DESIGN AND CONSTRUCTION OF WOODEN FRAME WORK TWO BEDROOM FLAT AND A COMPLETE CONDUIT WIRING SYSTEM

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BAYELSA STATE POLYTECHNIS
ALEIBIRI

A PROJECT SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF THE NATIONAL DIPLOMA (ND)

FEBRUARY, 2023

DECLARATION

We **(1) LUCKY IMBOKO BEREPUGI ALFRED** with the Matriculation Number **ND/ELECT/20/037 (2) PROGRESS ANDERSON FRANK** with the Matriculation Number **ND/ELECT/20/049 (3) EMOMOEME ENDONI** with the Matriculation Number **ND/ELECT/20/032 (4) PETER E. KALABUMOR** with the Matriculation Number **ND/ELECT/20/036 (5) JAMES OBI** with the Matriculation Number **ND/ELECT/20/040 (6) ZEKIEL SILAS ETONZOR** with the Matriculation Number **ND/ELECT/20/046,** declare that this project on the **DESIGN AND CONSTRUCTION OF WOODEN FRAME WORK TWO BEDROOM FLAT AND A COMPLETE CONDUIT WIRING SYSTEM** was carried out by us, that it is our original work and it that has not been submitted wholly in part for the award of any certificate or degree in any institution.

LUCKY IMBOKO BEREPUGI ALFRED Signature date…...…….

PROGRESS ANDERSON FRANK Signature date…...…….

EMOMOEME ENDONI Signature date…...…….

PETER E. KALABUMOR Signature date…...…….

JAMES OBI Signature date…...…….

EZEKIEL SILAS ETONZOR Signature date…...……

Confirmation by Supervisor
Name of supervisor: Egnr. E. A. Yabefa

DEDICATION

We dedicate this work to Almighty God for strength and life given to us throughout the period of this work and in all our studies in the Bayelsa State Polytechnic Aleibiri Bayelsa State, Nigeria.

CERTIFICATION

This is to certify that the project **titled "Design and construction of wooden frame work Two bed room flat and completed electrical conduit wiring system"** carried out by LUCKY IMBOKO BEREPUGI ALFRED, PROGRESS ANDERSON FRANK, EMOMOEME ENDONI, PETER KALABUMOR, JAMES OBI AND EZEKIEL SILAS ETONZOR, has been read and approved for the Award of National Diploma In Electrical/Electronics Engineering Technology of Bayelsa State Polytechnic, Aleibiri, Bayelsa State, Nigeria.

Supervisor: Engr. E. T. Yabefa

Signature and Date……..

Head of Department: Engr. Okosi Festus

Signature and Date……

Dean. School of Engineering: Engr. E. T. Yabefa

External examiner…….

Signature and Date……

ACKNOWLEDGEMENT

We wish to use this medium to first and foremost express our profound gratitude to our Heavenly Father who has been our strength and inspiration in life and in this academic endeavor.

We also thank and appreciate our Project Supervisor Engr. E. T. Yabefa, who double as the Dean of faculty of school of ENGINEERING. Whose assistance and thorough supervision made this work a reality. We also want to appreciate all the lecturers in the school of Engineering, who had in one way or the other contributed to our progress.

We own our loving wives, children, parents, relatives, friends and colleagues our profound gratitude for always being there for encouraging us and financial assistance during the curse of running this program.

We want to thank our HOD, Engr. Okosi Festus who stood by us.

ABSTRACT

This project is titled the design and construction of a wooden frame work Two bedroom flat and complete conduit electrical wiring system installation to serve its purpose. It explain basic feared of electrical domestic installation and protection. The **INSTITUTE OF ELECTRICAL ENGINEERING (IEE**) regulator standard was followed in mounting all the electrical equipment and fittings that was installed The conduit wiring system is safe, easy to maintain and lest longer.

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF THE PROJECT

A conduit electrical wiring is an electrical installation of cabling and associated devices such as switches, distribution boards, sockets, lampholders and light fittings. But most importantly, the above subjects materials should be original. This will the fear of electrical fire which may occur as a result of using sub-standard electrical materials.

Also, use of original material help the said job to stay for a longer time. This help the owner for the job for unnecessary repair.

Conduit wiring is very importance base on the fact that its avoid or prevent electric shock because no wire is on the surface.

Though conduit wiring consume or involve more money than surface wiring but, durability is very high and neatness. `

Please note that electrical installation in every home and office helps in so many ways such as, cooking, ironing, cooling system, reading at night, security in the environment, preservation of foods items, drier etc. Especially international communities has constant light, it makes things easy for them, reason been that they made use of it in almost every house. Also, electrical installation at home is very important.

1.2 PROBLEM STATEMENT

This particular installation can only be powered with and can comfortably be use for light appliance not for appliances with heating element such as electric iron or electric water.

1.3 AIM OF THE PROJECT1

The aim of this project is to design and construct Two bedroom flat and how to show

complete electrical conduit wiring or electrical installation will look like.

1.4 OBJECTIVE OF THE PROJECT

The objective of the project is to design and construct Two bedroom flat and how to show complete electrical conduit wiring or electrical installation.

1.5 SIGNIFICANCE OF THE PROJECT

The main purpose of an electrical wiring system is to satisfy the user need and requirements, while coordinating the various fittings, such as the lighting, heater, and other systems.

1.6 SCOPE OF THE PROJECT

Wooden Two bedroom flat electrical installation or electrical conduit wiring give all-round power supply to the house.

CHAPTER 2

LITERATURE REVIEW

2.1 HISTORICAL BACKGROUND OF WORK

Electrical installation to American homes began in the late 1890s and blossomed from 1920 to 1935, by which time 70 percent of American homes were connected to the electrical utility grid. In the following 100-some years, the methods for installing wiring in those homes have been several important innovations aimed at improving the safety of electrical systems.

Between 1890 and 1910, a wiring system known as knob-and-tube was the principal system of installation. It was quite a dependable system for the time, and a surprising number of American homes still have knob-and-tube wiring functioning, where it is often found alongside more modern updates. In knob-and-tube wiring, individually conducting wires protected by rubberized cloth fabric are installed in stud and joist cavities, held in place by porcelain knob insulators attached to the sides of framing members, and protected by porcelain tube insulators where the wires run through framing members.

1st of October 2022, That development is rooted in a combustion breakthrough in the 1990s that enabled a lean premixed combustion process compared to the earliest.

15th of January 2000, Electrician were hired to build and operate these installations. The first successful use of electricity at one of these events occurred at the 1820, in arguable pivotal contribution to modern power systems,

Electrical generation started in Nigeria in 1896 but the first electric utility company, known as the Nigerian Electricity Supply Company was established in 1950 and assumed responsibility for electricity generation and distribution for the country 1951. And now, the electricity reform Act of 2005, unbundled PHCN into 11 Distribution companies.

2.2 REVIEW OF DIFFERENT TYPES OF ELECTRICAL CONDUIT WIRING

2.2.1 ELECTRICAL METAL TUBING (EMT): is one common example of unbending conduit. It is generally made of qalvanized steel but can be aluminum as well. EMT is typically described as the “thin wall’’ conduit because it is thinner and lightweight compared to RMC.

2.2.2 INTERMEDIATE METAL CONDUIT (IMC) this conduit is more likely a lighter-weight and thinner version of RMC. However it is equally approved to be utilized for all similar applications, just like RMC.

2.2.3 RIGID METAL CONDUIT (RMC) it’s stand for rigid metal conduit is heavyweight galvanized steel that is installed using threaded fittings. It has been used commonly outdoor to provide further protection from damage.

2.2.4 FLEXIBLE METAL CONDUIT (FMC) FMC is derived from the name of the inventor. It has a spiral construction that has made it extremely flexible. The flexibility of FMC makes it adaptable through walls and even others structures standard.

CHAPTER 3

3. MATERIALS AND METHODS

3.1.1 Two (2) inches, Three (3) inches wood: These woods were used for the construction of the "wooden structure" to show how block building looks like. Woods were the representative of the walls. They brought out the shape of the structure for viewers.

"wooden structure" to show how block building will looks like. Woods were the representative of the walls. They brought out the shape of the structure for viewers.

3.1.2 PLYWOOD: The work of plywood is to support the woods to create out the rooms for the structure that will help the viewers to know the said house rooms. Also, it gives beauty to the wood work.

3.1.3 NAILS: The use of various sizes of nails is to nailed the linked areas or enter connected areas for the wood work.

3.1.4 Wires/Cables: A wire is a long thin piece of metal that is used to fasten things or to carry electric current. If you wire something such as a building or piece of equipment, you put wires inside it so that electricity or signals can pass through it.

For example:

a.) 1.5mm wire/cable: This wire/cable is connected to carry current through all lighting points.

b.) 2.5mm wire/cable: This wire/cable is connected to carry current through all 13amp wall sockets used for television/radio, iron, freeze.

c.) 4mm wire/cable: This wire/cable is connected to carry current through all 15amp sockets used for air-condition, water heater.

3.1.5 Switch: In electrical engineering, a switch is an electrical component that can break or connect the conducting path in an electrical circuit, interrupting the electric current or diverting it from one conductor to another.

3.1.6 Socket: Electrical sockets or outlets allow us to plug in appliances to attach them to the electrical grid and provide power for them to run. There are socket testers you can buy to make sure the polarity and power to a socket is what it should be.

3.1.7 Lampholder: Electrical lampholders used for hanging and allow the free flow of current to electrical bulb for lighting.

3.1.8 Bulb: Electrical bulbs, were fixed into lampholders to receive electrical current.

3.1.9 PVC PIPE: PVC pipe usually fit into the ceiling, wall and ground to allow wire/cable to pass through it.

3.1.10 COUPLER: Electrical couplers are used in coupling any possible pipe joints for easy running of wire/cables.

3.1.11 MALE BUSH: Electrical male bush works as an imitator between the socket and pipe where you fix in the pipe before running the wire/cable.

3.1.12 CLIP: Electrical clips use for firming the pipes especially wooden and iron houses or buildings.

3.1.3 DISTRIBUTION BOARD: Electrical distribution board does heavy work by controlling the whole building. The primary function of it all is not only transferring electrical power to the various parts of the building but, it helps to put off by itself whenever excess current comes. Because, the circuit breakers inside of it does that work.

3.14. KNOCKOUT PATTRESS BOX: Electrical knockout box used in fitting into the wall for the purpose that the pipe will be terminated to it, whereby, the socket screw on it.

3.1.15 TEE, U, CROSS: This electrical and other related fittings use for the pipe linkage to allow the movement of pipes to it locations. It also enables the electrician to

pass fishing tape through them.

3.1.16 STOPPING END: Is usually fitted at the end of each conduit pipe to enable lampholders, fan regulators to be fitted.

3.2 ELECTRICAL DRAWING

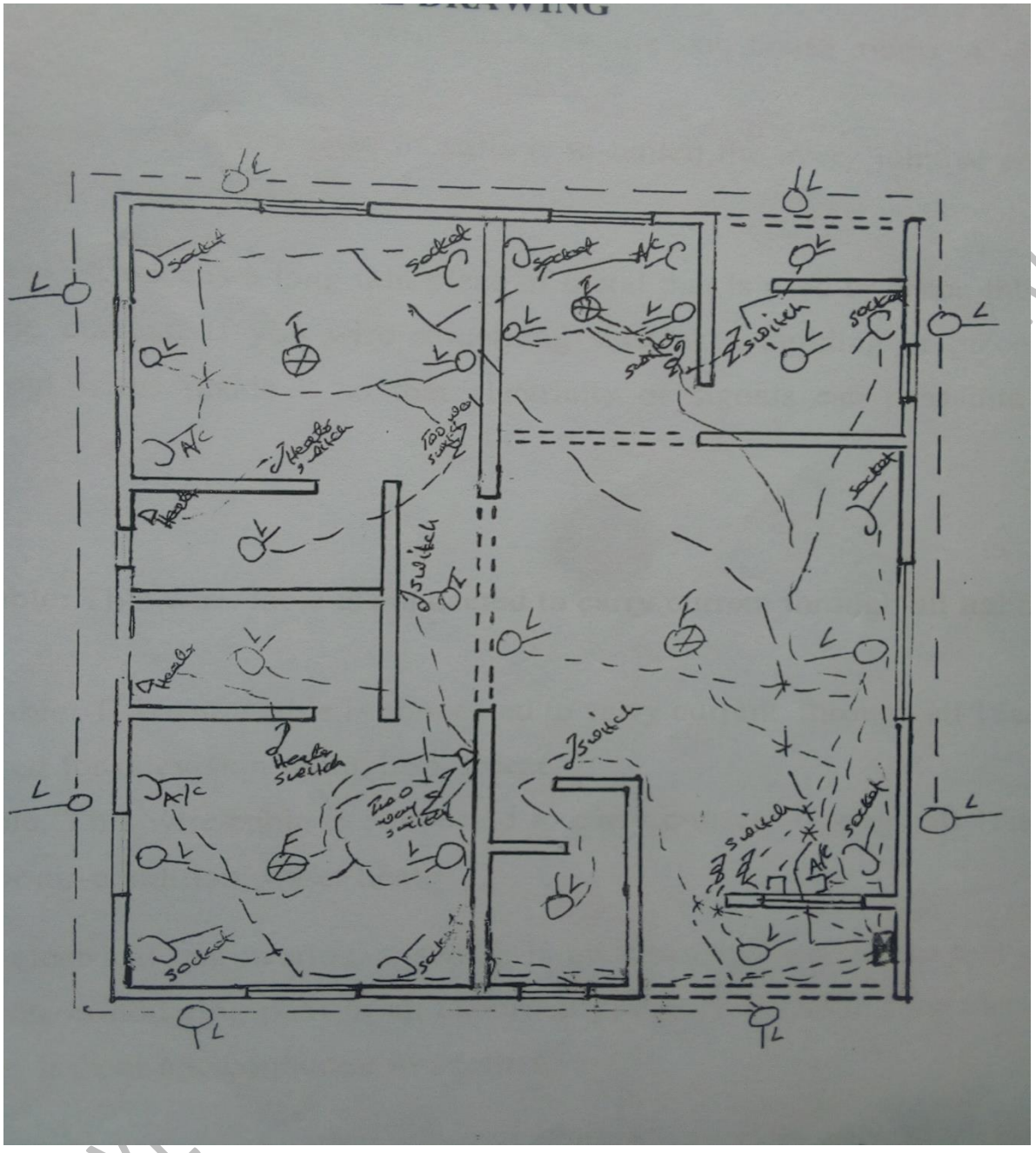

Fig 1

3.3 DESIGN/CONSTRUCTION/CONDUIT WIRING SYSTEM

Construction of “wooden structure” though shouldn’t have been part of this electrical project but, for the fact that without it, the aim and objective of our project wouldn’t have been achieved. The construction of the “wooden structure” is very important to this project because, it helps us to have our electrical connection to show how Two Bedroom electrical installation will be. Though it wasn’t easy to prepare it because, is purely for civil engineering work. Electrical wiring or installation of the Two bedroom flat can be of a help to the user for use of so many devices. Light brings illumination and direction, and is very important to any man in the society especially when there is light in your area of building. As such, the need to electrify your building is needed.

Most importantly, the accessories one may use for the connection matters a lot.

For example in this project, we used 4mm cable for air-conditioner. The primary reason for this is that air-conditioner carries high voltage, whereby you can’t make use of leaser wire/cable that carries low voltage.

Also, we consider 2.5mm wire/cable for ordinary socket points to serve some voltage carry devices such as iron, radio/television, charging points, freeze/freezers.

The 1.5mm also important for lighting points. Though one will check the numbers of the lighting points as to divide them among the capacity of wire/cable into a particular switching point.

3.4 PRINCIPAL OPERATION OF ELECTRICAL INSTALLATION:

Electrical installation operation is based on public or private power supply. That can only give voltage to the distribution board and distribute current to the various points. It is the same way the various switches will receive the voltage whereby, the switch control the lighting points as to off and on.

CHAPTER 4

BILL OF QUANTITY AND PROTOTYPING

4.1 SYSTEM DESIGN PARAMETERS

This chapter expatiate on each stage of the constructed work seen in chapter (3) which deals with gathering of various materials for each stage.

The material was assembled with the aid of electrical installation. The case of the house is built with wood and plywood while electrical installation was done with conduit electrical materials.

Since the project work deals with the construction of wooden house and electrical fittings, the various steps/procedures on how this was achieved would be discussed under this chapter which includes;

1. Dimensioning
2. Construction wooden house
3. Pipe, tee, U, cross, boxes.
4. Connection wires/cables
5. Accessories fittings

4.2 DIMENSIONING: is the process of measuring either the area or the volume that a material occupies. It can be seen as the method of calculating the length of wood and pipe will occupied for a space for the handling, transporting and invoicing of goods. In this project plywood, ceiling board, electrical materials were transported. Equally, the above named materials safety was considered during dimensioning. The purpose of dimensioning is to provide a clear and complete set of dimensions that will permit only one interpretation needed to construct the path ways that will follow guidelines during dimensioning such as:

(a) Accuracy (b) neatness

4.3 CREATION OF HOLES: holes were created on the ceiling in order to fit in the PVC pipes. This is done to maintain stability and neatness.

4.4 SPECIFICATIONS

*Plywood = 1.8cm thickness

*Wood = 50cm thickness

*Wood = 50cmx750cm thickness

*PVC ceiling board = 1.8cm thickness

*3 Inches nail

*Copper

*Batten 1.8cm thickness

*Male bush 0.654 thickness

*T-box

*U-box

*Cross box

*Stop end

*Coupler

*Distribution board (D4)

*20mm PVC pipe

*Lampholder

*1.5mm wire/cable

*2.5mm wire/cable

*4mm wire/cable

*Screw nail

*Tape

*3x3 box

*3x6 box

*Bulb

*13amp single socket

*13amp single double

*15amp socket

*Double switch

*Single switch

Table 4 bill of engineering measurement and evaluation (BEME) 20/01/2023

S/NO	DESCRIPTION	QTY	RATE	AMOUNT N : K
1	2 by 2 by 12	25	400	6,000.00
2	2 by 3 by 12	5	450	10,000.00
3	3 Inches nail (LB)	4	500	2,250.00
4	Copper nail	2	600	6,000.00
5	Plywood	1	6000	2,000.00
6	PVC ceiling board	2	3000	1,200.00
7	Batten	2	1500	3,000.00
	WOODEN SUB. TOTAL 30,450.00			
1	Male bush	30	30	900.00
2	T-box	15	200	3,000.00
3	U-box	15	200	3,000.00
4	Stop end	20	200	4,000.00
5	Cross box	25	250	6,250.00
6	Coupler	30	30	900.00
7	Distribution board (D4)	1	10000	10,000.00
8	20mm PVC pipe	20	480	9,600.00
9	Lampholder	20	400	8,000.00
10	1.5mm wire/cable	3	4000	12,000.00
11	2.5mm wire/cable	3	5000	15,000.00
12	4mm wire/cable	1	9000	9,000.00
13	Screw nail			1,500.00
14	Tape	2	200	400.00
15	3x3 box	30	200	6,000.00
16	3x6 box	3	250	750,00

17	Bulb	25	250	6,250.00
18	13amp single socket	5	500	2,500.00
19	13amp double socket	3	800	2,400.00
20	15amp socket	4	600	2,400.00
21	Single switch	3	400	1,200.00
22	Double switch	5	500	2,500.00
23	Photo attachment work		5000	5,000.00
24	Sublimation plate	1	10000	10,000.00
25	Project report writing		35000	35,000.00
26	CD production	1	400	400.00
27	Report hard cover production	4	10000	10,000.00
28	Report production binding copies	10		14,040.00
29				**ELECTRICAL SUB. TOTAL 181,990.00**
30	**TRANSPORTATION 16,000.00**			
31	**GRAND TOTAL N228,440.00**			

4.5 **PROTOTYPY**

***FRONT VIEW**

This is where the veranda is located in the building. Also, is where the distribution board is mounted. Distribution board does the highest work in the electrical system where it is used to distribute energy to every part of the house.

***SIDES VIEW**

Is where all the security lighting points are been fixed, due to their importance Attached for the sake of security.

*INNER VIEW

The inner view comprises of lighting points where it brings brightness. It also have sockets, water heaters, switches and fans provision fixed.

***TOP VIEW**

This is where electrical pipes are fixed to various points. Pipes are important because they prevent electrical shock, also helps the smooth running of the cables to terminate at their various points.

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 CONCLUSION

This section of the project report forms the concluding part of the project report and takes a look at some problems entertained during the progressive electrical installation system. The basic objective of this project were realized, The objective of the project is to design and construct wooden Two bedroom flat and how to show complete electrical conduit wiring or electrical installation.

Though this project is efficient and reliable.

5.2 RECOMMENDATION

After the completion of this project work, the following recommendations are necessary.

1. Do not use voltage line made for light for air-condition

2. Do not use 2.5mm line voltage for air-condition
3. Do not keep your sockets on while away.
4. Do not keep your distribution board on while absent in Town.
5. Apply only AC source to power the house (Devices)

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