TECHNICAL REPORT ON STUDENT INDUSTRIAL WORK EXPERIENCE SCHEME (SIWES)

HELD AT

UNIVERSITY OF ILORIN HOSPITAL

OLD JEBBA ROAD, OKE-OSE, ILORIN KWARA STATE NIG.

BY

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ACKNOWLEDGMENT

What I am now is by the grace of the Almighty God who is able to do all things and make me to excel abundantly above in all I ask and think, according to the power that works in me unto him the glory and domination.

The success of this report however would not have been possible without the invaluable support, assistance and encouragement of a large number of people who are too numerous to mention.

My thanks goes to my lovely parents Mr. Akinade for their words of encouragement and to my brothers and sisters. And to those whose names did not appear who at one point or the other contributed to the success of this write-up.

I say thank you all.

PREFACE

Student industrial work experience scheme is geared towards educating and giving the participant i.e. the student to the practical aspect of the academic discipline and course he or she is pursuing.

This technical report is based on all the training acquired by me during the course of my industrial attachment the attachment lasted for four months (August – December 2023)

ABSTRACT

This report cover the systems of electrical installation the types of electrical installation system, such as surface wiring system and conduit wiring system, the tools and instruments used and their uses, various types of materials used in electrical installation including the cable to be use and various things to consider before the electrical installation of a building.

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CHAPTER ONE

1.0 INTRODUCTION

Student industrial work experience scheme (SIWES) programmed, it was establish in year 2000 it is compose of the highly technical and electrical works. The major reason behind the establishment of SIWES programmed and the importance of the student to display their talents and also learn the practical aspects of their fields of study. After their graduation, they will have something valuable to contribute to the society. They will also be able to face future challenges in their respective field of study.

1.1 SPECIFIC AIMS OF SIWES.

a) To introduce trainee to the industrial atmosphere and discipline.

b) To provide opportunity for the trainee student to apply knowledge obtained in form of lecture and practical to industrial reality.

c) To provide an opportunity for the trainee student to assess their own suitability for carriers.

d) It enable the industrial to be able to recruit graduates to the post appropriate to their background, training and the orientation during the change over from student to work status.

e) To be introduced to as wide a range of industrial skills as much as possible.

f) To enable trainee student become familiar with the organization and control of the industries similar to where they are likely to work after graduation.

1.2 OBJECTIVES

Specifically, the objectives of the students industrial Work Experience Scheme are to provide an avenue for students in Nigeria Tertiary Institutions to acquire industrial skills and experience in their course of study.

CHAPTER TWO

2.0 BRIEF HISTORY OF THE ORGANIZATION

The University of Ilorin Teaching Hospital belongs to the second (2nd) generation of Teaching Hospitals in the country. The Hospital came into existence on 2nd of May 1980 along with five other hospitals located in Jos, Calabar, Sokoto, Maiduguri and Port Harcourt.

Temporary Site and Lease Agreement The University of Ilorin Teaching Hospital took off in July 1980 and started its operations using as its temporary site, the Ilorin General and Maternity hospitals, which were owned by the Kwara State Government. The formal release of the two hospitals to the Management Board of this Teaching Hospital was done on 1st September 1981 when a lease agreement was signed between the Federal Ministry of Health and the Kwara State Government. The University of Ilorin Teaching Hospital remained in these two old sites (General Wing was built in 1955 and Maternity Hospital Wing was built in 1937) till early 2009 when gradual relocation to the Permanent Site commenced. Full movement to the Permanent site from the General Hospital Wing was completed in mid 2010. However the training Schools of the Hospital are presently occupying the Maternity wing.

Vision

To transform University of llorin Teaching Hospital to be the hub of quality and standard healthcare service delivery in Africa by the year 2019, a player in the delivery of quality healthcarc service globally and expand the frontiers of the hospital in healthcare delivery by the year 2021.

Mission

This is to be attained through provision of quality and standard healthcare delivery that is second to none in Africa by the year 2019, and one of the global healthcare service institutions by the year 2021 regardless of clients statuses or creeds through quality researches, training (capacity building, manpower development and staff motivation) and services.

CHAPTER THREE

3.0 ACTUAL WORK-DONE

- I was thought on how to replace burnt socket, switches and bulbs in the building.
- I leant how to fix a Ceilling fan
- I was also thought how to install distribution Board

ELECTRICAL TOOLS AND INSTRUMENTS

Electrical Engineering makes use of different instrument in performing different operations.

Some of the instruments used are listed below:

- Screw driver
- Bending spring
- Gloves
- Pliers
- Hammer
- Neo Tester
- Fixing tape
- Hack saw
- Centre punch
- Raw plug drill
- Cutting pliers
- Multi meter

3.1 USES OF THE ABOVE TOOLS AND INTRUMENTS

i. **Screw Driver -** it is used for loosing and tightening screw.

ii. **Bending Spring** – it is made up of spring, it is used in bending PVC pipe when working on conduit wiring system.

iii. **Gloves** –it is used to guide against electrical and mechanical damages to the hands.

iv. **Pliers** – it is used for cutting, disconnecting or removing installation material like rubber from a conductor. It is also used to hold material firmly in order to couple the material.

v. **Hammer** – it is used for clipping cable to a surface.

vi. **Tester** – it is used to check whether a conductor is live. It is also used to detect the flow of current in a conductor.

vii. **Fixing Tape** – it is used in passing wire into PVC pipe when working on conduit system wiring.

viii. **Hacksaw** – it is used for cutting metal and PVC pipe when working on conduit wiring system.

ix. **Center Punch** – it is used for making point in metal or concrete blocks before drilling.

x. **Cutting Pliers** – for cutting conductors

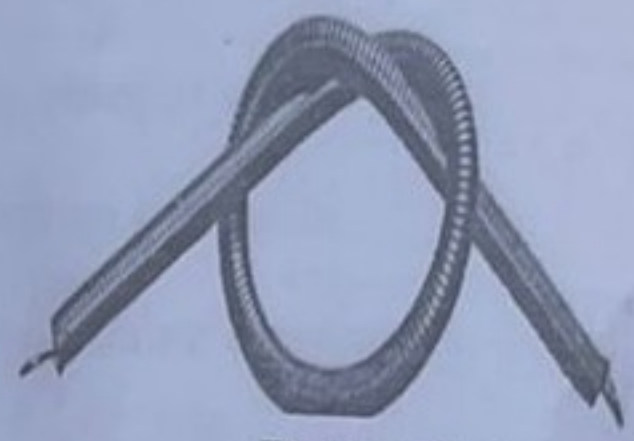
xi. **Raw plug Drill** – for forming holes inside the block or concrete.

xii. **Multi Meter** – is an instrument designed to measure electric current, voltage and usually resistance, typically over several ranges of value.

DIAGRAMS ARE SHOWN BELOW

Multi Meter

Neo Tester

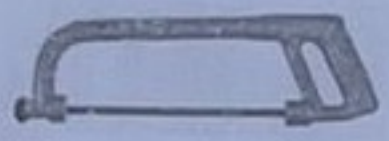


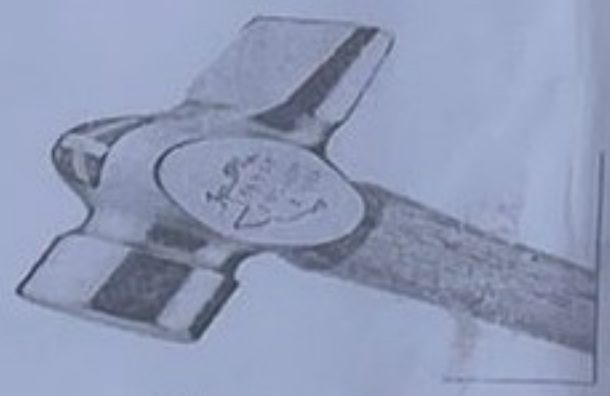
Bending Spring

Nose plier

Cutting Plier

Combination Plier





- Hack Saw

Clipping Hammer

3.2 MAINTENANCE OF THE TOOLS.

The maintenance are listed below.

- Keep the tools in cool and dry place.
- It should be check regularly.

- It should be kept away from rain.
- It should be taking away from in sting.

3.3 SOME SAFETY PRECAUTION IN ELECTRICAL INSTALATION.

- Always put on your overall when in workshop or any place of work.
- Always remove the fuse when carrying out installation on live cable.
- Test the conductor polarity by means of tester not by touching it ordinarily.
- It is dangerous to operate electrical machine you are not familiars with.
- Spark from switch cause serious burns.
- Always use correct tools for all jobs. Since incorrect tools used can result in accident.
- When using ladder, ensured that it is placed properly to avoid it from falling down.
- When working on concrete pole with ladder, ensure safety belt is used to hold the body when working.

3.4 WIRING SYSTEM.

When choosing a system of wiring from a building, the following point must be put into consideration:

- **Neatness of the finished jobs:-** To see if a particular wiring system if choosing a for a building will not be eyes sure.

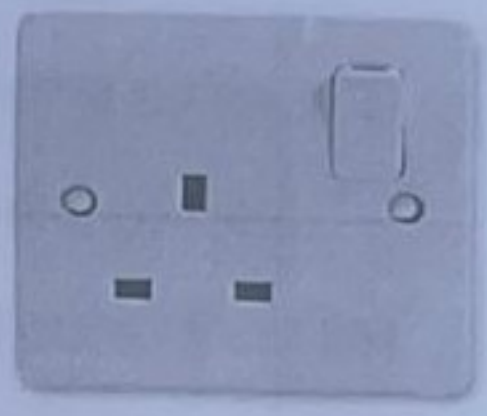
- **Time required to complete the wiring:-** That is, if therefore length of time that is allocated for the completion will not fail, particularly urgent jobs being allocated by government .
- **The durability of the installation:-** If a particular wiring chosen withstanding the hazard condition of usage or will last long as expected of the installation. For Example, a surface PVC. Sheathed wiring will prove hazardous to a metal workshop.
- **Future Extension and Alteration:-** One must ensure that a system of wiring will give room for future addition. For Example, a concealed conduct wiring will not be suitable for factory installation which is often subjected to extension.
- **Drainage to the fabric of the building by cut away:-** For Example, it will be better to wire a completed multi-storey building in surface wiring than concealed conduct which may weaken the wall and pillars when chiseled to form channel.
- **Special consideration like dampness:-** Flammable in a situation which is either permanently damp or intentionally damb, damp proof fitting and wiring materials must be used to prevent ingress of moisture to the wiring and if flammable situation all accessories and apparatus to be used must be of flame proof type.
- **Cost of installation:-** Cost is one of the important aspect to be considered when deciding on a system of because a client may want to wire his or her building in fill conduit, because of the neat appearance but by the time he or she sees the estimated cost of the wiring he or she may not be able to afford the cost.

3.5 MATERIAL NEEDED IN ELECTRICAL INSTALLATION

- **Cable:-** A Length of insulated single conductor (Solid or stranded), or of two or more such conductor, each provided with its own insulation, which are laid up together.
- **PVC Sheathed Cable:-** A Cable of which the conductor insulation and mechanical protection is of polyving-chloride.
- **Cable Trunking:-** A cast for cables, constructed of metal sheet, wood or insulating materials and may be of rectangular or square cross section of which one side is removable or binged for the whole of its length for the purpose of laying cable therein.
- **Circuit Breakers:-** A mechanical device for making and breaking a circuit both under normal and abnormal condition, such as those of a short circuit being broken automatically.
- **Consumers Control Unit:-** It is a distribution board incorporation a main switch or main circuit breaker within its unit.
- **Distribution Board:-** This is an assemblage of parts including one or more fuses or miniature circuit breaker, arrange for the purpose of distribution of Electrical energy to final sub-circuit and to other distribution boards.
- **Fuse:-** It is a device for opening a circuit by means of a conductor designed to melt when an excessive current flows. Its consists of two parts, the base and the bridge.

MATERIALS USED IN ELECTRICAL INSTALLATION

Lamp holder



13A Flush Socket

13A Double socket

Conductor Cable

Lamp holder and Bulb

3-way flush switch

2-way flush switch

1-way flush switch

ELCB

Cables and Socket

3.6 TYPES OF WIRING SYSTEM

1. Surface wiring system
2. Trunking wiring system
3. Conduit wiring system

3.7 SURFACE WIRING SYSTEM

This is the system of wiring by which is called PVC sheathed wiring on surface, this involve the use of PVC insulated laid up in flat formation with a close covering of thought PVC as mechanical protection since there is no metal sheat. A bare conductor as in twin and earth cable will be enclosed in PVC sheat to serve as the earth continuity conductor.

SOME OF THE MATERIALS USED FOR SURFACE WIRING SYSTEM

- plastic box (3x3, 3x6)
- Joint box
- Lamp holder
- Cable
- Clips and nails

3.8 CONDUIT WIRING SYSTEM

It is laying of PVC pipe inside the blocks for passing cables for conduit wiring.

SOME OF THE MATERIALS USED FOR CONDUIT WIRING SYSTEM

- Iron box (3x3, 3x6)
- Pipe (20mm, 25mm)
- Wall bracket box("U" way, "end" way, and "four" way)

3.9 TYPES OF CONDUIT WIRING SYSTEM.

- Half conduit system wiring.
- Full conduit system wiring.

3.9.1 HALF CONDUIT SYSTEM WIRING

This system of wiring it require laying for PVC pipe inside the block and on the ground, it require less cost and less materials.

3.9.2 FULL CONDUIT SYSTEM WIRING.

This is the system of wiring by which it require laying of PVC pipe inside concrete blocks, on the ground and including the inside of the ceiling such as that there won't be a space for cable to be showing or to be seen outside. It require more cost than the half conduit system of wiring, it is require more materials than the half conduit, its more well presentable for the well wise customers.

3.10 LAYING OF CONDUIT PIPE

Good conduit work can only be achieved when there is good PVC pipe laying. The following points will assist Electricians in this field.

- **PLANING THE LAYOUT:-**The following point should be considered before starting the actual layout.

  i. The Building should be studied property (e.g if it is bungalow).Draw your layout.

  ii. Make sure the consumer has a requirement clearly before started in the architects drawing.

- **MARKING OUT:-**During the marking out, the following procedure should be taking.

  i. Position of the boxes for Switches, Sockets, Cooker, etc. should be clearly marked.

  ii. Position of the Distribution Board.

The laying cannot be done by using chalk to make marks and lines as following.

- **Channeling and cutting bricks or concrete:** After the marking out of the building, the next thing is to use chisel or hammer to cut or channel the bricks in order to put conduit pipes inside the bricks.
- **Preparing the conduit:-** Conduit comes in length, length should be cut to size with hacksaw having a fine tooth blade. It should be cut in a pipe vice. Preparing the conduit will also involve bending of the conduit depending on the type of conduit being installed which may heavy or light gauge conduit, full or half pvc pipe laying system.

Size and Cable Used in an Electrical Installation:

S/N	SIZE OF CABLE	USES
i.	1.5mm	For lighting
ii.	2.5mm	For Socket of 13Amps and 15A
iii.	4mm	For AC and Cooker Control unit
iv.	6mm	For Cooker Unit
v.	10mm	For meter and distribution board
vi.	16mm	For Servicing Building

TYPE OF SWITCH THAT WE HAVE:-

We have different type of switch as follow:

i. We have One Gang Switch.

ii. We have Two Gang Switch.

iii. We have Three Gang Switch.

iv. And we also have Four Gang Switch.

TYPES OF SOCKET THAT WE HAVE:

i. 13A (3X3 for one way, 3x6 for two way socket)

ii. 15A (3X3 for one way, 3x6 for two way socket)

CHAPTER FOUR

4.0 RELEVANCE OF THE EXPERIENCE GAINED AT STUDENTS FIELD OF STUDY

In summary, this program has exposed me to some practical aspect in relation to my course of study (Electrical engineering) and I benefitted greatly from the grogram. What I learnt at various site involves the following

- Wiring installation system.
- Type of wire suitable for installation
- Types of wiring system
- Tools suitable for electrical installation

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATION

5.1 CONCLUSION

The SIWES programmed has contributed positively to my exposure and training in the field of electrical and electronics engineering. It has also helped me to put into practice the knowledge gained in classroom with the actual industrial experience. Also to develop a critical and realistic approach to problems with their solution in the electrical field.

5.2 RECOMMENDATION

The polytechnics should make it compulsory for all students, since the programmed goes way in improving student's practical and theoretical experience.

SIWES programmed is such a program that exposes student to the practical aspects of what he/she has been taught theoretically in the school.