ESTIMATING AND BUDGETING FOR A PROPOSE MEDIUM SCALE B UILDING

(A CASE STUDY OF A PROPOSED HOSPITAL BUILDING FOR THE INSTITUTE OF ENVIRONMENTAL STUDIES, KWARA STA TE POLYTECHNIC ILORIN)

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A RESEARCH PROJECT SUBMITTED TO THE DEPARTMENT OF QUA NTITY SURVEYING, INSTITUTE OF ENVIRONMENTAL STUDIES, (IES) KWARA STATE POLYTECHNIC, ILORIN.

IN PARTIAL REQUIREMENT FULFILLMENT OF THE REQUIREMENT FOR T HE AWARD OF NATIONAL DIPLOMA (ND) IN QUANTITY SURVEYING.

JULY, 2025

CERTIFICATION

This is to certify that this project is original work carried out by the following M atriculation numbers **ND/23/QTS/PT/0012, ND/23/QTS/PT/0013, ND/23/QTS/PT/0 014, ND/23/QTS/PT/0015, ND/23/QTS/PT/0016, ND/23/QTS/PT/0017** of the Depar tment of Quantity Surveying and has been prepared in accordance with regulati on governing the preparation and presentation of the project in Kwara State Pol ytechnic, Ilorin.

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DEDICATION

This project is dedicated to Almighty Allah the father of the whole universe for his prominent grace and favour right from the beginning of this project to the Accomplishment of it.

ACKNOWLEDGEMENTS

All glory is returned to Almighty Allah for his shower of blessing, a nd also for the Gift of knowledge and wisdom utilize in the accomplish ment of this project.

We express our profound gratitude to the desirable and competen t (coordinator) and all lecturers in my department, and non teaching staf f in the department, May almighty God grant your effort in abundantly (Amin).

Our profound gratitude also goes to our enduring and accommoda ting supervisor **QS AZEEZ ALAO.** Who gave lucrative instructions attach ed with enlightening advice and correction when and where necessary f or the accomplishment of this project. Your effort on us is highly apprec iated. May almighty God help us to reward Him (Amen).

Our gratitude goes to our respective and lovely parents for their i mmense contribution toward the accomplishment for this project with g reat emphasis on how caring they have been right from when we step i nto this world. May Almighty God fulfill your dreams and aspirations ove r us (Amen).

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CHAPTER ONE

INTRODUCTION

1:0 BACKGROUND INFORMATION

This project is based on estimating and budgeting for a propose medium scale building.(A case study of a proposed hospital building for the institute of environmental studies, Kwara State Polytechnic, Ilorin.) Kwara State Ilorin is one of the 36 States we have in Nigeria.

Kwara State is located in the northern part of Nigeria. It comprises of sev eral higher institution which include University of Ilorin, Kwara State college of e ducation, Al- Hikmah University, Summit university, Offa Crownhill university, Uni versity of Offa, Lens Polytechnic Offa, The Polythenic Igbo Owu, Graceland Poly technic, Ahman Pategi university, Thomas Adewunmi University, Newland Polyte chnic, Kwara State University, Federal Polytechnic Offa, Landmark University and Kwara State Polytechnic, which serves as our area of concentration in which the proposed hospital will be located.

Due to high development in terms of building construction that is going o n in Kwara State Polytechnic which give room for the erection of a new hospital for Kwara state Polytechnic. In order to care and facilitate and effective workin g condition for the benefit of both lecturer and the student which do not exclud e the institution.

As a result of the above mentioned reason, estimation (I.e taking off, abst

racting, bills,) is to be prepared, which serves as the main objectives of this proj ect because many buildings in Nigeria today have not been completed as a resu lt of improper cost planning.

The design team on consultancy services is headed by the architect, civil e ngineers, who carry out the design. This process are planned office work into th e requirement of the client. The production of a building in a more economical, quick and orderly manner, other professional functions along side with the Arch itect for the cost implication and professional needed at the stage is the Quanti ty Surveyor. It is plant material and financial aspect in order to produce building in the quick and economical manner.

1.1 DESCRIPTION OF WORKS

The building project comprises of the construction of a proposed mediu m scale building,(A case study of a proposed hospital building for the institute of environmental studies for Kwara State Polytechnic, Ilorin.) The building has a rectangular shape with land area of about 38,000mm in length and 11,600m wi dths.

The construction is found on the plain in-situ concrete foundation with ov er site concrete floor which is of a reinforced concrete slab (150mm thick). The walls are 230mm thick hollow sand Crete block. The roofing used is long span aluminum on timber roof structure, windows are of aluminum glazed sliding by two (2) side and swing opening in the center, steel frame security metal door wi th top fixed aluminum window and hard wood frame solid oak panel door with

season wood, thick ply wood in 150mm x 150mm hard wood timber frame.

The walls are rendered and painted with emulsion internally and textured paint externally. Floor finishing is of tiles finishing on 150mm concrete floor.

Services conducted are mechanical and electrical installation as well as fi re fighting and alarm system.

1:2 AIM AND OBJECTIVES

The aim of the project is to estimate and budget for a propose medium s cale building. (A case study of a proposed hospital building for the institute of environmental studies, Kwara state polytechnic, Ilorin).

1:2:1 OBJECTIVES

1.The objective of this project or study determines the effect of site location and

Construction on estimating and budgeting of cost of building project.

2.To determine the effect of site location and construction on the cost of buil ding

Project.

3. To understand the process involved in preparation of Bills of Quantities (B OQ).

1:3 SCOPE AND LIMITATIONS

The scope of this project is to prepare a bill of quantities (BOQ) for a pro

posed hospital building for Kwara state polytechnic.

1:3:1 LIMITATION

1. Inability to conduct proper site investigation.
2. Inadequate design information.
3. Pricing (market survey) was not carried out to determine actual price of m easured items.

1.4 DEFINITION OF TERMS

PRIME COST SUM: This is an allowance within a construction contract for t he cost of specific goods or services, typically chosen by the client and supplie d by a nominated contractor or supplier. Essentially, it's a budget for items like f ixtures or fittings where the exact details and cost are not yet determined when the main contract is signed.

CONTINGENCY SUM: Is a pre-determined amount of money set aside to c over unforeseen costs or risks that may arise during the project's execution.

PROVISIONAL COST SUM: is an estimated amount of money included in a construction contract to cover work or materials that are not fully defined or de tailed when the contract is signed.

ESTIMATING: Is the process of finding an approximate value or quantity, of ten without precise measurement or calculation And Predicting cost of constru ction.

PRELIMINARIES ITEMS: Are costs and activities necessary for a project's setup and execution that are not directly tied to the finished work.

TENDER: Is a formal offer, also known as a bid, submitted by a contractor t o undertake a specific project or provide services at a predetermined price and within a set time frame.

PLANT: These are tools, machines and equipment needed for the smooth execution of project.

PROJECT: A temporary endeavor (it has a start and end date), undertaken to create a unique product, service.

CHAPTER TWO

SITE REPORT

2:0 TITLE

Estimating And Budgeting for a Proposed Medium Scale Building. (A Cas e Study Of a Proposed Hospital Building for The Institute Of Environmental Stu dies, Kwara State Polytechnic, Ilorin.)

2:1 SITE DESCRIPTION

The proposed hospital building has a total length of 36000mm and 11,600 mm in width which appear to be in a rectangular shapes.

The site is located at Kwara State Polytechnic at the Polytechnic at the scho

ol premises. It comprises of small and big trees which needs to be cleared awa y from the site.

2:2 LOCATION

The site is located within the Institute of Environmental Studies (IES) at th e permanent site of Kwara state Polytechnic.

2:2:1 ACCESSIBILITY

There are unbound roads leading to the site from the main road in the sch ool, So there is no problem for the accessibility of material to be delivered on si te and the labor to resume to work as early as possible.

2:2:2 NATURE OF THE LAND

The proposed site of the building is a virgin land. The land is human natur e and frictional with a flat surface, this will minimize the construction cost of th e foundation because of the balanced surface compare to that of the sloppy ar ea which increase the constructional cost.

2.3 AVAILABILITY AND PROXIMITY OF RESOURCES

Availability of construction resources simply means the extent of convenie nce at which the resources can be found in the market and the selling price. Whi le proximity means the closeness of the materials resources of the proposed si te, the construction resources include the following.

PLANT

All necessary plant needed for the proposed projects are readily available in Ilorin. Such plant include concrete mixer, bulldozer, electric generator,

compacting machine etc all mentioned planed can be hired in area's not far to t he site.

MATERIALS

The whole material necessary for this project all are available at Ilorin, but costly to some materials price in some area of the country.

However, all the materials needed for the smoothly execution of this prop ose project is a little but remote to the site.

LABOUR

The human effort that is necessary and needed on the proposed project, All can be found at nearly village and area's the need to be transported on a dail y basis from their homes to the site within a short distance.

2:4 TENDER OF PRELIMINARY REQUIRED

To an extent preliminaries items have a great effect on construction proje ct such preliminaries items are explained below.

SCAFFOLDING

There should be a provision for scaffolding because the project required r oofing works, there will be needed for rendering and painting at the higher level of the building.

SETTING OUT

This is the transfer of information on the building drawing to the ground w ith high degree of accuracy. In setting out site clearance is necessary by cutting down for tress and edges & topsoil excavation before making the provisions of

setting out instruments such as profile pegs, measuring tape, Builder square et c before the commencement of site operations.

TEMPORARY ROAD

This is done temporary to provide easy access to the site during work.

TEMPORARY FENCE

Temporary fence should be done to cover and protect the materials on sit e from vandalism.

FIRST AID BOX

This is very important in any construction due to some injury that may occ ur on site which might be minor or major Injuries before being taken to the hos pital.

CHAPTER THREE

PROJECT METHODOLOGY

3:0 TAKING OFF PROCESS

The order of taking-off as described [Seeley 1988] largely fellows the ord er of construction to simplify the work and to reduce the risk of items being mi

ssed, but it's not necessarily that adopted in standard method of measuremen t.

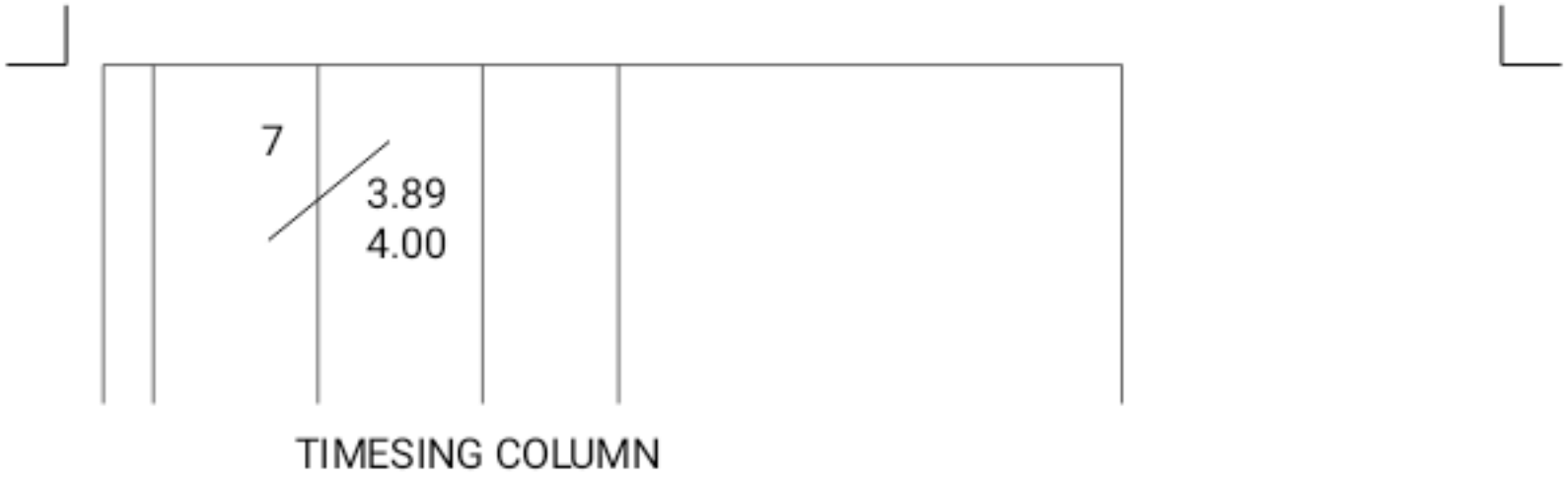
The measured items will then subsequently be solved into bill order which can embrace the work section in standard method of measurement to secure u niformity and assist with a number of skin work sections such as 1.5 (excavatin g and filling] 1.11[mixing, casting turning in situ zone), 1.14[brick and block wall ing].In a simple building the order of taking off could take from shown in the fol lowing schedule.

Although it will be appreciated that this may be varied to suit individual pre ferences and specific location.

Section of work copied from [BESMM 4 R]

	A	B	C	D	A	B	C	D

Columns A: are the time sing columns: these columns are used to enter multi pliers when there is more than of the particular items being measured.



TIMESING COLUMN

COLUMNS B ; are the dimension columns these columns are used to record the dimension in meters. Each linear dimension is underlined.

7.59	Length	LINEAR
3.45 7.59	Length Width	AREA
3.45 7.59 0.15	Length Width Height/depth	VOLUME

		2		NUMBER

NOTE: The order o

f entering dimensions is strictly

1. Length 2. Width 3. Height/Depth

		Items		Allow for bringing to sit e and removing from sit e all plant required for th is work section

COLUMN C: are the s

quaring column; the resulting areas and volumes inserted in the timesing and di

mension columns are subsequently calculated and entered into the squaring co

lumn, opposite their respective dimensions.

	4	3.45 7.59 0.15	
			1 5 . 7 1

COLUMN D: are the description column, there are many ways of inserting descri

ption on the dimension sheet but the most acceptable however, is description which commence in the same level with its first dimension. The example below shows the dimension and description should be arrange in dimension sheet.

	4	3.45 0.68 0.45	7.90	Hardcore filling to make up level under floor aver age thickness not excee ding 250mm.	**WASTE CALCULATIO**

N

This is an imaginary column occupying the right hand side of the descript ion columns in which the take-off inserts any preliminary calculation (waste) wh ich may be necessary in order to arrive at the dimensions.

All preliminary calculations must be shown in waste, they need to be set down accurately and carefully so they can be checked.

They should be written either above or below the descriptions to avoid c onfusion.

Waste calculations is necessary for each dimension except in the followi ng situation:-

A When a scaled or figured dimensions, can be transferred direct from the draw ing to the dimension column.

B. When the dimension has been deprived from a previous waste calculation

s.

C. When a dimension has been inserted from a previous dimension.

D. In all other instance the preliminary calculation, should be on waste.

Waste calculations should be done in millimeters (mm) or in three places o f decimal. Final figures are then rounded off to the nearest 10mm before being transferred to the dimension column.

3:0:1 METHOD OF TAKING-OFF

NILL: Is a method of canceling wrong during taking-off process. Nil may be don e in three (3) ways i.e. on waste calculations, on framed description and on figu red dimensions.

3.0.2 SELECTION OF TAKING-OFF

The taking off dimension is usually divided into section under the main sub divi sion of

a) Sub structure

b) Super structure

c) Finishes

d) Services

e) External work

This section found in a normal building would generally comprises the fol lowing:

a) Sub structure	1. Sub structure
b) Super structure	2. Frame

	3. upper floors
	4. Roof
	5. Stairs
	6. external walls
	7. windows and doors
	8. internal walls and partitions
	9. internal doors
c) Finishes	10. Walls finishes
	11. ceiling finishes
d) Services	12. Sanitary appliance
	13. disposal installations
	14. waste installations
	15. Heating installations
	16. Electrical installations
	17. Gas installations
	18. Lift installations
	19. Communication installations
	20. Builder's work in condition with service
e) External work	21. Site work
	22. Drainage

3.1 ABSTRACTING PROCESS

After the squaring process, the next process is abstracting. This is in a s pecially ruled sheet. The sheets are ruled with series of vertical lines that are sp aced about 250mm apart and usually on A4 in width. Each abstract sheet is he aded with the job reference, sheet number and work section and possibly the s ub-structure of the work to which the abstract dimension refer, the sheet may b e divided into work section or element.

Abstracting is process where various items are stored out into their resp ective trades as they are entered on the abstract paper.

Description are usually spaced over two columns. The dimension are entered in the left hand column while any deductions are entered on the right hand colum n.

The order of abstracting is to commence with cubic items, followed by superfic ial (square), linear and finally enumerated items. Also labour items should proce ed labour and materials, smaller items proceeding larger ones and cheaper ite ms proceeding more expensive items.

3:2 BILL OF QUANTITIES (BOQ)

A Bill of Quantities is a document used in construction projects to detail t he quantity and cost of materials, labor, and other items needed for a project, s erving as a basis for tendering and cost management.

It is a crucial document for both contractors and clients, ensuring trans parency and accuracy in the tendering and contract administration process.

BOQ itemizes all the elements of a construction project, including materia ls, labor, and equipment, with clear descriptions and quantities.

CONTENTS OF THE BILLS OF QUANTITIES (BOQ)

The principal use of the bills of quantities is to obtain competitive tenders and for this purpose BOQ should be prepared to a recognized method of meas urement to standardize the bills. Bills of quantities prepared in accordance with a standard method of measurement, fully described and accurate represent the works to be executed and this provides a uniform basis for competitive tenderi ng.

During the construction of the project, the client and the contractor se th e bill as the basis for financial management.

Bill of quantities may consist some or all of the followings:

BILL Nr.1. Preliminaries

BILL Nr.2. Preambles

BILL Nr.3. Measured works

(A) CARCASS

1) Foundations (substructure)

ii) Frame (column &beams)

iii) External & Internal walls

iv) Partitions

v) Floors

vi) Roofs

(B) FINISHING

1) External & Internal finishing (walls, floors & ceilings)

ii) Windows

iii) Doors including openings without joinery

iv) Fixtures & Sundries

v) Stairs & Lifts

vi) Plumbing & Engineering Service

(c) EXTERNAL WORKS

1) Drainage

ii) Roads, Paths, Site layout, out buildings e.t.c

(D) SPOT ITEMS- These items are alteration and repair items of a building.

BILL Nr.4. Provisional quantities

BILL Nr.5. Prime cost & Provisional Sum

BILL Nr.6. General Summary

PURPOSE OF A BILL OF QUANTITIES

a. It serves as a schedule on which all variation in the work may be value

d

b. To provide detailed list of every service to be performed.

c. To supply each contractor with information which will enable him or her to tender on the basis as his competitor.

d. To describe in addition to any description in the specification of the quan

tity of the work, and the method of carrying it out.

e. It can be used for further cost investigation and cost planning informatio n.

f. Prevent disputes as to what is and what is not include in the contract price s and the value of any work or labour which has been omitted.

PRODUCTION OF BILL OF QUANTITIES

These are several techniques of preparing bill of quantities (BOQ).

TRADITIONAL BILL METHOD: It is set down in the sequence following the outli ne of the building and engineering standard method of measurement [BESMM]. This system provides "the take off with a logical system of measurement desig ned to prevent accurate and efficient taking off. The work is measured in series of groups each representing a particular section of the building without regard t o the order in which items will finally appear in the bill. As the sequence of mea surement is not related to the order of the bill the "working up" process must in volved the preparation of an abstract to collect and arrange the items in the ord er necessary for writing the draft bill. This system is mostly used in the examin ation. It comprises of the following:

1. Taking-off usually group system

II. Working-up: squaring, abstracting, totaling, rounding-off & billing.

OPERATIONAL BILL METHOD: It is a tendering document for estimating costs prepared by architects that describes a construction project in terms of the op erations (which include labour and plant) needed to build it. This form of docu

ment contrasts with that of bills of quantities in which such tendering and esti mation is limited to the materials in the completed work Operation bills have th e advantages of enhancing communication between design and production, en abling realistic tender pricing, and making the preparation of critical-path analy sis easy for the contractor.

ACTIVITIES BILL METHOD: the activity bill was a development of operational fo rm but without the separation of labor and materials. It was sub-divided into se ction based on activities or operation derived from a network analysis. The wor k was measured in accordance with the standard method of measurement alth ough on site and offsite activities were usually separated and special equipmen t and components of and the work of nominated specialist could be grouped in spate bills (Seelay and Winfield 2005)

ELEMENT BILL METHOD: Here the work is billed in trade order not in the seque nce of the building and engineering standard method of measurement (BESM M) but under heading that from a breakdown of the building into the main elem ent of the structural wall, floor and roof. Although these provide a more useful c ontrol document during the construction operation, it makes the tendering proc edure more complicated (T.C. Onouah)

ANNOTATED BILL: it is possible for the bill of quantities to give the contract fill details of the quantities, type and quality of materials and labour and for an acc urate and complete set drawings to show him precisely where and how the wor k is to be executed. (seelay and Winfield 2005)

CUT AND SHUFFLE BILL METHOD: This is a faster method than the traditional method. The civil engineer or surveyor takes-off quantities into specially design ed sheets in duplicate where the original sheet is perforated into strips which c an be separated from the book and collected together to form group of items

DIVISION OF BILL PREPARATION

The traditional method of preparation of bill of quantities can be broken down into two main processes.

TAKING-OFF: Seeley 1988 defined "taking off" as the process in which dimensi on are scaled read from drawings and entered in a recognized form in a special ruled paper called dimension paper.

WORKING UP: This process can be divided into two stages as follow.

SQUARING: This comprises squaring the dimension and transferring the resulta nt lengths, area and volumes to the abstract.

ABSTRACTING: This squared dimension are arranged in convenient order for bi lling and reduced to the recognized units of measure.

Other processes include:

Editing: The editor must check and make adjustment in the abstract, prior to pr inting as the draft bill is written direct from the abstract.

Writing The Bill: This process involve the listing in full, the various items of wor k, Making up the complete project with the Quantities involved in a suitable ord er, under work section or elemental heading.

3:3 REQUIREMENT FOR ACCURACY

Whatever the method adopted for bill preparation, The requirement for ac curacy is the same for example

1 BESMM 4 R: - Describe "Taking off" as the process in which dimension are sc aled or raid from drawings and entered in a recognized form on a specially rule d paper called dimension paper.

2 BESMM 4 R:- Define "Tender" formal offer to construct and complete the cont ract work in accordance with the various contract documents for the tender su m.

3 BESMM 4 R:- Define "Bill of Quantities" as one that consist of a schedule of it ems of work to be carried out render the contract with quantities entered again st each item, prepared accordance with the standard method of measurement of building works.

4 BESMM 4 R:- Opened that "contract drawing depict the details and scope of t he works to be executed under the contract, they must be prepared in sufficient detail to enable the contractor to satisfactory only price the bill of quantities.

5 According to Willis's is "budgeting" is a targeted financial statement or docu ment of the cost of a proposed construction project.

CHAPTER FIVE

5.1 SUMMARY

This research was carried out to estimate and budget for a medium scal e ding for a proposed Teaching Hospital Building at Kwara State Polytechnic, er

in, Kwara State.

It is also designed to show the process of taking off, abstracting and me thod (preparing bill of quantities.

5.2 CONCLUSION

In conclusion, we observed that estimating for medium scale building project is very important.

i. It gives an itemized list of the component parts of the building with a full description and quantity of each part.

ii. It serve as a guidelines for the contractor.

iii. It provides a basis for a valuation of variable which often occur during the progress of the work.

iv. It enables all contractor tendering for a contract to price on exactly the sa me information with a minimum of effort.

5.3 RECOMMENDATIONS

From the analysis of the data in chapter four of this project, the following

recommendations was be made.

i. The Quantity Surveyor should provide an estimate during the preli minary stage of the project in order to forecast its likely cost.

ii. It is important not to under estimate and over estimate, proper est imating procedures should be used and the layout of the estimate should be clear and logical.

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