A TECHNICAL REPORT
ON
STUDENT INDUSTRIAL WORK EXPERIENCE SCHEME (SIWES)

HELD AT
MEMMAR ENGINEERING COMPANY LTD
BEHIND BOLADE GAS STATION, EGBEJILA ROAD, OFF ASA-DAM, ILORIN, KWARA STATE

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SUBMITTED TO
DEPARTMENT OF ELECTRICAL/ELECTRONICS ENGINEERING, INSTITUTE OF TECHNOLOGY (IOT), KWARA STATE POLYTECHNIC, P.M.B. 1375, ILORIN

IN PARTIAL FULFILLMENT FOR THE REQUIREMENTS FOR THE AWARD OF NATIONAL DIPLOMA (ND) IN ELECTRICAL/ELECTRONICS ENGINEERING

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Preface

SIWES is a program designed by the Industrial Training Fund (I.T.F.) to allow student acquire experience, knowledge and skill by applying the learnt in classroom into practical in their respective field of study.

Dedication

This report is dedicated to Almighty God, who strengthen me and spear my life to complete my SIWES program in Memmar Engineering Company Limited.

Acknowledgement

Firstly, I am indebted to my able director of Memmar Engineering Company Limited, Department of Electrical for helpful and constructive citoles he gave me during my period in the organization.

My gratitude goes to my parents for their financial support throughout my academy career in life, I pray that what is making you to laugh, rejoice over your children, the devil will not turn it to weeping for you in Jesus name (Amen).

Finally, I acknowledge the efforts of the lecturer in the department of Electrical and Electronics Engineering.

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CHAPTER ONE

1.0 Introduction

The practical background of the engineering student industrial work is purposely set up in partial fulfillment of the requirement for the award of National Diploma (N.D) in Electrical/Electronics Engineering. I fulfilled my compulsory four months Industrial training at University of Ilorin Teaching Hospital Electrical Department.

The report comprises of my experience, knowledge and my involvement in the job description during the course of my SIWES.

1.1 Definition of SIWES

SIWES means Student Industrial Work Experience Scheme. It is a course by which students are exposed to practical training in their respective field of study. SIWES is the acceptable skill training programme set up as the requirement for the award of National Diploma (ND) certificate for student studying engineering and applied science. Its effort is to bridge the gap existing between theory and practical aspect of engineering and some applied science.

1.2 Goals and Objectives of SIWES

1. To enable students to be practically oriented
2. To enable students to handle equipment and machine in their field of study.
3. To expose students to challenges to be face in their course of study and their fields after graduation.

CHAPTER TWO

2.0 Brief History of the Company

The company took it mandates since 2017 in Ilorin, behind Bolade Gas Station, Egbejila Road, Off Asa-Dam, Ilorin, Kwara State.

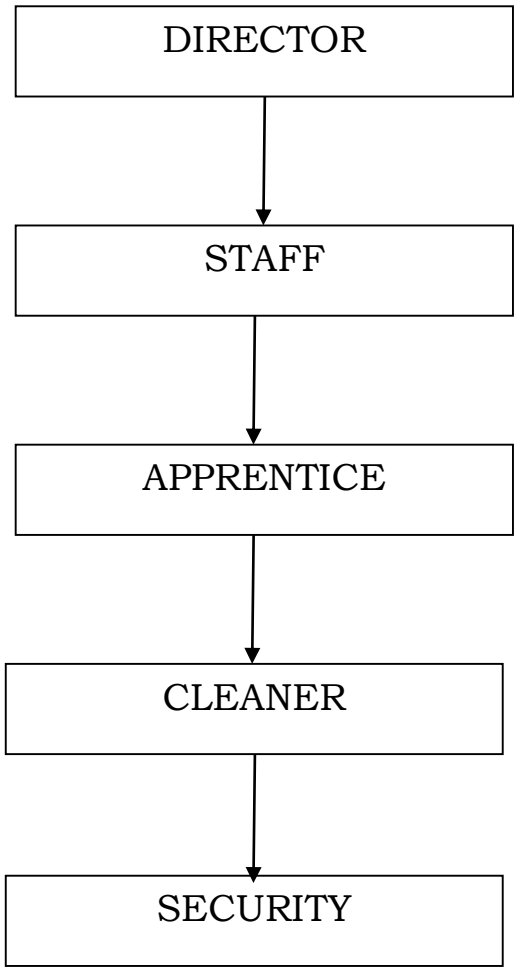
2.1 Vision

The vision of the company is to provide the immediate community with optimum service in electrical works.

2.2 Mission Statement

To provide custom friendly and innovative service in which everyone counts and every staff member management one – point agenda.

2.3 Organization Structure Chart



CHAPTER THREE

3.0 Safety In Electrical Installation

❖ **Personal Safety**

- Wear safety equipment like protective shoe, google etc.
- Wear gloves when handling rough materials
- Keep hair short or wear a cap

❖ **Safety Tools**

- Use the correct tools for the job
- Use a tools box for carrying the tools
- Keep tools in boxes when not use

3.1 Electrical/Electronics Tools And Their Uses

The company has an Electrical Technician that make use of the following instruments in performing their operations:

- Fishing Tape
- Pliers
- Screwdrivers
- Electrical Insulator Tape
- Hammer
- Measuring Tape
- Hacksaw
- Insulator or Rubber Glove
- Bending Spring
- Draw Wire
- Tester
- Ladder
- Drilling Machine
- Line

3.2 Uses Of The Above Tools

- **Fishing Tape:** Is a tool used by electrical technician to draw wire inside a pipe conduit wiring.

- **Pliers:** Is a hand tool used to hold objects firmly and at same time use to peel and cut wire to desire length
- **Screwdrivers:** Is a tool for driving screw (to open electrical object like garden light, fence light when fixing)
- **Electrical Insulator Tape:** Is a type of tape used to insulate electrical wires and other materials when wiring installation.
- **Hammer:** Is some aspect in an electrical field, hammer is use to nail some electrical equipment that cannot stand or hang on their own.
- **Measuring Tape:** Is used to measure height and length of switch and outlet.
- **Hacksaw:** Is used to cut pipe and other strong electrical materials that needs to be cut.
- **Insulator or Rubber Glove:** It stand as hand resistor for worker i.e defend workers from electrifying
- **Bending Spring:** For bending pipe where it is needed
- **Tester:** It is used to know if there is current in a particular junction when wiring of a building.
- **Ladder:** It is used to climb high place when fixing some electrical accessories like drop light, spot light (POP light) etc.
- **Drilling Machine:** It is used to drill hole where it is needed.
- **Line:** It is also known as draw wire which is to draw wire inside the pipe or tube.

3.3 Types Of Wire Used

- 1.5mm
- 2.5mm
- 4mm
- 6mm

3.4 Uses Of The Wire Stated Above In Electrical Installation

- 1.5mm - Lighting
- 2.5mm – Lighting, sockets
- 4mm – Cooker control unit
- 6mm – Air conditioner (A.C), Cooker control unit

3.5 Pictures Of The Tools Used In Electrical Workshop

Chisel

Tape Rule

Hammer

Hand Saw

Hand Glove

Nose Plier

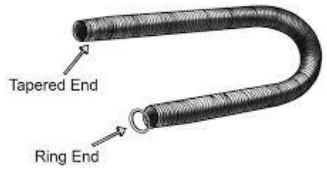
Plier

Reading Meter

Screw Driver

Soldering Iron

Tester



Spring

CHAPTER FOUR

4.0 Wiring System

Wiring system can be defined as the insulated conductors used to transfer electricity from a junction to another.

4.1 Types Of Wiring System

There are three groups of wiring system commonly used in Nigeria namely:

- Surface/P.V.C. wiring system
- Conduit wiring system
- Trucking wiring system

❖ **Surface Wiring:** This is a type of wiring system that includes running an insulated wire of 1, 2, or 3 cores on wall when doing the wiring installation of a building. It is the most commonly used in domestic wiring.

Advantages Of Surface Wiring

(i) It does not require too much of money unlike conduit

(ii) It save time

(iii) Easy to amend when it is faulty

Disadvantages Of Surface Wiring

(i) It is not as clean as conduit wiring system

(ii) Delicate for children

(iii) Damage easily

❖ **Conduit System:** In an electrical installation the word conduit means metal tube or non – metal tube. It is commonly used in big houses, offices, government houses, banks, eatery etc.

Conduit wiring system is therefore describe as the process of running single core cable through a tube or pipe from junction to another when doing a wiring installation of a building.

❖ **Half conduit**

❖ **Full conduit**

In half conduit wiring system, the wire is been connects over the ceiling like that of surface wire pass to the electrical accessories (switch, lamp holder, socket,

A.C socket and cooker unit) used in the installation are run inside the pipes which cannot be seen outside the wall.

In full conduit wiring system all the cable used are run inside the pipe including those ones on the ceiling, it is neater than half conduit.

Advantages Of Conduit Wiring System

(i) It is a clean wiring system

(ii) It does not damage easily

(iii) It is save from children reach unlike surface wiring

Disadvantages Of Conduit Wiring System

(i) It cost a lot of money

(ii) Not easy to amend when it is faulty

(iii) It does not save time

- **Trucking Wiring System:** This type of wiring system is use where numbers of cables are required to be run together in a single conduit (i.e many cables in pipe or tube).

Advantages Of Trucking Wiring System

(i) Limit the cost of running many supply cables

(ii) Prevent the danger of hazard fire

Disadvantages Of Trucking Wiring System

(i) Expensive

(ii) Not suitable for most building

4.2 Different Between Surface And Conduit Wiring System

Cable used in surface wiring system exposed outside while cables used in conduit wiring system did not.

4.3 Electrical Accessories Needed In Surface Wiring System

These are electrical materials used in surface wiring installation of building.

- **Patress:** It serves as the box that holds switch and socket
- **Junction Box:** It is a box connecting two or more wire together
- **Gang Switch:** It is use for controlling some electrical accessories e.g bulb, cooker, wall bracket etc and they have different gang (1, 2, and 3).
- **Clips and Nails:** It is used for holding the cable firmly on the wall.

- **Lamp Holder:** It is a devices used for holding the lamp or bulb
- **Socket outlet:** It is a device where appliance is plug
- **Pipe:** It is a tube of different dimension (e.g 20 or 25mm) through which the cable is being passed.
- **Knife Change Over Switch:** It is used for switching current from generator to PHCN.

4.4 Wire Join

Wire join is the connection of two or more wire at a particular point to give a desire length or to circuit current through one another.

4.5 Types Of Wire Joint

(i) Marry joint
(ii) Britalian
(iii) T-joint
(iv) T-twisted joint
(v) Telegraph joint
(vi) T-marry joint

4.5 Electrical Accessories Needed In Conduit Wiring System

The electrical accessories used in conduit wiring is almost the same thing with those one used in surface wiring, it is just that there are something that are included and excluded in conduit wiring which are;

Pipe is included: It is an electrical accessories that wire passes through during conduit installation.

- **2, 3 and 4 ways box:** It is used when laying pipe in conduit wiring depending on how many ways needed.
- **Amour Cable:** It is a kind of big cable wrapped with helical tape for mechanical protection.

4.6 When Choosing A System Of Wiring For A Building, The Following Point Must Be Put Into Consideration

i. **Neatness of the finish job:** To see if a particular wiring system chosen for a building will be clean.

ii. **Time required to complete the wiring system:** That is, if the length of time that is allocated for completion will not fail particularly urgent jobs being allocated by government.

iii. **The durability of the installation:** That is, if a particular wiring system chosen will withstand the hazard condition of usage or will last long as expected of the installation.

iv. **Cost of installation:** Cost is one of the important aspects to be considered when deciding.

4.7 Quotation Of Two (2) Bedrooms Flat

Quotation simply means what will cost a particular person in having a complete wiring installation of a particular building. Here is an example of cost of two bedrooms flat.

❖ **Living Room**

No. of wall bracket	4
No. of switch	2
No. of 13amps single socket	1
No. of 13amps double socket	1
No. of 15amps socket	1
No. TV. Socket	1

❖ **Dining**

No. of wall bracket	2
No. of 13amps socket	1
No. of switch	1
No. of P.O.P light	2
No. of 13amps socket	1

❖ **Kitchen**

No. of 13amps socket double (twins socket)	1
No. of 15amps socket	1
No. of switch	1
Cooker control unit	1

- **Bedroom 1**

No. of wall bracket	2
Dimmer switch	1
No. of 15amps socket	1
No. of 13amps single	2

- **Bedroom 2**

No. of wall bracket	2
No. of switch	1
No. of 15amps socket	1
No. of 13amps socket	1

- **Passage**

No. of switch	2
No. of 13amps socket	1
Distribution	1
Meter	1
Change over switch	1

4.8 Erection of Electric Pole

Electric pole is mounted on the undisrupted area by digging the hole for like 30meter feet.

The electric cable will then connected to the light source. By using three (3) colour cable (Red, Black and Yellow).

During the process of mounting an electric pole. The break-out and light-out source should be inform before climbing the pole to avoid electric shock.

CHAPTER FIVE

5.0 Conclusion And Recommendations

5.1 Conclusion

The student industrial work experience scheme (SIWES) has been a great opportunity to expose and intending architects to all kind of building practices in order to upgrade their knowledge practically. It has also give student the privilege to be self employed or reemployed by the firm of management with which he/she carried his SIWES training programme.

5.2 Recommendation

Base on the experience in the areas and section company's the following recommendation is made;

(i) They should organize seminars or workshop practice as related area of discipline of trainees for better understanding of his job.

(ii) The management should oversee the welfare of the trainee and safe guards him against any industrial hazard.