DESIGN OF A MORTUARY FACILITY.
This thesis is my original work and has not been presented in any other university or institution for the purpose of awarding a degree to the best of my knowledge. This thesis is submitted in partial fulfilment of the examination requirements for the award of the bachelor of architecture degree, in the Department of Architecture and Building Science at the University of Nairobi.

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Though only my name appears on the cover of this study, I owe my gratitude to many people who have contributed to its production.

Foremost, I would like to express my sincere gratitude to Almighty God for the good health and wellbeing that was necessary to push me through the six years coursework of studying architecture.

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To all my friends and acquaintances outside campus who directly or indirectly have lent their hand in this venture am so grateful.
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I also dedicate this thesis to all the mortuary staff for your strength and immeasurable support in ensuring the deceased are well kept. My hope is that with time, conscious and dedicated designs of mortuary facilities will be fostered in providing you a good work environment.
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CHAPTER 1: INTRODUCTION
1.0 Introduction

Many years ago, people and the society in general did not care so much about dying individuals, thus there was no dignity accorded to them. They were perceived as ‘unclean’ and so they were taken far away from their homesteads and left there to face the fate of death. With time, people learnt the need to have a proper send off for the deceased as a way of showing love and respect. Accommodating them in their living spaces as proper funeral arrangements were made was an important aspect of showing that they were highly valued by their families. It was the sole responsibility of the family members to take care of the deceased body until its final disposal.

A mortuary facility was later developed in order to cater for the needs of the deceased. With the involvement of health professionals and use of modern technology, better ways of preserving dead bodies have been established. This has allowed the bereaved to keep the deceased bodies in a secure place for a longer period of time as appropriate funeral arrangements are made. In the mortuary, it is solely the responsibility of the morticians to take care of these dead bodies.

The mortuary occupies a special place in the society. Its role in the grieving process cannot be overlooked. By being within its environs, the bereaved take the first step towards emotional adjustment to their loss. The type of environment created play an enormous role in the healing process of the bereaved. It is also an environment that bring together people who have not met for a long period of time to mourn their loss.

The facility has a dual role; it serves both the living (the staff and mourners) and the dead. This study seeks to investigate how the needs of these users impact on the design of a mortuary facility. It is crucial for the design team to understand the type of spaces that should be provided and their respective functions. Other aspects such as: the choice of site, circulation, choice of building materials, waste handling and management, contribution of landscaping to the overall aesthetics of a building, lighting and ventilation are important when designing such a facility so as to ensure the needs of all its users are met.

A clear understanding on how a mortuary operates will lead to provision functional spaces that will be environmentally viable and socially accepted by the staff and general public. Within the urban context, funeral homes have gained popularity and great acceptance as compared to the rural areas. They are viewed as business opportunity just like any other commercial activity. This is evident by the many privately owned mortuaries that are being developed in the country. (Fig. 1-1 and Fig. 1-2) show the modern types of mortuary facilities within Nairobi.
1.1 Background of study

According to world health statistics provided by WHO (2009) HIV/AIDS is the leading cause of deaths in Sub-Saharan Africa. In Kenya it accounts for 29.3% of the deaths experienced in the country. Infectious diseases and cardiovascular diseases accounts for 20%. The Kenya Network of Cancer Organization established that cancer is the third highest cause of morbidity nationally, and it accounts for 10% of deaths per year. (Fig. 1-3) show the major type of diseases that causes death in Kenya. Other major causes of deaths includes road accidents, domestic violence, suicide, fire, natural calamities and terror attacks.

Nairobi is the capital city of Kenya. It has witnessed tremendous increase in population since independence mainly due to rural-urban migration. In these vast population death is inevitable as many people die daily due to the causes listed above. In order to deal with the deaths encountered daily, the government and other private investors have invested in establishment of mortuary facilities. According to Kihara (2013), Nairobi County has 30 mortuaries; government and privately owned mortuaries. Each of these mortuaries have a minimum capacity of 50 body storage spaces. The ones under the government are either public (independent) or either attached to a government hospital or a government learning institution. (Fig.1-4) show a few of the mortuaries located in Nairobi.

A survey by Lordrick (2013) indicate that there is an increase flow of dead bodies to the government mortuaries as compared those that are privately owned. This is because they have a higher body holding capacity and also their services are relatively cheap as a result they attract a larger population in Nairobi. These has resulted in congestion of public mortuaries for example City Mortuary. The author found out that at least 15 deaths are recorded daily in Kenyatta National hospital and these bodies are taken to Kenyatta hospital mortuary which only caters for deaths that occurs within the hospital premises. According to Nairobi County statistics (2013 and 2014), in a year city mortuary received 4,895 bodies; 3,235 from the police and 1,660 from other citizens.

The number of deaths recorded in a year in Nairobi County does not match the body capacity of its mortuaries. These facilities are faced with various challenges mentioned in the problem statement of this thesis.

<table>
<thead>
<tr>
<th>Rank</th>
<th>Disease or injury</th>
<th>% total deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>HIV/AIDS</td>
<td>29.3</td>
</tr>
<tr>
<td>2</td>
<td>Conditions arising during perinatal period</td>
<td>9.0</td>
</tr>
<tr>
<td>3</td>
<td>Lower respiratory infections</td>
<td>8.1</td>
</tr>
<tr>
<td>4</td>
<td>Tuberculosis</td>
<td>6.3</td>
</tr>
<tr>
<td>5</td>
<td>Diarrhoeal diseases</td>
<td>6.0</td>
</tr>
<tr>
<td>6</td>
<td>Malaria</td>
<td>5.8</td>
</tr>
<tr>
<td>7</td>
<td>Cerebrovascular disease</td>
<td>3.3</td>
</tr>
<tr>
<td>8</td>
<td>Ischemic heart disease</td>
<td>2.8</td>
</tr>
<tr>
<td>9</td>
<td>Road traffic accidents</td>
<td>1.9</td>
</tr>
<tr>
<td>10</td>
<td>Violence</td>
<td>1.6</td>
</tr>
</tbody>
</table>

Figure 1-3: Table showing the main diseases causing death in Kenya.

City mortuary
Chiromo funeral parlour
Kenyatta hospital mortuary
Umash funeral home
Montezuma Monalisa funeral home
Pumwani hospital mortuary
Mbagathi hospital mortuary
Lee funeral home

Source: Author, 2016.
1.2 Problem statement

A mortuary facility has three main users; the deceased, the staff and the bereaved who need very well thought out solutions in the design of their spaces. It is essential for the architect to understand the needs of these users, the spaces they require and the functions of each space so as to ensure they are all provided for in the design without making any compromise. Provisions should be made to ensure the bereaved and the deceased are separated and only meet at the recommended spaces. The design should ideally address vital issues such as: choice of site, circulation, privacy, security, assessment of scale of provision, lighting, ventilation, choice of materials, waste management and provision of open spaces and gardens from the conceptual design. Additionally, being a health facility, it is expected to conform to health and safety measures as spelled out in Occupational Safety and Health Act (2007).

A casual observation made from the visits to the mortuaries in Nairobi show that their designs are not fully responsive to the issues mentioned above. Their deficiencies in design especially on issues of functionality is indicated by failures in spatial planning. Conflict in circulation is evident in Kenyatta Hospital Mortuary and City Mortuary (Fig. 1-5). In both, the staff, mourners, body delivery and body collection points are serviced by one entry. Other apparent issues includes inadequacy in provision of privacy, poor choice of materials used in the interior spaces, inadequate body storage spaces and absence of waiting areas for the bereaved. The author also noted that some spaces were poorly lit while in others there are no openings for ventilation. They are characterized by stench smell from the decomposed dead bodies. Consequently, as observed from (Fig. 1-6), little attempts were made in the design of external spaces whereas in Chiromo Funeral Parlour, a larger part of external space is used for parking. This creates a heat island and leaves little space for soft landscaping.

The deficiencies mentioned above pose major problems in the general operation of a mortuary facility. Therefore, this research seeks to investigate the design of mortuaries in Nairobi in relation to their functions and user requirements in a bid to develop a set of guidelines that can be adopted in the design and planning of a mortuary facility.
1.3 Research questions
The questions that were addressed to guide the author through the research process are as follows:
   a) What are the functions of a mortuary? Apart from spatial requirements what other aspects should be considered in the design of a mortuary?
   b) Do the designs of existing mortuary facilities in Nairobi respond to their function?
   c) What are the architectural design guidelines that can be employed in the design of a mortuary facility?

1.4 Objectives of study
From the above questions the following objectives were made:
   a) To examine the functions of a mortuary and ascertain spatial requirements and other important aspects that are considered in the design of a mortuary facility.
   b) To examine and analyze how mortuaries in Nairobi have been designed in relation to their functions.
   c) To develop a selected set of design guidelines that can be used in the design of a mortuary facility.

1.5 Justification of the study
Previous research from the department of architecture and building science at the University of Nairobi have dealt with the architecture of the dead. These researchers documented the cultural and religious rituals performed prior to body disposal. However, the phenomena of the mortuary have not been dealt with. Emphasis has not been put to the general contribution of a mortuary facility in the funeral process.

Therefore, the author saw a need for an in-depth analysis into the design of a mortuary facility, in order to come up with guidelines that will be adopted in its design and planning. This study undertakes a comprehensive analysis of the mortuary facility as it investigates the body handling process. It aims to bring out an understanding of the various space requirements and the relationship they have with each other in the overall functioning of the mortuary.

This analysis provides an insight into the importance of a mortuary facility in the funeral process.
1.6 Significance of study.

As indicated in the background of information, death is a phenomena that will always be there due to the several causes. The overall purpose of a mortuary facility is not only to provide space for dealing with the deceased bodies but also to create reassuring spaces that allow the bereaved and staff to have meaningful experiences within its environs.

The author strongly believes that a mortuary is a place of self-reflection. The architects should show their prowess in creating phenomenology through interplay of various architectural elements. From (Fig. 1-7) it is evident that the choice of material, lighting strategies, flowers, and use of courtyards was a conscious approach by the architect to create a comforting environment for the bereaved.

1.7 Scope and limitations of study.

The study was conducted in Nairobi County. According to Kihara (2013), Nairobi County has 30 mortuaries these include government and privately owned mortuaries. Since each mortuary is unique in its physical location, design and layout of spaces, the study was specific to those that are under the government management. Those under the government include public mortuaries and those attached to either a government hospital or a government learning institution (Fig.1-8).

A critical study of the design and planning of these mortuaries aided proper documentation of various design aspects used as noted by the author.

Limitations

This study was limited to investigating issues within the built environment. These are problems encountered in a mortuary facility that can be solved architecturally. In addition to that, due to limited amount of time and financial constraints the investigation was narrowed down into 3 mortuaries that are directly or indirectly under the government. Mortuary operating hours were also put into consideration as the mortuary staff were busy attending to their clients, therefore data had to be collected when the work load was less.
1.8 Definition of terms
The following are technical terms used in this research and are defined in context of their use:

**Mortuary/funeral home/funeral parlour/funeral facility** - This is a building specifically designed and constructed for caring for the dead.

**Rigor mortis** - Rigidity of the muscles which occurs a few hour after one is pronounced death.

**Deceased/cadaver/corpse/the dead** - One in whom all physical life has ceased.

**Embalm** - The process of preserving a dead body by means of circulating a preservative (embalming fluid) through the veins and arteries.

**Embalming fluid** - Liquid chemical used in preserving a dead body.

**Post-mortem/autopsy** - The process by which a body is dissected in order to investigate internal organs so as to deduce the cause of death.

**Mummification** - This is a process in which the skin and flesh of a corpse can be preserved. The process can occur either naturally, or it can be intentional

**Health hazards** - These are potential source of harm or adverse health effects on people, which causes illness, injuries or any other form of discomfort.
1.9 Structure of study.

Summary of the chapters that will be contained in this study:

Chapter one is an introduction to the research. It give general information for the reader to have a glimpse of the study, its presents the background of study, problem statement objectives, significance and the justification of study.

Chapter two looks at literature written by different authors on the design of mortuaries from published and unpublished documents. It gives the history of preservation techniques, functions of a mortuary and discuss various aspects that are important in the design and planning of a funeral facility.

Chapter three looks into the methods used in obtaining relevant information. It give details on the sources of data, data collection techniques and ways of data analysis and presentation. It also states justification for the chosen methods and how it helped the author obtain relevant information.

Chapter four give the research findings of the fieldwork for the 3 local cases studies: City Mortuary, Kenyatta Hospital Mortuary and Chiromo Funeral Parlour. From the analysis of their designs, the author was able to give their successes and failures.

Chapter five draws the conclusions, gives recommendations and areas for further study.

Figure 1-9 : Structure of the study
Source: Author, 2015.