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

HELD AT

ULTRA SB HOMES and PROPERTY,

OPPOSITE FIRST BANK SURULERE ILORIN.

SUBMITED BY:

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SUBMITTED TO

THE DEPARTMENT OF CIVIL ENGINEERING, INTITUTE OF TECHNOLOGY (IOT), KWARA STATE POILYTCHNIC, ILORIN, KWARA STATE

IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR AWARD OF NATIONAL DIPLOMA (ND) IN CIVIL ENGINEERING

FROM AUGUST TO NOVEMBER 2024

PREFACE

This is a report of four months industrial training which was done as part of the requirement needed for the award of national diploma certificate which was embarked upon by the technical student after their first year of stay in school.

It is also done to enable the student's to be exposed the practical aspect of their course of study and write down what he/she has gained during the training.

The program is aimed at correcting the incompetence in the school leaving the scientific and technical in country.

DEDICATION

This report is dedicated to the Almighty Allah, the Beneficent, the merciful, the cherisher of the universe, the uncreated creator of all creatures and the most knowledgeable who seek knowledge just from himself for giving me the opportunity, privilege an understanding to participate in the student industrial work experience scheme (SIWES).

I also dedicate this report to my amiable parent Mr. and Mrs. Nurudeen for their financial support during the course of the program. May Allah continue to bless them (AMIN).

ACKNOWLEDGEMENT

I acknowledge with sincerity the Almighty Allah. He has been in always faithful, caring, providing, sustaining, guarding and just so good to me. Glory honor and adoration be unto Almighty Allah.

My unalloyed thanks and appreciation goes to my parent MR & MRS Nurudeen for the caring and support that has been driving me throughout the duration of my training.

I also acknowledge my colleagues in the same department, Fatai, Kabir and others that are too numerous to mention. Also the efforts of my family, sister and brother.

I am also indebted to the entire staff of COMPANY most importantly the engineers on site for their contribution and support during the training, may Almighty Allah reward you abundantly (AMIN).

I also acknowledge the entire staffs and lecturers of civil engineering department. Most important my H.O.D Engr Na'Allah for their support, moral and academic impaction of knowledge.

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CHAPTER ONE

INTRODUCTION

1.1BACKGROUND

The student industrial work experience scheme (SIWES) is a skill development program being initiated by Industrial Training Fund (ITF) in the year 1973 to solve the problem of lack of adequate practical skills preparation for employment in industries by Nigerian graduates of national institutes.

The student industrial work experience scheme (SIWES) was also founded in order to expose students to industry based skills necessary for an easy transition from the classroom to the world of work, which enable students to exposed to work methods and techniques in handling equipment and machinery that may not be available in their institutions.

The scheme started with 784 students from 11 institutions with 104 suitable courses t inception in 1974. The number of students that participated in SIWES from Universities, polytechnics and colleges of education. At the end of the year 2007 was 194,890. In the year 2008, the number of the students that participated in the scheme increased to 210,390 students with over 112 suitable courses from 219 institutions.

1.2 OBJECTIVES OF SIWES

1. To provide an avenue for student in the Nigeria universities to acquire experience and industrial skills during their course of study
2. To prepare students for the work situations they are likely to meet after graduation
3. To expose the students to work methods and techniques in handling equipment and machinery that may be available in their institutions
4. To provide the opportunity to apply their theoretical knowledge in real work situation there by bridging the gap between theory and practice
5. To allow the transition phase from school to the world of working environment easier and facilitate students contact for later employment opportunity

CHAPTER TWO

BRIEF HISTORY OF THE ESTABLISHMENT

I had my student industrial training work experience scheme at Ultra sb homes and properties. For a period of four months. It is a chartered engineer and construction firm, established and registered Business Act code of 1968, and COREN. Ultra sb homes and property specializes in building construction and sales of land and properties.

At ultra sb homes and property. The services offered covers feasibility studies, technical surveys, investigation, design, engineering supervision and project management. Ultra sb homes and property have highly qualified experience in many fields of Engineering and offer services, which combine a broad technical background with objective view directed towards protecting the cost. The company stirs diligently to meet the needs of clients in both the public and private sectors using the latest and most advanced techniques in Engineering.

CHAPTER THREE

SITE EXPERIENCE GAINED

3.1 PLASTERING

PLASTERING is the process of covering rough walls and uneven surfaces in the construction of houses and other structures with a plastic material, called plaster, which is a mixture of lime or cement concrete and sand along with the required quantity of water.

3.1.1 Requirements of good plaster

- It should adhere to the background and should remain adhered during all climatic changes.
- It should be cheap and economical.
- It should be hard and durable.
- It should be possible to apply it during all weather conditions.
- It should effectively check the entry or penetration of moisture from the surfaces.
- It should possess good workability.
- PURPOSE OF PLASTERING
- To provide an even, smooth, regular, clean and durable finished

3.1.2 Cement plaster

Cement plaster combines several products like Portland cement, fine aggregates, and water. There are mainly three grades of Ordinary Portland Cement. To prepare the cement plaster mix, OPC 43-grade is generally mixed with sand in different proportions. Hence, the mix is also known as cement-sand plaster. PPC cement can also be used instead of OPC in plastering work.

How to Apply Cement Plaster?

Cement plastering is professional-grade work. Skilled workers can meet your demands for a smoother finish on surface walls. Without proper experience, workers cannot provide an elegant and smooth finish on the walls. Various kinds of tools are required to perform plasterwork. Here is a list of tools:

- Steel Brush

- Mobile scaffolds
- Aluminum section
- Wood float
- Buckets
- Wheelbarrow
- Trowel
- Plumb bob
- Spirit level
- Mixture machine

3.1.3 Procedures

Preparation of Surface Wall

- You can keep the mortar joints of the wall rough. It will help to provide an excellent bonding to hold plaster.
- Make sure the entire wall surface is roughed.
- Take measures to clean the entire wall surface thoroughly. There should not be any grease or oil left on the surface. The cleaning can be done with a wire brush.
- If any holes or cavities are present in the wall, make sure it is covered with appropriate material before initiating plastering work.
- If the surface wall is already smooth or the wall is old, then rake out the mortar joint to a depth of around 12 mm. It will ensure that the bonding is much better.
- Wash the entire wall. Keep the wall wet for at least 6 hours before applying cement plaster.

Groundwork for Plaster

- To get a uniform finish on the wall, you can fix dots on the wall. A dot means a patch of plaster of size 15 mm * 15 mm and a thickness of 10 mm.
- These dots are fixed horizontally on the wall and then vertically at about 2 meters. It should cover the entire wall surface.
- The Plumb bob tool can check the verticality of dots, one over the other.

- After the dots are fixed, vertical strips of plaster, also known as screeds, form between them. These screeds are used as a gauge for maintaining the even thickness of plasterwork.

Applying Under Coat or Base Coat

- For brick masonry units, the thickness of the first coat of plaster is around 12 mm. For concrete masonry, it can range between 9 – 15 mm.
- The ratio of cement and sand for first coat plaster can vary from 1:3 to 1:6.
- The screeds on the wall leave spaces on the wall surface. Apply plaster between them by using a trowel.
- You can use wooden floats and straight wooden edges to level the surface.
- After leveling, leave the first coat to set on the wall. But do not let it dry completely. Now, roughen up the surface with a scratching tool to form a key to the following coat of plaster.

Applying Finishing Coat

- The thickness of the finishing coat can range from 2 – 3 mm.
- The cement to the sand ratio for the finishing coat can be 1:4 to 1:6.
- The initial coat must be adequately damped before applying the finishing coat.
- A smooth wooden float will help you gain a better finish in the final coat.
- You should make sure jointing marks are avoided by applying the coat from top to bottom at one operation.

Curing of plastering works

- After the plastering work is finished, the wall should remain damped for at least seven days by water sprinklers. It will make sure the whole surface is appropriately wet. Curing is necessary to gain enough strength and hardness.
- Gunny bags or other materials can keep the exterior wall well-damped.
- Improper curing can lead to cracks and unevenness on the surface. So, make sure proper curing methods are followed.
- Curing should be done after 24 hours of finishing plastering work.
- It is beneficial to keep a gap of seven days between the first coat and the second coat.
- Each coat should be kept wet continuously for about five days at least.
- A more extended curing period might be necessary to gain maximum strength in colder regions.

- In hotter climates, the curing process should be started as soon as the cement mortar shows setting evidence. Various types of curing methods are applied depending on the weather conditions.

3.2 EXCAVATION

Proper foundation excavation is vital for the stability and longevity of any structure. A well-excavated foundation ensures that the building can withstand the test of time and the forces of nature.

This guide provides insights into foundation excavation, providing expert insights and best practices to help you achieve the best results.

3.2.1 Types of Foundations

Before starting the excavation process, it's essential to understand the different types of foundations:

Shallow Foundations

Shallow Foundations are suitable for smaller structures with lighter loads and stable soil conditions. Examples include slab-on-grade and spread footings.

Deep Foundations

Deep Foundations are necessary for larger structures, heavy loads or poor soil conditions. Deep foundations transfer the load to more stable soil or bedrock. Common types include:

- Piles: Driven deep into the ground to provide support
- Caissons: Drilled shafts filled with concrete
- Drilled shafts: Similar to caissons but typically larger in diameter

3.2.2 Excavation Equipment

A bulldozer and large work truck move across a worksite

Having the right equipment is crucial for efficient and safe foundation excavation. The most common excavation equipment includes:

1. Excavators: Excavators are versatile machines that can dig, lift and move soil and debris. They are ideal for larger excavation projects and can handle various tasks.
2. Backhoes: Smaller than excavators, backhoes are perfect for digging trenches and holes in tighter spaces. They offer more precision and maneuverability than larger equipment.
3. Bulldozers: Used for grading and leveling the site, bulldozers are powerful machines that can efficiently move large amounts of soil and debris.
4. Skid Steers: Compact and maneuverable, skid steers are excellent for working in tight spaces and handling smaller tasks, such as moving materials or backfilling.

3.2.3 Step-by-Step Excavation Process

The foundation excavation process itself involves several key steps:

1) Set out the Foundation Layout

Use surveying equipment to accurately mark the foundation's boundaries and elevations, ensuring proper placement within the lot layout.

2) Determine the Excavation Depth

Consult the foundation design to determine the required excavation depth.

3) Excavate in Layers

Remove soil in layers, ensuring each layer is level and stable before proceeding. Use the appropriate equipment, such as excavators and backhoes, to remove soil and debris efficiently

4) Undercut for Foundation Soles

Excavate additional depth for foundation soles, which provide extra support and stability.

5) Level and Grade the Site

Use bulldozers and skid steers to level and grade the excavated area as needed, creating a smooth and even surface for the foundation construction.

Using the right equipment and following these steps ensures you complete your foundation excavation safely, efficiently and to the highest standards.

Remember to work with experienced professionals who understand the intricacies of the excavation process and can guide you through each step, from site preparation to backfilling and compaction

3.2.4 Quality Control, Inspections and Safety Considerations

1. Ensuring the highest workmanship, safety and compliance standards is essential for a successful foundation excavation project. To achieve these goals, implement a comprehensive quality control plan that includes:
2. Regular inspections by qualified professionals during the excavation process and before concrete placement
3. Identification of potential hazards such as underground utilities, unstable soil or heavy equipment, and appropriate measures to mitigate risks
4. A comprehensive safety program that includes training, hazard communication and regular safety meetings
5. Proper use of personal protective equipment (PPE) such as hard hats, safety glasses and steel-toed boots by all workers

3.3 SITE CLEARING

The process of site clearance is generally undertaken as part of enabling works, carried out to prepare a site for construction. It involves the clearing the site to allow other remedial, treatment or demolition works to take place before the actual construction works can begin.

It involves clearing a site of any machinery or equipment, unwanted surplus materials, rubbish, and so on. Site clearance may also involve clearing away vegetation and surface soil, and levelling and preparing the ground for the planned construction works. Care should be taken to ensure that there are the correct approvals in place, particularly for trees which may be protected.

Clearing a construction site generally depends on the size of the area, the type of land-clearing operations deemed necessary, and the type of waste found on

the site. The rate of work also depends on the resources used such as machinery and human manpower

3.3.1 5 Major Site Preparation Tools and Equipment

Some site preparation tools and equipment include;

1- Compactors

You may have seen this particular machine on the road before, especially when a road construction work is on-going. This particular building site tool used in site preparation to level and compact the ground, and not just any ground but the ground that will serve as the foundation for the building. The ground that will help as the foundation needs to be compact for it to be suitable for construction.

If it is not compact enough, it will eventually become loose, and this will make any building that stands on agree with the saying: built on sinking ground. The compactor will make the foundation ground firm or tightly bound.

2- Wheelbarrows

Almost everyone would have seen this particular tool. Every construction site has a wheelbarrow present. The wheelbarrow is used to moving loads from one place to another in the construction sites. Loads like cement are needed in the construction site, but they are always kept in a cool dry place, which is still away from the construction site.

The wheelbarrow can be used to haul cement from the store to the construction site.

3- Bulldozer

This equipment is used to move unwanted materials from the surface of the ground. Unwanted materials like heavy pieces of trees that cannot be lifted with the hands are moved away using a bulldozer.

The bulldozer always moves a large amount of dirt from the surface of the ground. The bulldozer helps to create a surface that is free of unwanted materials.

4- Backhoe Tool for Land Preparation

The backhoe works synergistically with the bulldozer. While the bulldozer does more of pushing unwanted materials, the backhoe pulls up or digs out these unwanted materials. Think of it as a big hoe. You will always find these mechanical tools and equipment in building construction site.

5- Lever

This land preparation equipment is used to know if a surface is balanced or levelled. The foundation of a building cannot afford to be sloping, it must be levelled. This equipment will help you achieve that.

If you want to start new building construction, you do not have to bother yourself about these building site tools and equipment. Those offering site preparation services will provide them.

CHAPTER FOUR

4.1 RECOMMENDATION

1. I would recommend that the kwara State polytechnic should improve the school by assisting the SIWES student with computer and modern technology and it would lead to create development of the school
2. I would recommend that the department of Civil Engineering in kwara State should expose student to practical skill and allow them to practice until they understand it perfectly well.

4.2 CONCLUSION

Student Industrial Work Experience Scheme is very Essential for all student to be able to understand what their cause of study will present to them after graduation and also learn beyond what you they will be able to learn in school.

SIWES is really helping student a lot by also allowing student to connect with people that are already practicing in the field. All thanks to the Government, Kwara State Polytechnic and my Department.

Reference

- Kwara State Polytechnic Students SIWES Manual