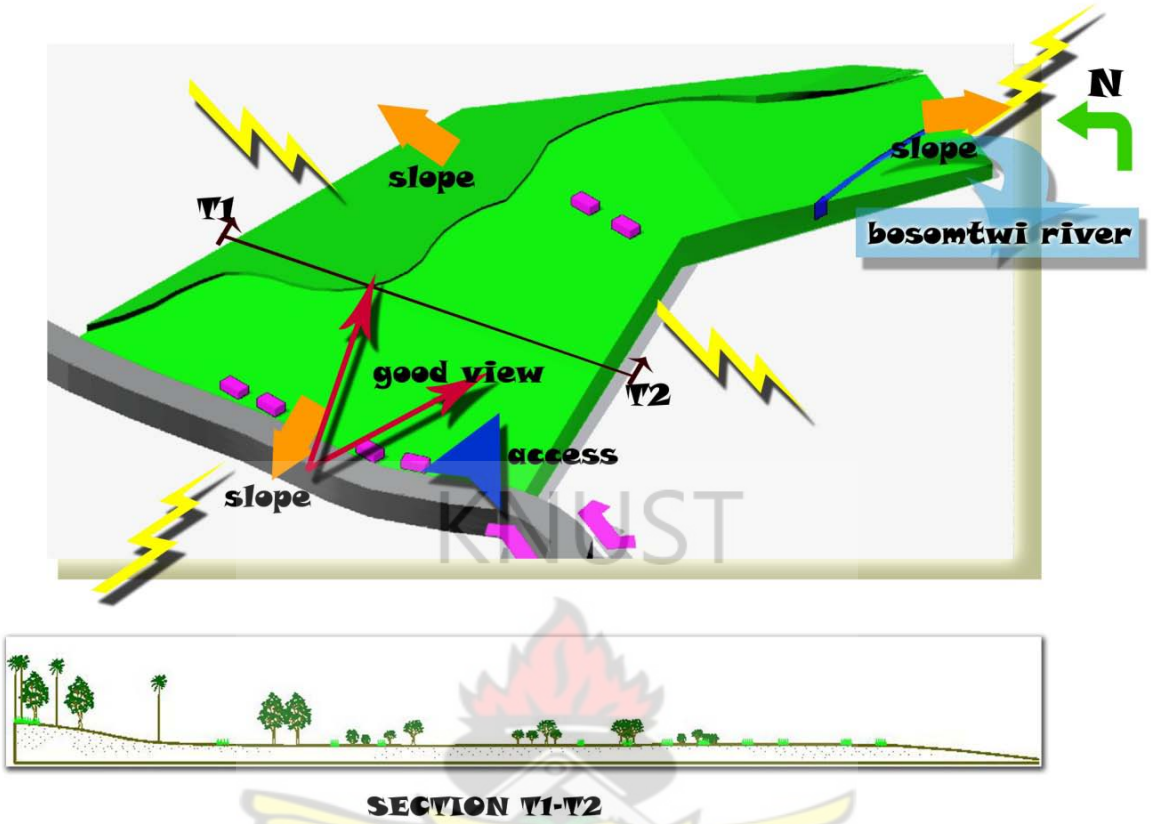

Figure 4.39: Schematic isometric and section of site and surrounding features

4.5.5.1 CLIMATIC CONDITIONS

The site lies in a north-south orientation. The rainfall recorded for the area is between 110mm-250mm per annum and the temperature recorded is also 260ºC-270ºC. The predominant wind direction is south-west. There are two rainy seasons which occurs from April to July and from September to November. The harmattan, a dry desert wind, blows from the northeast from December to March but is felt more in January, lowering the humidity and creating hot days and cool nights. The highest temperatures occur in March, the lowest in August (Ghanaweb, 2010)

4.5.5.2 ADVANTAGES AND DISADVANTAGES OF THE SELECTED SITE.

Due to the fact that the site is located out of the regional capital, there is less traffic from hospice vehicles, resulting in a peaceful environment necessary for the design of a hospice.

The site is near a 2nd class road making the access to the site easy. Since the gradient of the site is gentle, pedestrian and wheel chair access is easy. Electricity is readily available on site. The Bosomtwi (Bosotwi) river is also on site. There is no noise from other parts of the site. The sound of the Akwa falls nearby can be soothing to patients. The mountains on the west boundary will enhance the design concept of bringing the outdoors in and creating rooms outside with landscaping. There are good clear views from outside unto the site.

The soil predominant in the site is lateritic. There is also sandy and slightly stony soil in some areas. Therefore, special plants and flowers appropriate for the soil such as flowering dogwood will have to be used. Well defined pathways will have to be designed and constructed around the site for inhabitants near the location. There is currently no drainage on site from storm water. Noise pollution from drinking bar near the site might be a problem due to loud music and the occasional drunken brawls.

In conclusion, drains will fall along slopes, channelling storm water into the river on site. Usage of sun shading devices on east and west facades will aid in comfortable interior spaces. There will also be the strict use of the north-south orientation.

4.5.6 THE DESIGN PHILOSOPHY AND CONCEPT

In this section, there will be a discussion on the design philosophy, concepts, functional relationship and conceptual site planning.

4.5.6.1 DESIGN PHILOSOPHY

The philosophy behind the design is: A happy life consists in tranquillity of mind (Marcus Tullius Cicero, 43BC).

This famous quote applies to the philosophy for this scheme. It is my belief that being content and happy at the end of one's life is of prime importance and should be achieved one way or another. Dying with a smile in ones heart and on the lips is fulfilling not only for the person but for those surrounding him. Having the peace of mind creates this joy that can be confounding at times to others who have never felt this.

Marcus Tullius Cicero (January 3, 106 BC – December 7, 43 BC) was a Roman statesman, lawyer, political theorist, and philosopher. Cicero is widely considered one of Rome's greatest orators and prose stylists. He is generally perceived to be one of the most versatile minds of ancient Rome. He introduced the Romans to the chief schools of Greek philosophy and created a Latin philosophical vocabulary, distinguishing himself as a linguist, translator, and philosopher. An impressive orator and successful lawyer, Cicero probably thought his political career was his most important achievement. Today, he is appreciated primarily for his humanism, philosophical and political writings (Encarta, 2006).

Cicero had a lot of quotes concerning life, the above mentioned saying being one of them.
According to the online dictionary, tranquility means;

1. Disposition free from stress or emotion
2. Untroubled state; free from disturbances
3. State of peace and quiet

Synonyms of tranquility include repose, quietness, quietude, placidity, serenity. Tranquility therefore can only be achieved when a happy life is achieved.
A hospice is a place for a quiet retreat and eventually departure place for the terminally ill thus is a place to be cared for not cured. A hospice should be peaceful purifying place for the patient's family as well as the staff.

4.5.6.2 CONCEPTS

There are different concepts used in this design. With the layout, there was a smooth flow of activities through various spaces, simple and clearly demarcated layout and incorporates nature in and around the buildings. For the interior, the spatial and furniture arrangement further enhanced the concept of inhibited circulation through the spaces. The colour, lighting, scale, treatment of the spaces, and finishes also depicted the concept of lightness within the spaces. For the exterior, the use of hard and soft landscaping, water features, good façade treatment, sounds from birds and water, the wind and rustling leaves will all aid in the design.

4.5.6.3 FUNCTIONAL RELATIONSHIP

Charts 1 and 2 (Appendix 3) show the functional relationship between the spaces. This helps in the smooth and effective transition between the interior and exterior spaces.

4.5.6.4 MERITS AND DEMERITS OF THE CONCEPTUAL SITE PLANNING

The merits for option 1- alternative as shown in Figure 4.40 are the provision of separate accesses for staff, services, and the main entrance. The general area is clearly visible. The staff and patient accommodation are exposed to views to the mountains on the west. There are separate car parking areas for the staff and visitors. The healing gardens have been located near the river. The demerits on the other hand are the East-west orientation. The car park does not have any views to the mountains, the staff accommodation is not located near service area and the car park can be used as a thoroughfare.

Figure 4.40: Option 1 alternative one

Figure 4.41: Option 1 alternative 2

The merits for Option 1- alternative 2 (Figure 4.41) is that, the administration and general area are closer, the recreational area is closer to patients' accommodation and the healing gardens are near the river. The car park however is a thoroughfare, making it a demerit.

For option 2 (selected), the accommodation spaces have been located near healing gardens, thus giving easy access and view of the gardens and water. The healing gardens have also been located near the river, enhancing the atmosphere there. Parking is exclusive and is not a thoroughfare. The staff and service access clearly demarcated and the main facility centralized. As a result of this new layout, the view to mountains is only limited to the rooms on the west. The staff accommodation might not get good view to the mountains if the area on the west is not treated well as illustrated in Figures 4.42 and 4.43.

Figure 4.42: Option 2

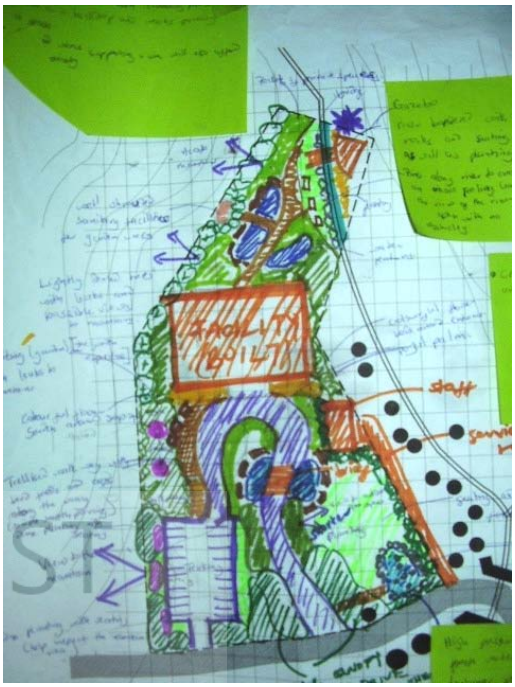

Figure 4.43: Detailed option 2

Legend for option 2

1--- Patients accommodation

2--- Main facility

3--- Car parking

4--- Staff accommodation

5--- Gardens

4.6 GENERAL OVERVIEW OF THE PROPOSED HOSPICE DESIGN

To achieve an efficient, effective, comfortable and aesthetically pleasing design, designers have to be careful about how and where to place elements of the programmes or locate certain spaces, in order to communicate positively to their users and clients. Based on the fact that everyone's environment affects him or her either positively or negatively, good design of spaces is required.

As this facility is not just only a health facility but one that deals with people who are terminally ill, a holistic environment needs to be created so as to help not only them but also the staff, families, and anyone who enters the facility. The space is designed to be a transforming space; one that is spiritual, psychological and physical.

According to research, a transforming space should:

- Liberate and relieve,
- Vitalize and activate and
- Be inviting and comfortable (Fengshui, 2001)

In short, it should serve the purpose of inner healing for which it was designed.

It cannot be overemphasized that a facility such as a hospice should promote meditation. This is because at the end of one's life, it is necessary to understand and appreciate nature and be in tune with God and with ourselves. We all have to really get into some quiet mood to really see and receive from our creator. In achieving the above ideal, the general design project involved the arrangement and positioning of the spaces within close proximity to related spaces or remote from unrelated spaces. Consideration was also given to the circulation, accesses and general views to and from the site. It should also be noted that architecture is art thus, the design has to bring some meaning and delight into the spaces created by the use of design principles and elements such as space, colour, outdoor and open areas etcetera.

A patient upon entering the facility goes through a maze of water features interwoven with greenery right from the main entrance of the facility through to the healing gardens. Patients can tend to their private courtyard gardens which serve as a therapeutic healing method in the facility.

4.6.1 THE ORIENTATION OF THE DESIGN

The facility has been aligned and orientated to minimize the glare of the sun and maximize the amount of diffused lighting into the spaces. Due to the north-south orientation of the

buildings, it also maximizes interesting views and permits the best of prevalent wind for cross ventilation to create the desired comfort levels indoors.

4.6.2 NATURAL VENTILATION

The use of courtyards, large operable windows to facilitate cross ventilation, aids in the adequate ventilation of the spaces especially the residential areas. The direction (south-west and north-east) and speed of air flow which determines the cooling effect of natural ventilation has been exploited very well by the structure and form employed. This is possible due to the fact that the openings of the habitable areas were placed on the north- south elevations of the buildings.

4.6.3 BLOCK PLAN

The facility occupies about 40% of the site and the other 60% for landscape which includes, open pavilions, healing gardens and courtyards and future development. The soft landscaped part of the site provides the ideal setting for natural therapy and can also be used to create a serene and warm atmosphere. The area of the site used for the facility is about 2380 square metres.

4.6.4 STRUCTURE / FORM OF DESIGN

The structural system employed here is the load bearing post and beam system. The varying building heights also promote good ventilation and gives good views. The amount of solar heat received by the surface of the structure has been minimized by the thoughtful manipulation of the following:

1. Shape and orientation of the building plan with respect to the path of the sun.
2. The parts of the building exposed to the sun
3. Shape and pitch of the roof.

Due to the intense solar condition, most of the spaces, especially the administration has been orientated to face the north and south to reduce the heat build-up and unwanted solar ingress. The western and eastern areas have been well planned by locating spaces like the sanitary areas there. Some of the facades were protected by the use of sun shading devices. The square forms with the courtyards, took precedence over circular shapes even though they do relieve stress according to Feng shui which affirmed its usage in health buildings.

As wheelchairs and gurneys are the main means of transportation of patients through the facility, there is the need for straight internal routes with a few curvilinear routes. The use of arc-tangents in some corners eliminates sharp corners without necessarily introducing circles.

4.6.5 ELEVATIONS

The elevations illustrated in Appendix 5 are simple and elegant. This was made possible by the use of a blend of simple double and mono-pitched roofs as well as Dutch gables, to create an interesting residential skyline. Pergolas are used as roofing for all the courtyards and private gardens as well as the gazebos or open pavilions on the river. This is to create a semi outdoor effect through the whole facility. (Appendix 5)

4.6.6 MATERIALS

Interior finishes and treatment are among the important considerations to make in a hospice design and construction. Below are the various areas and the finishes used to aid make the hospice a well designed facility.

4.6.6.1 FLOORS

Floors are probably the most critical finish of a hospice facility. They are subject to constant use and maintenance is needed due to the use of wheelchairs and gurneys. Materials that had wearing surface durability, joints (in seams and at wall intersections), slip resistance, urine resistance, stain resistance, scratch resistance, comfort underfoot, reparability, life cycle,

colour selection, substrate requirements, and clean ability were used. This was in the form of in-situ terrazzo floor finish for the wet areas because they deliver good performance at a reasonable cost. Unpolished porcelain tiles were also used because of their high performance and easy maintenance.

4.6.6.2 WALLS

Another deciding factor for the application of materials was the location of the space. Western and eastern walls which are subject to the harshest of the sun's rays have been coated with materials that release heat such as stone and bricks to help in the cooling of the interior spaces. As a measure to generally make the space and environment lively, walls have also been rendered as information or intelligent walls by the use of murals and simple wall signage.

The least expensive and easiest to apply wall finish is paint. Paint finishes range from acrylic latex and enamel to epoxy. Paints have the added advantage of being easily repaired or changed in colour. This has been used for the other areas which have not been rendered in brick or stone.

4.6.6.3 CEILINGS

The ceilings in the hospice should be lightly coloured to add to the beautiful luminance of the space. Gypsum board ceilings provide a hard, durable, paintable surface. While they block sound, gypsum boards reverberate and amplify sound within the room. Acoustical tile ceilings are suspended in a metal grid hung by wires from the building structure. They are typically available in 2 x 2 or 2 x 4 panels 5/8 or 3/4 inches thick on the market. Their advantages are sound absorbency and accessibility of service pipes above the ceiling by removing any tile. Mineral fibre tiles were used for the counselling rooms. Their strongest disadvantages are moisture absorption and brittleness.

4.6.6.4 FURNITURE

Plastic laminate or wood (good quality) pre-manufactured with wide selection of styles were used for the cabinetry. For seating, wood/plastic laminates was wall hung. Plastic chairs were used for areas that have multi activities for changeability of space.

4.6.6.5 DRAINAGE

Polymer concrete; prefabricated sections with grate pre-sloped was used for the drainage because it is easily cleaned and maintained.

4.6.6.6 NOISE AND ODOUR

To keep noise from, for instance televisions in the various rooms from bouncing off walls, products with high noise-reduction coefficient ratings were used. These include Mylar -faced acoustic ceiling tiles, Mylar-faced sound baffles, and sound-absorbing fabric-wrapped wall panels. Solid-core wood and hollow metal door were used because; they absorb more sound than a hollow-core wood door. Weather-stripping was installed around the doors to avoid transmission of sound.

4.6.7 SERVICES

The services of the proposed hospice design are discussed below. The discussion concentrates on water and electricity and sewage.

4.6.7.1 WATER AND ELECTRICITY

Electricity has been provided from the mains, which run along the main street. Water from the boreholes will have to be treated and pumped to serve the facility. Minimum amount of air conditioning has been used at the administrative area. Service ducts for rainwater have been provided through fins. Waste bins have been neatly provided at vantage points to keep the hospice clean. Points for extra installations of sockets have been made available at several points in the design to make it an efficient one.

4.6.7.2 SEWERAGE

Waste and effluent from the sanitary areas will be channelled into a bio-digester with a soak away. It does not require any dislodging. The space required for the bio-digester is also 20 times less than the septic tank (AIDG, 2010)

4.6.7 COURTYARDS AND LANDSCAPING

Emphasis was placed on the use of courtyards in the design to aid the ventilation of the internal spaces, create meeting places for both adults and children to meet and interact, and create semi-private and private areas for the patients. The design makes extensive use of landscape elements such as fountains, ponds, rockeries and statuaries, greenery and pavers. This is due to the fact that a serene and environmentally interactive space is needed in such a hospice facility to enhance peaceful and tranquil experience of patients and their families. The main entrance to the facility is shrouded with heavily shaded trees. To the right of the entrance is a high pressure pumped rock waterfalls with stepping stones leading to it. This enhances the senses of the users with its gushing sound and leads people to the water features in the facility and eventually the river in the healing gardens. Brick paved walkways lead to the waterfall from the staff accommodation and the main drive way. These are illustrated in Appendix 5.

The driveway is in a curvilinear shape to help create different and interesting views of the facility. This is further enhanced by an arched bridge over a duck pond with rocks and some seating. The drive way is lined with a gradation (various heights arranged in order of height) of trees which eventually leads one to the drop-off zone created in front of the main building in the facility. This has been achieved by creating some seating along the car park with focal views to the peaceful sight of the mountains to the west of the site. The walk from the car park into the facility is interspersed with fountains and trellised covered walkways with bird feeders and seating along it for rest and contemplation.

Meditation gardens are located along the main walk-way within the main facility, create the feel of walking through greenery. Part of the restaurant sits on water with a rock feature attached to it. The residential enquiries hut is also built on water.

The residential part of the facility extensively utilizes courtyards and a private garden which contains sculptures, bird feeds, fountains, potted plants, artificial and natural flowers and grass. The staff lounge has a courtyard with some planters and a fountain as well. This helps the staff to be revitalized during their breaks and staff meetings before going back to work as shown in Appendix 5.

The counselling rooms surround an indoor garden, creating a peaceful relaxing mood which in turn helps with effective counselling. The physical therapy area has an outdoor therapy area, shaded with pergolas and screened with perforated wooden screens with water fountains to create a calm atmosphere for the therapies. The healing garden which is located on the northern part of the site consists of the water-side and the green garden-side. This creates a kaleidoscope of experiences at every point in time for the users.

The river has also been enlarged, bridged and has gazebos/open air pavilions on stilts built on it for the patients who are still mobile to enjoy the water without necessarily getting in.

Greenery in terms of grass, shrubbery and trees has been used extensively in the design to direct circulation, screen views, create privacy, serenity and quiet zones, modify climate and generally add to the aesthetic appeal of the facility. Trees with rustling leaves are used for sound effect and berry plants to attract birds into the facility as illustrated in Appendix 5.

The use of water in the design is also to modify climate, soothe, calm and rejuvenate users of the facility and to generally add to the aesthetic appeal of the facility. The types of water features used are sheet fountain, still waters, gushing waters, flowing waters and fountains with wide and small bells. Some good amount of sun shading from the western sun has been achieved with the ornamental and shady tress as shown in Appendix 5.

Plants that will be used include Ficus benjamina (yellow and green leaves) for ornamental and screening purposes, Eucharia (all green trees) also for ornamental and wind break purposes, Yellow duranta (yellow and green leaves) to define walkways and for aesthetics purposes and Royal palm for ornamental purposes. Plants that serve as pest deterrents were also used. They are fennel, nasturtiums dill which repels aphids, coriander, onion, dandelion which repels flea beetle and African and French marigolds, chrysanthemums which repels Nematodes (Feng shui, 2006).

On the other hand, plants which were used to attract beneficial predators are celery, chamomile, and sunflowers which attracts wasps; fennel, solidago, ivy which attracts Hoverflies and Stinging nettles, tansy, yarrow which attracts Ladybirds.

Plants used for visual impact in the design include flowers such as camellia, magnolia, orchid, peony, forsythia. Trees with colourful leaves such as weeping willow, maple, palm, privet were also used. The lawns will be planted and covered with paspolon grass; carpet grass and some artificial grass were needed.

4.7 PHASING, COSTING AND ENVIRONMENTAL IMPACT ASSESMENT.

The discussion below concentrated on the details on how the project was phased, cost calculated and the analysis on the environmental.

4.7.1 PHASING

The whole project has been phased into five main stages, for the sake of costing and architectural expediency. These are as follows:

Phase 1: The construction of one residential block with meditation gardens, 1 staff accommodation block and the main facility. Provision of services such as electricity and water will be done at this stage. The car park, service access, main access and walkways shall also be done at this stage. Planting of trees will be done at this stage in order for the gardens to be ready by the end of the completion of the facility. This will enable the facility to start to serve the public within one year from the beginning of its construction. This will help to generate some funds for the completion of the other phases.

Phase 2: The children's block will be constructed after phase 1 so as to start serving families with their children in need of the hospice care. The construction of artificial water features will also started during this phase.

Phase 3: The construction of the other two patient blocks.

Phase 4: The staff accommodation will be completed in order to take in the maximum number of about 80 patients the facility is designed for.

Phase 5: All the artificial external water features, gardens and services are to be completed at this stage.

4.7.2 COSTING

The total construction shall be an estimated sum of 600,000 Ghana cedis. This is based upon the cost per unit area calculation of 500- 600 Ghana cedis per 1m2 of floor area currently on the market.

4.7.3 ENVIRONMENT IMPACT ASSESSMENT

The environmental impact of the hospice in the locality will be assessed base on construction and project/program and can be both positive and negative. Air pollution would be caused by

dust during the construction stage through site clearance, excavation works, delivery and use of cement and aggregates. Since the design concentrates on utilizing a lot of soft landscaping, clearing of vegetation cover and removal of topsoil during site preparation will be minimal. As a result, degradation of plant cover and the destruction of the natural habitat of fauna on site will be very minimal.

CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS FROM DESIGN

Hospice care is gradually seeping its way into countries all over the world including developing countries like Ghana. The introduction of the concept, although new will definitely be accepted in time due to the influence of the western culture in Ghana. Creating an environment that is soothing and calming to all users is of prime importance. This research work has contributed to the built-up knowledge of the introduction of hospice designing in Ghana. It has succeeded in proposing an efficient design for the developing countries in the tropics like Ghana. It proposes a design that incorporates courtyards and open spaces to suit the culture and climate of Ghanaians. Nature is interwoven with the built environment through the use of landscaping and open-spaces to create a tapestry of beauty, simplicity and natural healing for the terminally ill and their families.

5.2 RECOMMENDATIONS

To improve upon the solutions addressed in this design, it is important to consider the following recommendations to aid in the design of hospices.

1. The Ministry of Health in Ghana is to use the proposed hospice design as a prototype design to for upcoming hospice facilities in Ghana.
2. Other West African countries in the tropics can adjust the design to suit their culture.
3. Outdoor rooms and outdoor landscapes can be created through the use of greenery, water and courtyards in health facilities such as hospitals.
4. Designers must consider introducing quiet places to sit and contemplate within health facilities. Views must be provided from windows for patients who cannot go outside so they can feel the outdoors.

5. Designers are advised to use design elements that appeal to all the senses of the patients.

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APPENDICES

APPENDIX ONE

SECTION 1.1 DEVELOPED BRIEF

Below is the final design brief used in the proposed Hospice design. It is divided into four main headings which are the hospitality, administration, tranquillity and inner healing and services.

HOSPITALITY

- Family apartments
    - Patient's bedroom
    - Guest bedroom
    - Patients sanitary
    - Guest sanitary
    - Kitchenette
    - Family lounge
- Family rooms
    - Patient's bedroom
    - Guest bedroom
    - Patients sanitary
    - Guest sanitary
    - Kitchenette
    - courtyard
- Two in a room
- Children's room
- Staff accommodation
    - Bedrooms
    - Sanitary
    - Kitchenette
    - Living/dining area
- Reception gift shop
- Saloon
- General living area

- General dining area

ADMINISTRATION

- Doctors' office
- Conference room
- Bursary
- Secretary's office
- Matron's office
- Administrator's office
- Jumble room
- Staff lounge and dining
- Staff training room
- Nurses stations

TRANQUILLITY AND INNER HEALING

- Multi sensory room
- Counselling rooms
- Treatment and therapy rooms
- Dispensary
- Physiotherapy room
- Quiet area/room
- Healing gardens
- Outdoor children's play area
- Water features
- Bird sanctuaries
- Butterfly sanctuaries

SERVICES

- Laundry
    - Clean area
    - Dirty area
- Corpse/departure lounge

- Storerooms
- Kitchen
- Janitor's room
- Generator/plant room
- Sluice room
- Waste disposal area
- Water tanks

SECTION 1.2 ACCOMMODATION SCHEDULE

HOSPITALITY

- Family apartments

Patient's bedroom	12m2
Guest bedroom	16m2
Patients sanitary	5m2
Guest sanitary	3m2
Kitchenette	16m2
Family lounge	4m2

- Family rooms

Patient's bedroom	12m2
Guest bedroom	9m2
Patients sanitary	5m2
Guest sanitary	20m2
Kitchenette	4m2
Courtyard	20m2
Two in a room	3m2
Children's room	10m2
Staff accommodation	12m2

- Ancilliary spaces

Reception gift shop	10m2
Saloon	8m2
General living area	30m2
General dining area	25m2
Games/hobby area	25m2

ADMINISTRATION

Doctors' office	18m2
Conference room	20m2
Bursary	9m2
Secretary's office	6m2
Matron's office	10m2
Administrator's office	12m2
Jumble room	12m2
Staff lounge and dining	30m2
Staff training room	25m2
Nurses stations	4m2

TRANQUILLITY AND NATURAL HEALING

Multi sensory room	30m2
Counselling rooms	25m2
Therapy rooms	12m2
Dispensary	9m2
Physiotherapy room	25m2
Quiet area/room	20m2
Healing gardens	
Outdoor children's play area	16m2

Water features	
Walkways	
Visitors' car park	360m2
Staff car park	180m2
Service yard	12m2
Drop-off zone	36m2
Bird sanctuaries	
Butterfly sanctuaries	

SERVICES

Laundry	16m2
Clean area	4m2
Dirty area	4m2
Corpse/departure lounge	20m2
Storerooms	6m2
Kitchen	30m2
Janitor's room	9m2
Generator/plant room	12m2
Sluice room	16m2
Waste disposal area	3m2
Water tanks	5m2

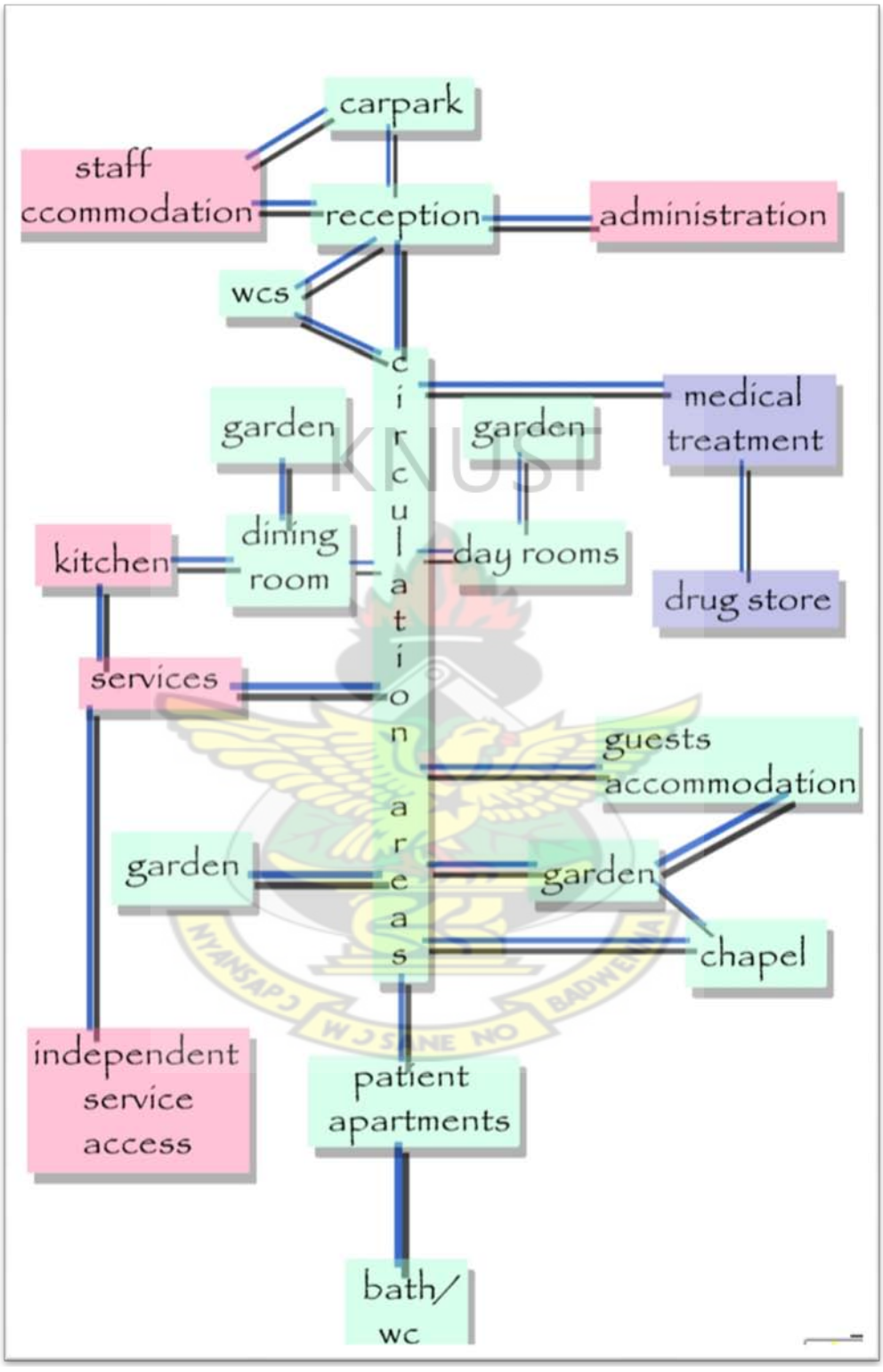
APPENDIX TWO, TABLE 1

Parking standards for classes of Hospice facilities (Planning Policy Guidance, UK (2001)

Use Class	*Description*	*Non- Operational Parking Space*	*Operational Parking Space*	*Cycle Parking Space*
CLASS C3 ***Residential institutions***	Hospital or nursing home	1 space per doctor or consultant 1 space per nursing and ancillary staff 1 space per 3 beds 4 spaces per outpatient consulting room	Operational parking for ambulance and service must be provided and depends on the type and needs of the facility	1 per 10 staff
	Sheltered accommodation for the aged or people with disabilities	1 space per 3 ancillary and nursing staff 0.25 -0.5 per bed greater where particular parking difficulty is experienced Where no communal normal living standards are involved normal residential standards apply	Minimum of 1 lorry/ ambulance space	1 per 10 staff

APPENDIX THREE

Appendix 3, Figure 1: General functional relationship diagram in hospices



Appendix 3, Figure 2: The functional relationship according to design scheme

APPENDIX FOUR

THE GRAPHICAL REPRESENTATION OF THE PROPOSED HOSPICE DESIGN.

Below are rendered three dimensional views of both the exterior and interior views of the proposed design. Appendix four, figures 1 and 2 shows the main hospice building from the entrance. Appendix four, figures 3 and 4 shows the interior views of the main facility. Appendix four figure 5, 6 and 7 shows typical patients' accommodation. Appendix four, figure 8 shows a typical therapy room. Appendix four, figure 9 shows the children's hut. Appendix four, figure 10 shows the healing gardens and Appendix four, figure 11 shows the staff accommodation.

Appendix four, Figure.1: general over view

Appendix four, Figure 2: 3-d impression of main facility

Appendix four, Figure 3: reception / courtyard

Appendix four, Figure 4: Dining and lounge

Appendix four, Figure 5: Patient's accommodation

Appendix four, Figure 6: Courtyard of patient's accommodation

Appendix four, Figure 7: A typical patient's room.

Appendix four, Figure 8: Brown therapy room

Appendix four, Figure 9: Children's huts

Appendix four, Figure 10: Open air gazebos (healing garden)

Appendix four, Figure 11: staff accommodation

APPENDIX FIVE
THE GRAPHICAL REPRESENTATION OF THE PROPOSED HOSPICE DESIGN (THE VARIOUS PLANS, ELEVATIONS, SECTIONS AND DETAILS)

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