

DESIGN OF THE BOYS HOSTEL AT KABALE UNIVERSITY

BY

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**A RESEARCH PROJECT REPORT SUBMITTED TO THE DEPARTMENT OF CIVIL &
BUILDING ENGINEERING IN PARTIAL FULFILLMENT TO THE AWARD OF
DIPLOMA IN CIVIL AND BUILDING ENGINEERING KABALE UNIVERSITY**

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DECLARATION

I **NUWAGABA HAPPINESS** hereby declare that this report is of my original presentation of the activities we carried out for the **design of boys hostel at Kabale university** I wrote it and I am myself sure it has never been submitted to any other institution of higher learning for any award.

Signature:

Date.....

APPROVAL

This is to certify that NUWAGABA HAPPINESS a second-year student of Kabale University carried out Design project titled “**design of Boys hostel at kabale university**” under my supervision and it is due ready for submission and examination with my approval.

MR. MUHANGI BRUNO

Signature:

Date:

ACKNOWLEDGEMENT

I would like to thank the almighty God for protecting me throughout this semester despite all the hardships. I would also like to thank my father MR YAFESI SAM my mother KANKORE MAUNDA, my brothers and sisters for the financial support they offered to me and not forgetting their guidance too.

A token of appreciation goes to our project supervisor Mr. Muhangi Bruno for the great support and guidance he offered to us during this semester. I also wish to express my sincere gratitude to the department of civil engineering for allowing us to do group project. I also thank the panelists for being flexible and not for getting their advice and corrections. I also thank my fellow classmate for the support they gave me during the preparation of my report.

ABSTRACT

This documentation is about the design of a two storied hostel at Kabale University. The ideas of this design were obtained from review of architectural textbooks, journals and building review reports.

It also contains how our group intends and will carry out the design process of the hostel.

The writing contains three chapters whereby;

Chapter one is the introduction of the proposal that states the contents of the background of the university, how the problem was identified and why the project of hostel design was chosen ahead of others.

Chapter two contains the literature review, works and related information by other scholars about design of structures.

Chapter three outlines the methodology of how the project will be done; these are sequential methods for the process.

Chapter four discusses the results and project discussions that involves details of the budget, work plan, appendices and reference

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LIST OF ACROYNOMS AND ABBREVIATIONS

BS:	British Standards
FY	Financial Year
UNRA	Uganda National Roads Authority.
EC	Euro Codes
N/A	Not Applicable
DOS	Dean of Students
CBR	California Bearing Ratio
UACE	Uganda Advance Certificate of Education
CML	Central Materials Laboratory.
ASTM	American Society for Testing Materials.

CHAPTER ONE: INTRODUCTION

1.0 Introduction

This chapter contains the background of the projected chosen, problem statement, objectives of the project, and the scope of the project. The project is “Design of a multi-two (2) storied hostel at Kabale university. It will be carefully designed by all the members of this group.

1.1 Background of the project

Kabale University traces its origin way back in 1995 under the umbrella of the Kigali development association as a nonprofit community based organization. It was granted a charter on 29th September 2014. In 2015, Kabale University was transformed from a private entity to a public University under the statutory instrument No. 36 of 16th July 2015. (University and other institution ACT 2001). This the time of initiation, when the university opened its gates to students in 2002, the university has seen a drastic increment in enrollment from 42 to about 3000 students recently (kab.ac.ug).

Kabale University is currently operating in old structures that were donated by KDLG during the period when it was operating as a private institution. Since the government took over from 2016, there is no evidence of any newly constructed hostel facility to accommodate the increasing numbers of students every academic year.

Due to the growing number of the university students, there is also need to increase the capacity of the university infrastructural wise so as to comfortably accommodate the students.

1.2 Statement of the problem

Kabale University currently has 3,193 students on continuing program (By March 2020). The growth of the students is studied to be 20% since 2016/17 academic year.

Basing on the data collected from some of the selected hall wardens and university Estates report, the total square meters of space required for accommodation is 1,581, yet the available is just about 571 square meters. Implying will have a short fall of about 1,051 square meters of space, this evidence justifies the urgent need of this project.

In our visit to the hostels, we found out that, most hostel facilities are in dilapidated conditions some of these conditions include; poor internal security at the hostel, small area ratio of the

hostel rooms, poor sanitation within and around the hostels, lack of common rooms for sports facilities like Dstv, gaming centers and workout gyms.

Irrespective of the conditions of the hostels, he noted that many students are interested in being university residents but limited due to the inadequate capacity of the hostels. He noted that students would like to stay two in a room compared to the current four/ more in a room.

Many students do not perform to their best abilities because of the long distant hostels which are not within the university (non-university hostels), long distant hostels waste a lot of student's time travelling to the University for Lectures, discussions and library services.

Long distant residence is therefore hypothesized to reduce the performance of the students thus there is need to build hostels within the university to curb the challenge. The poor performance can be curbed up to 74% if the required numbers of hostels are built as indicated on the university master plan.

Basing on this above evidence, this group has resolved to design a hostel for the Kabale University.

1.3 Main objective of the project

The main objective of this project is “To design a modern state of art, hostel for Kabale University”.

1.4 Specific objectives of the project

- To carry out the topographic survey for the proposed site.
- To carry out a geotechnical site investigation for the proposed site.
- To generate architectural drawings and architectural model of the proposed facility
- To evaluate the most appropriate structural details to fit the proposed structural system.
- To prepare requirements for the various building services.
- To produce bill of quantities for the proposed works.

1.5 Significance of the project

This project would help in the following when implemented;

- It will add the knowledge of structural and architectural designing to the authors.
- It will reduce the congestion in the current hostels.
- It will be to accommodate more students within the university that will promote collective working within the students.
- It will also generate substantial revenue for the university since many students will be residents of the university halls.
- Increased performance since study groups will be effective, use of study services will at the reach of the students.

1.6 Justification of the project

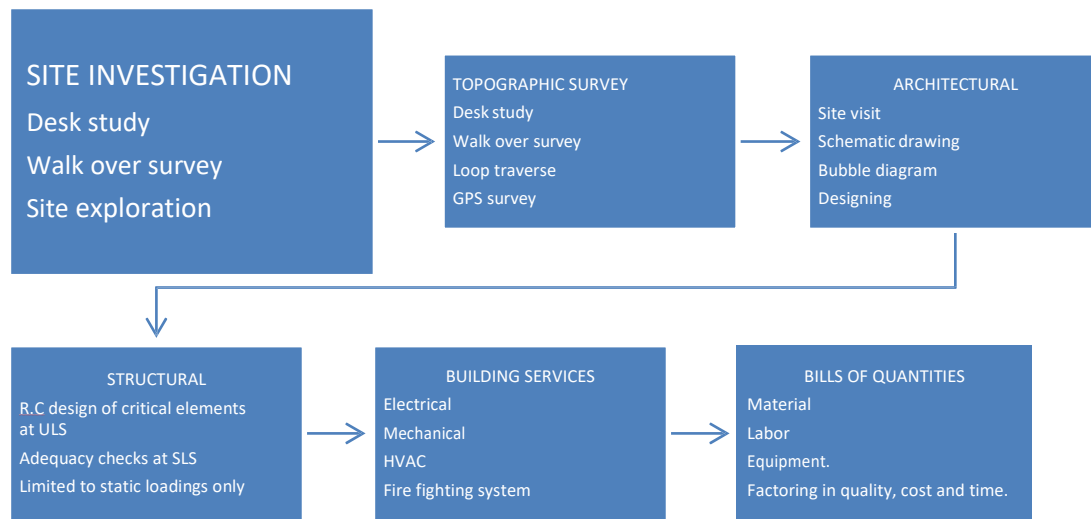
Inadequate capacity and poor conditioned hostels within the university have a great negative impact on both the student's welfare and performance through the following ways;

- Poor security at places of residence outside the campus (Nonresidents)
- Inadequate time for group reading and discussions due to long distant places of residence.
- Limited space at the current hostels that limits personal privacy.
- Increased expenditure on accommodation since private hostels are more expensive than the university hostels.

1.7 Scope of the project

The scope of the study will elaborate the geographical location of the proposed area as per the master plan of the university, the data or information to be collected for the design of the hostel, and the expected duration to complete the design process.

Figure 2: showing project scope



1.7.1 Geographical scope

The proposed site is located at Kabale University (Main campus).

1.7.2 Content scope

The project will involve getting information about the following in broader context of their scope independently, where necessary dependently;

- Of the project cost and it's Surveying of the proposed plot to assess the geographical and surface suitability of the proposed plot for the project.
- Soil tests for the assessment of geotechnical data, all the tests will be done in accordance with the British standards.
- Designs (architectural, structural and services) bases on the current design philosophies.
- Estimation cost benefit analysis to the beneficiaries.

1.7.3 Time scope

The design process for this project is approximated to take **2 months**. Refer to the project schedule on the appendix page.

CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

This section reviews the literature that is available in relationship to design of a hostel. The codes to use, principles to follow and guidelines to use during the design process.

2.1 Theoretical Review

According to structural cross sections, (2017 journal). Design of a structure refers to the process of proportioning the structure to safely resist the applied forces and load effects in the most resource effective and friendly manner.

Chana Kya Arya, design of Structural Elements, third edition page 3, defines design is taken to mean the entire planning process for a new building structure, bridge, tunnel, road, etc., from outline concepts and feasibility studies through mathematical calculations to working drawings which could show every last nut and bolt in the project.

National physical planning and guidelines 2011 edition considers hostels to be commercial building for which it requires that a standard commercial plot should be 15m wide and 30m long and 7.5m wide and 30 m long as the minimum, to accommodate one minimum standard building of 7.5m wide. The depth of 30 m is designed to accommodate a structure of between 10 and 18 m long plus a front canopy and rear space for septic tank and soak pit. Buildings may cover up to three quarters (75%) of the plot area subject to all other standards being met.

Uganda building regulations act of 2005 under section 3.1.1.1 also requires that, a person intending to carry out any building operation shall make a written application to the Committee for approval and shall, with such application submit the following plans, calculations and other particulars as may be required• location plan;

- Site plan
- Architectural layout drawings and details
- Structural drawings, layouts and details, including bar bending schedules and structural calculations
- Water, plumbing and drainage drawings and details
- General arrangement of artificial ventilation

- Electrical or mechanical installation layout details and
- Any other particulars, which the applicant feels, would be of assistance to the Committee.

This section therefore enlightens us to be able to make all the above working drawing as per standards.

Section 3.1.3.2 of the regulations also requires that plans, drawings and diagrams shall be drawn to suitable scales but not smaller than the scales indicated in the following paragraphs•

a) Site Plans:

1:2500 or 1:1250 or 1:1000 or 1:500 or 1:250 or 1:200 or 1:100

b) Drainage installation drawings:

1:200 or 1:100 or 1: 50

c) Layout drawings (including demolition drawings, if any)

1: 100 or 1:50 or 1:20

d) Sections & Elevations:

1:100 or 1:150

e) General structural arrangements and details:

1: 100 or 1:50 or 1:20 or 1:10 or 1:5 or 1:2 or 1:1

2.2 Actual review

In the design process, there are many considerations for example; geotechnical investigations, (Site investigation), surveying and modeling.

Geotechnical investigations are carried for the following purposes;

- To obtain the bearing capacity of the soil and its properties.
- To understand the ground water conditions and its behavior.
- To determine the difficulties that may exist when carrying out the project.
- To find out any existing structures below the ground.

Topographical surveys are carried out and they are a necessity for every project because of the following;

- To clearly show man-made features, physical features of the area that can affect the design of the structure.

- To ascertain the adequacy of the proposed area for a sustainable, occupant and environmentally friendly design of the structure.

All necessary information regarding the subsurface nature should always be taken during design process of structure, to prevent cases of structural failure

2.3 Summary of literature

Basing on the above literature, we shall design the hostel in accordance with the requirements of building regulations, using Euro code design standards and British Standards manuals for material testing. We shall engage in enough research to design a hostel that will comply with the hostel design requirement of Uganda and East Africa if possible.

Based on the relevant literature we believe that a lot needs to be enforced during the design of structures, due to the day to day changes that are occurring in the climate. Changes like elmino, and also the increasing demands for buildings leading change in use of the structure. Structures should therefore be designed with higher factors of safety to ensure adequate working life, they should also be monitored for any deformation during and post contract stages for aspects of safety.

CHAPTER THREE: METHODOLOGY

3.0 Introduction

This chapter covers the stages that will be involved in this project process. It is written about data collection methods for topographical survey, data collection instruments, validity and reliability of data, data analysis, limitations of the project, time schedule, budget and appendix.

3.1 Proposal approval

This proposal shall undergo an approval by the approval body.

3.2 Data for Topographical survey

This will be carried out by the students of the group, we shall use theodolite, Gps and compare our results of the two to conclusively support the outcomes, and this will be a policy for proven reliability of the data collected. It will also let us achieve the objective of learning how to carry out topographical survey.

We shall also produce a topographical survey report.

3.3 Architectural designs

The architectural designs shall include;

- ✓ Floor plans from basement floor up to the third floor
- ✓ Elevations
- ✓ Site plans and site location plan

Theses designs shall be designed to fit in the available area so well in compliance with the housing requirements as well as environmental requirements, the survey report shall help us to locate the building in a suitable part of the proposed area. This design will provide basis for the geotechnical or structural design. The architectural design shall be done using soft wares as auto cad, arch cad and rivet.

3.3 Geotechnical Investigations

The data concerning the soils will be carried out for the earlier on mentioned purpose, needed data will be on done soil samples of disturbed and undisturbed, the information of importance include the following;

- ✓ Soil profile
- ✓ Soil classification
- ✓ Moisture content,
- ✓ Ground water level

3.5 Data collection methods

- Observation method. This is the first raw method of any Engineer before any test concerning physical property identifications.
- Field survey. This method will be used to obtain first-hand information by direct observation.
- Field tests and laboratory tests, some of the data shall be got by carrying out tests on the samples.

3.6 Data collection instruments

- Field tests
- Laboratory tests
- Observation schedule
- Library research from textbooks, journals and building codes

3.6.1 Data analysis and interpretation

All samples collected shall be tested from the university laboratories for the various tests. The results shall be compared with some of the previous data for check of precision and accuracy. Informally, it will be reviewed and critiqued by fellow students, and experts in the similar field including my lecturer. Finally, a model will be made and tested to exhibit the results these will be carried out in a similar way in the final study, and the resulting data will be analyzed

according to the research plan, and adjustments will be made accordingly. All the tests will be carried out following the guidelines set in the CML.

This data shall be processed and presented for consideration during structural design of the hostel.

3.7 Structural Design

The results got from the tests will be used to design the structural frame of the hostel. After all the tests, data like soil strength, ground water level and soil profile will dictate the design or help the designers to logically think of how to improve them to suit the standards, basing on the architectural design, the loads of the hostel (Dead and live) will be calculated in the order of Roof loads, floor dead loads, floor live loads, horizontal loads if necessary, and other

The information about these loads and the geotechnical survey will help to design an adequately strong and economical foundation for the hostel. Confirmation of the structural element sizes will be verified at this level for a structurally stable design. This design will be done using Auto cad, or rivet and checked manually using the learnt design methods.

Our structural designs will be in accordance with EC.

3.8 Other documents and services

Other services like M&E services shall be designed upon successful design of the architectural and structural design.

Upon panels request or Supervisors request other necessary documents shall also be produced.

3.9 Budget

A budget is the list showing estimated expenditures for the project presented as below;

Item no.	Description	Unit	Rate	Amount
1	Preliminary activities	item		
2	Site topographical surveying	item		
3	Architectural designs	item		
4	Geotechnical investigations	item		
5	Consultations	item		
6	Structural design	item		
7	Modeling	item		
8	Contingencies	item		
9	Grand Total	NA		

Source group members

Table1: showing budget

Activity Schedule

Below is the activity schedule for our project process

	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR
DATA COLLECTION								
SITE LOCATION								
SITE SURVEYING								
ARCHITECTURAL DRAWINGS								
GEOTECHNICAL INVESTIGATIONS								
STRUCTURAL ANALYSIS AND DESIGN								
PROJECT PRESENTATION								
REPORT WRITING								



Scheduled time for activity.

Table2: showing activity schedule

References;

- Baccarini, D. P. R., 2007. *The Use of Bills of Quantities in construction projects*. s.l.:s.n.
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- Samriddi, G. A. a. S., 2017.
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Appendices



Figure 2: showing existing hostels



Figure 3: Showing existing hostels



Figure 4: Proposed artistic design the boys' hostel [front view]:



Figure 5: Proposed artistic design the boys' hostel [Side view]:



Figure 6: showing end view of the proposed hostel



Figure 7: Showing location of proposed site in kabala main campus

METHODOLOGY

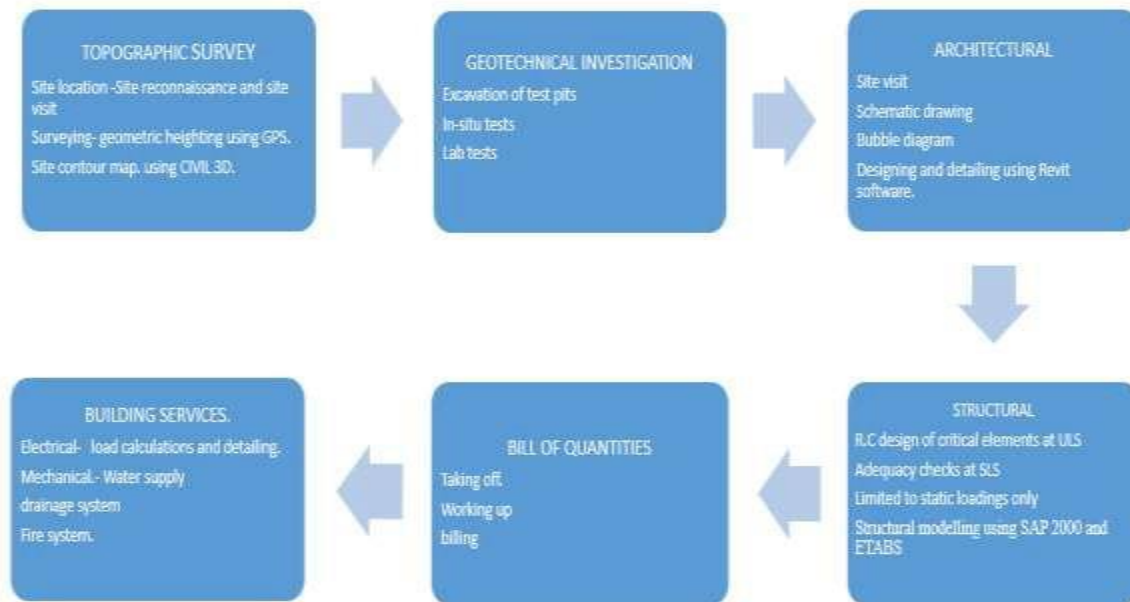


Figure 8: Showing the project scope

