REPORT ON
STUDENTS INDUSTRIAL WORK EXPERIENCE SCHEME

(SIWES)

HELD AT
INTERNATIONAL INSTITUTE OF TROPICAL AGRICULTURE (IITA)
P.M.B. 5320, OYO ROAD, IDI-OSHE, IBADAN, OYO STATE, NIGERIA

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SUBMITTED TO
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IN PARTIAL NATIONAL FULFILMENT OF THE REQUIREMENT FOR AWARD OF DIPLOMA (ND) CERTIFICATE IN BUILDING TECHNOLOGY

HELD BETWEEN
SEPTEMBER - DECEMBER, 2024

DEDICATION

This report is dedicated to Almighty God, the uncreated creatures that create creature in a creative manner for His protection and guidance.

I also wish to acknowledge the effort of my Parents Mr and Mrs Busari for their utmost support.

ACKNOWLEDGMENT

My profound gratitude goes to Almighty God for giving me grace, strength and seeing me through the entire period of the SIWES programmes, all praise and adoration goes to Almighty God as well for His great protection and blessing over me before, during and after my period of attachment.

I give thanks to my parents Mr. & Mrs. Busari for their support morally and financially, may God continue to shower his blessing on them.

My sincere gratitude goes to the staffs and all other personnel I came in contact with at one point or the other for welcoming me into the various units with open hands.

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CHAPTER ONE

1.1 Introduction to SIWES

The Student Industrial Work Experience Scheme (SIWES) exposes students to industry based skills necessary for a smooth transition from the classroom to the world of work. It affords students of tertiary institutions the opportunity of being familiarized and exposed to the needed experience in handling machinery and equipment which are usually not available in the educational institutions and seeing firsthand the practical experience of some theoretical knowledge gained in the course of study.

Participation in SIWES has become a necessary pre-condition for the award of Diploma and Degree certificates in specific disciplines in most institutions of higher learning in the country, in accordance with the education policy of government.

1.2 Background to the SIWES

The Student Industrial Work Experience Scheme (SIWES) is an initiative which was established in 1973 by the Industrial Training Fund (ITF) to help bridge the gap between acquired classroom education and skills necessary for work in the industry.

Before the inception of the scheme in 1973, there was glaring evidence that inadequate practical exposure of students in tertiary institutions posed serious challenges to both the quality and standard of engineering and technological education in our nation. This resulted in half-baked engineering graduates who needed to undergo a form of training (Industrial Training) to be suitable for employment in industries and firms.

In order to forestall this threat that could bring about industrial regression, the Federal Government through the Industrial Training Fund (ITF) which was established by decree 47 of 1971 introduced the Student Industrial Work Experience Scheme (SIWES) in 1973.

SIWES exposes students to machines and equipment, professional work methods and ways of safe guarding the work areas and workers in industries and other organizations. It helps the student to know the link between what is learnt in the

university and what is actually practiced on site. It further helps students to appreciate their field of study better, thereby also determining which area of specialization to go into to contribute to technological development of this nation.

The scheme involves the students, the universities and the industry (employers). It is funded by the Federal Government of Nigeria and jointly coordinated by the National Universities Commission (NUC) and the ITF.

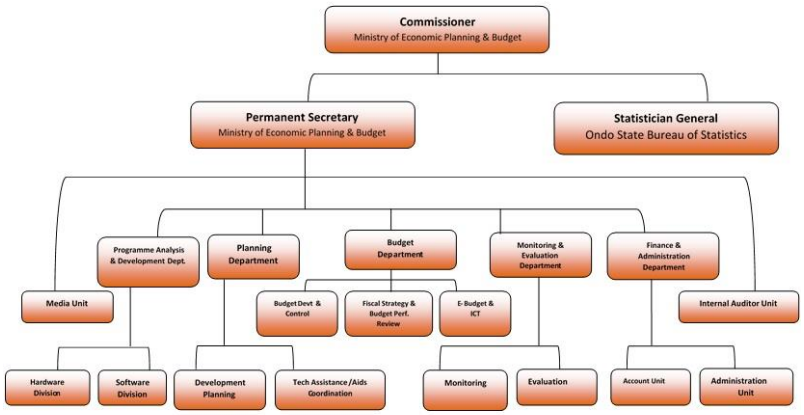
SIWES orientation is usually done to intimate students with the rudiments of industrial training before they are being employed. At the end of the industrial training (IT), successful students whose log books were verified and approved by ITF officials are paid SIWES severance allowance.

1.3 Objectives of SIWES

i. Provides the student with an opportunity to apply their theoretical knowledge in real work situation thereby bridging the gap between theory and Practical.
ii. Provides an avenue for students in tertiary institutions to acquire industrial skills and experience in their course of study.
iii. Expose students to work methods and techniques in handling equipment and machinery that may not be available in universities.
iv. Familiarizing the student for the working conditions they are likely to meet after graduation; and
v. Make the transition from the university to the world of work easier and thus enhance student's contacts for later job placement.

CHAPTER TWO

2.1 Organizational Structure of the Organizatio



2.2 Personal Safety

i. It is advisable for all construction workers to wear protective equipment
ii. Drinks or drugs should not be taken while work is going on
iii. All workers need to pay attention to personal hygiene
iv. The workplace may have dangerous objects so you should not play there
v. If any unsafe conditions is noticed it should be reported to your supervisors

2.3 Roles of a Quantity Surveyor

The following are roles of a quantity surveyor

i. To give preliminary cost advice
ii. To determine cost estimate of building materials
iii. To prepare bills of quantity for material used in construction
iv. Quantity surveyor assignment to sub-contractors

2.4 Roles of Building

The following are roles of a building

i. To interpret architectural drawing and specification
ii. Co-ordinate of work on site
iii. Operating and interpreting work program on site
iv. Co-ordinating labour resources, procurement and drawing of materials plant and equipment.

CHAPTER THREE

3.1 INTRODUCTION TO CASTING OF FOUNDATION BEAM

A beam is a structural element that primarily resists loads applied laterally across the beam's axis (an element designed to carry a load pushing parallel to its axis would be a strut or column).

3.2 Grade Beam Construction Process

Excavation of trenches is executed for the beams on the basis of its level. We can also construct these beams on the ground directly and in this case the ground surface is leveled and prepared. We should install a framework for grade beams.

3.3 Beam Formwork Installation Sequence and Technical Points

1. Preparing the Construction Site. ...
2. Marking and Aligning the Beam Positions. ...
3. Assembling the Beam Formwork Panels. ...
4. Placing and Securing the Formwork Panels. ...
5. Installing the Shuttering and Reinforcements. ...
6. Pouring and Curing the Concrete. ...
7. Load-Bearing Capacity.

3.4 What is the process of ground beam installation?

What does the ground beam installation process entail? Ground beams made from reinforced concrete, which rests either directly on the soil or on concrete piles or pad foundations. After site excavation and the pile or pad foundations are in place, formwork is positioned to enclose the entire ground beam area.

3.5 Beam and Plate Shoring System Benefits

ENHANCED SAFETY

Shoring systems, including beam and plate shoring systems, are used during excavations in order to reinforce trench walls and prevent cave-ins. Without the use of a shoring system, cave-ins and worker injury would be more commonplace, as would the potential risk of injury for pedestrians and those in nearby structures—if the

cave-in is large enough, it has the potential to impact wider zones, upsetting the integrity of nearby buildings or disrupting traffic near the construction site. Each of these things can lead to more damage and injury, either at the moment of the cave-in or later down the line. Worker safety is a top priority on any construction site, but especially during excavations, as these are some of the most dangerous work zones for laborers. **By utilizing beam and plate shoring, common excavation setbacks can be avoided and worker injury circumvented.**

LITTLE TO NO VIBRATION

Due to the limited number of pieces, **beam and plate shoring installation causes little vibration**. If a project requires zero vibration, the H-beams can be pre-auger-drilled to eliminate vibrations entirely.

FAST AND EASY REMOVAL

The beams and shoring plates of a beam and plate system can be removed by an excavator as backfilling takes place, **making removal fast and easy.**

MINIMAL LIQUIDATION COSTS

Liquidation costs incurred from cutoffs and damaged sheet piling is minimized with beam and plate shoring systems.

DUAL USES

The steel shoring plates used to construct beam and plate shoring systems **can also be used as trench covers or for steel road plates in other areas after the project is complete**. In addition, steel h-pile beams and steel wide flange beams are a structural steel used for many temporary applications, meaning they can be used for many different project types. As a bonus, the components of beam and plate systems can also be resold during project demobilization. There is a hot market for used steel plates, used h-pile beams, and used wide flange beams!

ADDITIONAL BENEFITS

In addition to the above benefits, beam and plate shoring offers large free-span work areas and can remain in the ground for an extended period of time. These systems

also have a wide range of excavation applications and are typically used as an alternative to side rail and tight sheeting. Beam and plate shoring is usually cheaper than other, similarly.

3.6 Compaction Work

1. Name of Work & Description

Compaction work is required after the backfilling work of the foundation of the building or any structure from a hard surface. Compaction should be done in only layers up to 300mm to 500mm for road, building, bridge foundation, etc. Compaction of backfilling work is the most important factor in the construction field. A lot of structures life depends on the compaction of backfilling material.

Types of using of Material Compaction Work

1 Soft Soil

2 Murum (Same Gravels)

3 Murum (Brown Stone Color uniform size)

4 Murum (60-100mm size)

5 Boulders: Good Compaction is Not Possible for Boulders

6 Debris: Good Compaction is Not Possible for Debris, but if gravels size will be small, then it will be possible.

2. IS Code No.

IS Code for Methods of test for Soils: IS 2720: Determination of water content-dry density relation using light compaction.

IS Code for Methods of test for Soils: IS 10074: Compaction mold assembly for light and heavy compaction test for soils

3. The Drawing Needs to Read.

Compaction work is part of Backfilling work which required the same drawing Following drawing need to read before Compaction work.

1. Building Foundation and Section Plan
2. Bridge Embankment Foundation and Section Plan
3. Plinth Section
4. Reduced Level Plan of Existing Ground
5. Plot Layout Drawing
6. Road Level Top and Bottom
7. Road The section as per Ground Level
8. Foundation Section Drawing

4. Location of Work

Compaction work can be done with the following Locations.

1. Building Foundation
2. Podium Foundation
3. Basement
4. Under Ground Water Tanks
5. Bridge Foundation
6. Culvert
7. Dam
8. Trench
9. Road
10. Bridge Embankment
11. KT Weir Embankment

5. Standard Procedure of Work (Step by Step)

Work Procedure before Start the Compaction

1. Read Plot Layout Drawing Carefully.
2. Calculate Approximate measurements to get the idea of required backfill material.
3. If compaction is proposed then 1.5 times the quantity of material is required to backfill.
4. Read Foundation drawing plan, where Footing and Raft of the building is outside then building line.
5. Calculate Outer to outer distance from foundation drawing of building or bridge structure.
6. Do site visit of Backfill material quarry. Please keep quarry distance nearest form your site.
7. Finalize material as per your requirement.

8. Finalize the rate as per your budgeted amount for backfilling work.
9. Arrange the material for testing of the Proctor density Test.

Work Procedure during the Compaction

1. Remove all the Material from Pit, or Backfilling Area.
2. Fill loose material with help of machine up to 300mm height.
3. Do not backfill murum more than 300mm.
4. Do not allow boulders in Backfill murum.
5. Do not allow any vegetation/twigs
6. Do not allow keep the boulders near RCC structure, it can be damaged RCC member.
7. Compaction must be done by first filling the excavated soils in layers of 300–500mm and tamping it with a vibrator. Till the desired level. The soil is moistened up to the optimum moisture content to establish optimum compaction and best results.
8. Barricade the area compaction area when machinery is working.
9. Check and Note down backfilled area levels with help of an Auto level.
10. Proctor Density Tests should be done at each layer.

CHAPTER FOUR

4.1 Use of Personal Protective Equipment (PPE)

Personal protective equipment, commonly referred to as "PPE" is equipment worn to minimize exposure to hazards that cause serious work place injuries and illness. These injuries and illness may result from contact with chemical, radiological, physical, electrical, mechanical, or other workplace hazards. Personal protective equipment may include items such as gloves, safety glasses and shoes, earplugs or muffs, hard hats, respirators, or cover alls, vests and full body suits.

Employers are also required to train each workers required to use personal protective equipment to know.

i. When it is necessary
ii. What kind is necessary
iii. How to property put it on, adjust wear and take it off
iv. The limitations of the equipment
v. Proper care, maintenance, useful life and disposal of the equipment
vi. Tools available on site and safety precautions.

4.2 Site Tools

- **Concrete Mixer:** Is a device that homogenously combines cement, aggregate such as sand or gravel, and water to form concrete. A typical concrete mixer uses a resolving drum to mix the components.

- **External Vibrator:** Is used to consolidate the freshly poured foundation as well as the compact surface to present concrete. It is operated on three phase

induction motor. It has fully closed structure. Also it is rugged, dependable, easy to maintain and its power and consist of four cables rubber coation. External vibration is vibrating the form work from outside.

- **Internal Vibrator:** Is vibrating the concrete from within the form work. Internal vibration is the most commonly used vibrator for concrete. It comprises a steel tube with an electric vibrating element (closed and rounded). An internal concrete vibrator is a small steel cylinder with an electrical cord at the end of the tool.

- **Hack Saw:** A hack saw is a fine-toothed saw, originally and mainly made for cutting metal. However, it can also be used on plastic, like PEX of PVC, making a hacksaw an invaluable tool for anyone regularly work with these materials.

- **Drilling Machine:** Is a power tool that is used to create cylindrical holes in a work piece. The tools bit is rotated at high speed and pressed into the work pieces to create a cylindrical hole that passes either part way.

  A drilling machine, called a drill press, is used to art holes into or through metal, wood or other materials.

- **Iron Cutting Machine:** Also called metal cutting machine tools used to fabricate parts by the removal of material, typically metal.

- **Digger:** A tool uses for digging the earth.

- **Head Pan:** is a major equipment used on a site that has a space for disposal of disintegrated masonry

- **Shovel:** a tool used for digging, lifting and moving bulk materials such as soil, gravel etc.

- **Hand Trowel:** a tool with blade for leveling, spreading and shaping substance such as cement of mortar.

- **Wheel Barrow:** used for the moving of materials (hauling) from one place to another.

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATION

5.1 Conclusion

The SIWES program has contributed positively to my exposure and training on the field of Building Technology. It has also helped me to put into practice the knowledge gain in the classroom with actual industry experience. Also to develop a initial and realistic approach to problem with their solution in the civil engineering field

5.2 Recommendations

I would recommend that the polytechnic should try to get a placement for the student by contacting all organization to admit any student for their SIWES program.

I would recommend that the polytechnic should try to give adequate supervision to the student in their place of attachment for student assessment before the completion of the program.

I would recommend that the polytechnic should encourage their student to spend their training period well and try their possible best to acquire the practical knowledge on the field.