TECHNICAL REPORT

ON

STUDENTS' INDUSTRIAL WORK EXPERIENCE

SCHEME (SIWES)

Undertaken at

S.A SANUSI CONSTRUCTION ENG LTD

Written by

ADEGBOYEGA DARE TEMIDAYO

ND/23/CEC/PT/0101

DEPARTMENT OF CIVIL ENGINEERING

KWARA STATE POLYTECHNIC

Submitted To:

DEPARTMENT OF CIVIL ENGINEERING INSTITUTE OF TECHNOLOGY, KWARA STATE POLYTECHNIC, P.M.B. 1376 ILORIN

IN PARTIAL FULFILLMENT OF THE REQUIREMENT FORAWARD OF NATIONAL DIPLOMA (ND) CERTIFICATE IN CIVIL ENGINEERING

DEDICATION

This report is dedicated to Almighty God, the beginning and the end, the doer of all things, who spare my life before and after the completion of this programme (SIWES). Also to my dearest parent Mr/Mrs Adegboyega for their moral and financial support toward my success and also to all my friends in **S.A SANUSI CONSTRUCTION ENGR LTD** I pray that you will all reap the fruit of your labour.(Amen).

CERTIFICATION

This is to certify that this report was compiled by **Adegboyega Dare Temidayo** with Matric Number **ND/23/CEC/PT/0101** a student of Civil Engineering Technology Department, Institute of Technology (I.O.T) Kwara State Polytechnic Ilorin, Kwara state on the completion of the Student Industrial Work Experience scheme (SIWES**).**

_____ _____

SIWES CORDINATOR **DATE**

_____ _____

HEAD OF DEPARTMENT **DATE**

ACKNOWLEDGEMENT

My greatest thanks go to Almighty God for making this programme (SIWES) of four (4) month a success for me and for spearing my life till date. He is the only God and the greater God. I promised to serve him till life comes to an end by His grace.

My sincere appreciation also goes to my parent Mr/Mrs Adegboyega for their support and encouragement, both moral and financially throughout the successful completion of the programmes.

My appreciation also goes to the entire lecturers and staff both teaching and non-teaching staff of Civil Engineering Technology Department for long they have been supporting and guiding us. Thank you all and my Almighty God will be with you all (Amen).

And to the entire staff and management of **S.A SANUSI CONSTRUCTION ENGR LTD.** I thank you all for your support in making my four (4) months stay a worthwhile. I Love you all.

PREFACE

This booklet contains the details of activities and experience undergone during my four (4) months Student Industrial Work Experience Scheme, also known as SIWES which was held at of the experience and knowledge acquired during the programme was written in this report which is basically on construction, which is also essential for the fulfilment of National Certificate. It has exposed me to the use of various tools whose operation techniques work only but theoretically explained in the lecture room. I thank the National Board of Technical Education for the introduction of the Student Industrial Work Experience Scheme (SIWES) programmed to the school of learning.

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CHAPTER ONE

1.0INTRODUCTION

1.1INTRODUCTION TO SIWES IN NIGERIA

Student Industrial Work Experience Scheme (SIWES) is said to be an integral part of some degree and diploma programme in institution of higher learning in Nigeria, aimed to expose and prepare student for the industrial work situation they are likely to meet after graduation.

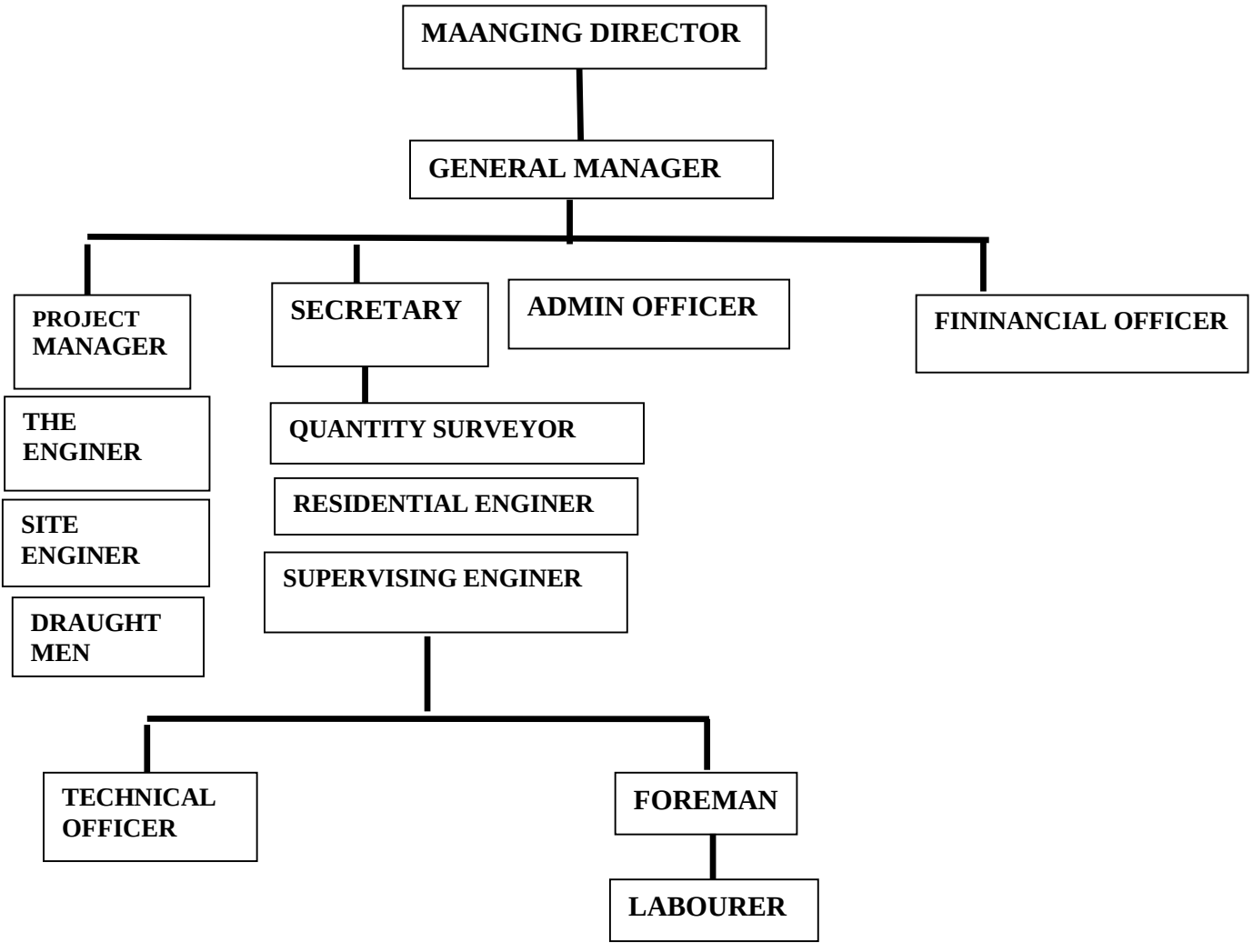
The scheme also affords the students an opportunity to familiarize and expose themselves the needed experience in handling equipment and machinery that are not available in their institutions. Before the establishment of the scheme, it was of great concerns to the industrialists that graduate of higher institution lacked adequate practical background studies preparatory for employment industries. The programme was introduced in year 1973/1974 to acquaint the students with the skills of handling employer's equipment and machinery. The Industrial Training Fund (ITF) has accepted to bridge the gap between theory and practice. The SIWES programme was effectively taken over by the ITF in 1985 with the fund being body solely bone by the government to provide adequate funds to the industrial training.

1.2AIM AND OBJECTIVES OF SIWES

1. To broaden the knowledge of student.
2. To prepare students for the industrial work, they are to meet after graduation.
3. To help student at work method and techniques in handling equipment and machinery.
4. To prepare students by applying their knowledge to real work situation and thereby bridging the gap between theory and practice.
5. To provide an avenue for the students in hog her institution to acquire industrial skills and experience relating to their course of study.

CHAPTER TWO

2.0 THE ORGANISATION CHART



CHAPTER THREE

3.0 WORKDONE

3.1 BUILDING DESIGN

Building design is refers to as the broadly based architectural. Engineering and technical application to the design of building, all building project require the services of a building designer, typically a licensed architect or structural engineer. Smaller, less complicated project often do not require a licensed professional, and the design of such project is often undertaken by building designers, chaftpersons, interior designers (for interior fit-out or renovation) or contractors. Larger, more complex building requires the service of many professionals trained in specialist discipline, usually coordinate by the architect

3.2 BUILDING CONSTRUCTION.

Building system construction starts with planning, design and financing and continue until the structure is ready for occupancy.

Building construction: this is the process of adding structure to real property or construction of building. The vast majority of building construction job are small renovations, such as addition of room of renovation of a bathroom.

BUILDING CONSTRUCTION OPERATIONAL SAFETY:

Construction can be particularly hazardous. Personal protective equipment, fire safety, electricity safety, and other precaution are essential for safe construction work. Those are the guideline to follow when visiting or working at construction sites:

- Do not walk, stand, or work under suspended load, be sure to crib, block, or otherwise secure the load as soon as possible.
- Avoid placing unusual strain on equipment or materials.
- Be prepared for unexpected hazards.

BUILDING CONSTRUCTION PROCESS

This involves the following:

1. Excavation
2. Foundation
3. Flooring
4. Block work
5. Casting
6. Roofing
7. Plastering
8. Painting

3.3 MACHINERY AND TOOLS

Is major issue which grants work done to optimum satisfaction? Those machinery and tools are used to access work of site for construction. Each with different function. For example digging is carried out in two methods:

a. Mechanically e.g, excavator
b. Manual e.g. digger

EXAMPLE OF TOOLS AND MACHINE USED IN BUILDING CONSTRUCTION

SHOVEL

HAND TROWEL

HEAD PAN

SPIRIT LEVEL

BULDOZER

- Loader
- Mixer
- Plumb bob
- Chisel
- Trowel
- Measuring tape
- Carpentry pencils
- Angle
- Vocal vibrator
- Rammer
- Straight edge
- Line

3.4 FOUNDATION

A foundation may describe as that part of a structure which is in direct contact with the ground to which the weight of the structure and other loads on the structure are transmitted.

TYPE OF FOUNDATION

1. Strip foundation
2. Pad foundation
3. Raft foundation
4. Pile foundation

1. **Strip foundation**: This is indicating as columns bed of concrete about thickness of 225mm.it is a concrete structure, which runs along the entire perimeter of the house. These foundations of construction under all load-bearing walls, maintaining the same basic cross-sectional area

STRIP FOUNDATION

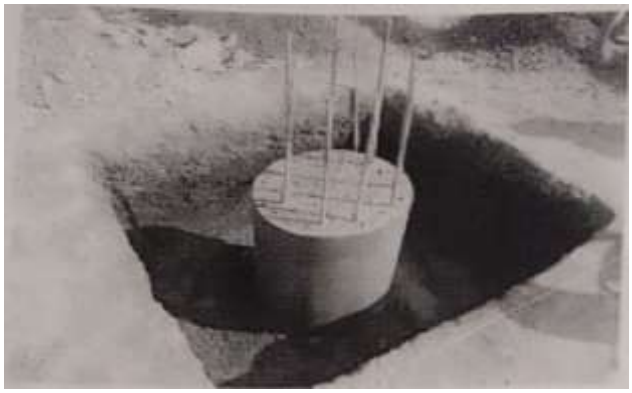
2. **Pad foundation**: These are isolated foundation usually of reinforced concrete. They support concrete, steel columns, piers or pillar in frame building. They are generally shallow foundations, but can be deep depending on the ground conditions.

PAD FOUNDATION

3. **Raft foundation:** Is the one of concrete that is suitably reinforced and up to 300mm thick which covering the entire area of the building and may extend beyond it. Sometimes area covered by raft may be greater than the contact area depending on the bearing capacity.

RAFT FOUNDATION

4. **Pile foundation:** It is apply and used when the building are construct on clayey or soft soil. The piles enable the builder to have the weight of the building carried by ground and below the poor top soil. They are principally used to transfer the loads from a superstructure, through weak, compressible strata or water onto stronger, more compact, less compressible and stiffer soil or rock at depth, increasing the effective size of a foundation and resisting horizontal loads.



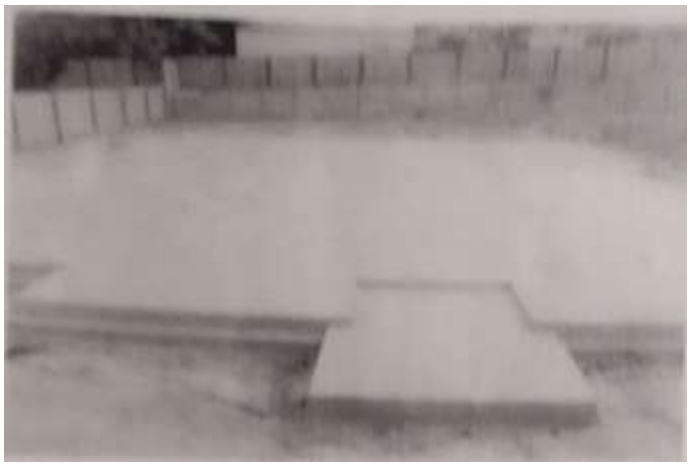
PILE FOUNDATION

PURPOSE OF FOUNDATION

- To sustain the deadload of the building as well as all other loads super imposed on it.
- To transmit these loads to the sub-soil and distribute them over an area of bearing surface to ensure even settlement of the structure.
- To protect the surface from drainage due to movement of the soil which is caused by shrinkage or swelling.

3.5 FLOOR SLAB

Concrete slab floor comes in many forms and can be used to provide great thermal comfort and lifestyle.



STEPS INVOLVED IN CASTING CONCRETE FLOOR SLAB

Whether casting concrete for foundation footings to support a simple timber structure, or for a solid slab that will form the floor of a garden building to be built from wood, the principle are exactly the same.

- Build the foundation walls on concrete and allow the molter to set, fill with hard core and sand, moisten and compact with a punner or roaming tool, leaving about 75mm of block wall above the fill.
- Spread polythene over the hardcore, overlapping all joints by 100mm.this damp proof membrane form a moisture barrier and is an essential measure to take against rising damp.
- Working in batches, mix sufficiently cement with sand and 19mm stones in the ratio of 1:2:3 and enough water to make it workable, pure the mix over the plastic up to top of the block wall to form the slab.

Use straight edge length of wood to compact and level the concrete.so that it meet the top of the foundation wall.

3.6 BLOCK WORK

Brick and blocks are component of durable massory construction in which uniform shape individual unit are laid in courses with mortar as the bed and bidding material they consist of high mass material with good compressive strength formed into unit that can be lifted and handle by a single worker.

- The mixture ratio should be 1:6(1 cement, 6 fine aggregate) for a wall of 9inches.
- The cement, sand and water mixture should minimum within two hours.
- The joint between the blocks should not be one above the others.

- At the end of the day, the length of the wall should end at an angle of 45°.

PROCEDURE FOR SETTING BLOCK WALL FOR SUPER STRUCTURE

After laying the foundation concrete, wall construction commences according to the setting out plans. The common tools required for wall construction include:

1. Trowel
2. Tape
3. Spirit level
4. Straight edge
5. Line
6. Head pan
7. Batten
8. Shovels

The types of block used for wall construction are:

225×225×450 =for erecting external walls

150×225×450 =for erecting external wall and partition

100×225×450 =for erecting petition walls only

102.5×215×60brick =for erecting external and petition walls

Other decorative blocks are required for fancy work only

The most important aspect of block laying are:

- Lining = straightness of wall
- Level = through horizontal surface
- Plumbing =through vertical surface

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3.7 PLASTERING

Plastering is the work used for covering rough surface of building component such as: walls and ceilings with a coat of plaster to form a smooth and durable surface, it is carried out for beauty, durability and resisting rain penetration.

PLASTERING METHOD

PREPARATION OF SURFACE: all the joint of the block work should have been raked out properly during block work construction itself. Dust, loose mortar etc. must be thoroughly washed with water, clean and kept wet before the work commenced.

PROCEDURE FOR PLASTERING:

Ceiling plaster should be completed before commencement of wall plaster, plastering is started from the top (say left hand corner) and work down towards the floor. To ensure even thickness and level surface, guide point and first set on the block work, for this purpose, guide plaster about 15cm x 15cm in size is first applied at not more than 2m interval horizontally and vertically to serve as guide, they are level in the plane of finish plaster surface. After this guide plaster has set, the plaster mix is then; laid on the wall between the gauge with trowel slightly more than the specified thickness. This is beating with wooden straight edge thoroughly, filling the joint and leveled across the gauges with small upward and sideway movements. Finally the surface is finished off with a trowel or float sandy granular texture. Excessive trowelling should be avoided. All corners, angle, junction etc. is carefully finished with proper tools. The surface levels are tested with a straight edge not less than 2.5m long and with plumb bobs.

3.8 SETTING OUT

A setting out survey involves the marking out of any physical feature that appears on an engineering plan, in is correct position on the ground. These surveys are normally

required during the construction of Roads, Pipelines. Concrete frames, Housing developments and many more.

3.9 EQUIPMENT USED IN SETING OUT

SITE PLAN: This show the relationship of the building to the site boundaries. roads, and building.

STEEL SQUARE: It is made of iron or metal to set right angle i.e triangulation.

HAMMER: This is use to drive the peg and the nail.

TAPE RULE: This is used in measuring the distance and also used in setting out right angle triangle by Pythagoras theorem 3:4:5.

BUILDING LINE: These line usually distance that must be maintained during the proposed building and the site boundary.

PEG: This is use for marking out and fixing lines.

LEVELLING STAFF: Staff is used for ordinary leveling work, it is sectional and are used for taking measurement in the vertical direction.

3.10 STEP IN SETTING OUT

The first thing we need to establish is a parallel lines, we will assume for the sake of this article that we have an existing building close to the proposed new structure. These lines should be offset from the building to prevent any possible snagging of the string lines; in this case i have off set the lines 500mm.This line should then be established with the use of a stake at each end and the line should be fixed at each point. Pleasure ensure the line is very tight as this will prevent a false reading if the weather conditions are very windy

STEP 1: We have the parallel lines established we can refer to the drawing to find the distance required from these lines to comply with your planning permission and we can put in our first pin as point A

STEP 2: We can measure out along our parallel line using the off set of 500mm to establish position B and we can put in another pin.

STEP 3: A little more work to establish point C. For this we will need our 2tapes, you will need to work out the diagonal measurement from point A to point B this would be done using **the Pythagorean Theorem. Once** you have this measurement established you can extend your tape from position A to position **B** until you reach the measurement, then extend your other tape from position B until the 2 tapes exactly cross at the required measurements, this will establish position C and a pin should be driven into the ground.

STEP 4: We have to repeat the process of stage 3. Using the diagonal measurement you have established take your tapes and run them out from position Band C until they exactly cross on your tapes at the established measurements and drive a pin in at position D. Now we have a box which is bigger than an actual building to allow for a concrete toe which is explained in the picture below.

STEP 5: Now we have 4 pins in the ground establishing the outside of our dig, you should get these lines very close to the ground without being snagged and either run a line of sand on the lines or use a ground spray paint.

CHAPTER FOUR

4.0 EXPERIENCE GAIN

4.1SPECIFIC INVOLVEMENT AT THE COMPANY

1. I gained experience on preliminary work on site
2. I gained experience on how to clear site
3. I gained experience on how to mix concrete
4. I gained experience how to identify sizes of reinforcement
5. I was taught on how identify types of foundation
6. I gained experience on different types of tools in building construction
7. I gained experience on how to place concrete
8. I gained experience on how to do strip foundation

CHAPTER FIVE

5.0 CONCLUSION

This report was based on the successful Industrial Training I undergone under **ENGR OLANREWAJU S.A** the site engineering at of **S.A SANUSI CONSTRUCTION ENGR LIMITED** I will like to advice the Government to continue to mandate this program in all higher institutions in Nigeria.

5.1 RECOMMENDATION

This report is purely based on the experience I had during the course of the training. I therefore recommend that of **S.A SANUSI CONSTRUCTION ENGR LIMITED** is a better place for students in all tertiary institution to undergo SIWES program. I also recommend that Government should try as much as possible to help the students in securing an industrial training placement.