TECHNICAL REPORT

ON

STUDENT INDUSTRIAL WORK EXPERIENCE SCHEME (SIWES)

HELD AT

S.O OLADEJI & SONS NIG LTD

NO 70/72 STADIUM SHOPING COMPLEX, IBRAHIM TAIWO ROAD, ILORIN

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P.M.B 1375, ILORIN.

AUGUST - DECEMBER 2024

REPORT OVERVIEW

The Students' Industrial Work Experience Scheme (SIWES) is a program set up by Industrial Training Funds (ITF), reinforced by the Federal Government, to assist and expose students of tertiary institutions to acquire adequate and relevant skills to be industry-ready in their various field of studies. It also exposes students to work methods and enriches their experience enough to handle equipment and machinery that may not be available in the institution. It is also aimed at nefourrking students with people from all works of life to enhance their communication skills and the ability to interact with people after graduation. This technical report is a summary of the experience gained during my Students' Industrial Work Experience Scheme (SIWES) that took place at S.O OLADEJI & SONS NIG LTD where I was given access to a lot of things like leveling instrument and other basic activities on site , where I was able to work alongside professional both on site and in the office .

DEDICATION

This report is dedicated to GOD for seeing me through and providing me with strength and good health, during the months of my SIWES program.

I would like to dedicate this report to God, to my family for their support and love, and to Kwara State Polytechnic for the amazing opportunity they've provided.

ACKNOWLEDGEMENT

My thanks go to ALMIGHTY GOD for the gift of life and also for sustenance from birth till now, and for allowing me to complete my student industrial work experience scheme (SIWES).

My profound gratitude to the entire S.O OLADEJI & SONS NIG LTD team for their constant encouragement and motivation, and special thanks to my supervisor S.O OLADEJI & SONS NIG LTD and the entire management of Engr. Yemi for the training, support, love, and cooperation they afforded me during my period of attachment.

I also say a very big thank you to my parents for their support, love, care, and prayers throughout the year. I love you.
Lastly, I say thanks to my friends and colleagues for their co-operation.

"May God continue to guide you and lead you to success".

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CHAPTER ONE

INTRODUCTION TO SIWES

1.1 HISTORY OF SIWES / ITF

The Student Industrial Work Experience Scheme SIWES was established by the Industrial Training Fund (ITF) in 1973 to solve the problem of lack of adequate practical skills preparatory for employment in industries by Nigerian graduates of tertiary institutions.

The Scheme exposes students to industry-based skills necessary for a smooth transition from the classroom to the labor world. It allows students of tertiary institutions to familiarize themselves with and expose them to the needed experience in handling machinery and equipment which are usually not available in the educational institutions, 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, by the education policy of the government. The operators include- The ITF, the coordinating agencies (NUC, NCCE, and NBTE), employers of labor, and the institutions. It is planned to supervise an occupational experience program involving practical activities conducted outside of the regular classroom and in a real industrial setup. Realizing the important role of technical education, the Federal Government reviewed the operation and funding of the scheme and made it compulsory for students majoring in technical, educational, and engineering, and applying for science programs in institutions of higher learning.

Under the Scheme, students in the Degree program undertake four months of industrial work experience. According to Evens (1971), one of the real advantages of a supervised experience program is its adaptability to change through training; students can be aware of the change method, market, and equipment necessary for a successful industrial work experience. SIWES is operated as a joint venture through the contributory activities of the following stakeholders

• **The Federal Government (F.G):** The Federal Government funds the scheme through the help of the Federal Ministry of Commerce and Industry (FMC&I).

• **The Industrial Training Fund (ITF**): This is one of the Federal Ministry of Commerce and Industrial parastatals who are responsible for the overall management of the scheme in collaboration with other stakeholders.

• **The Regulatory/Supervising Agencies**: These agencies regulate the tertiary institutions on behalf of the Federal Government to ensure the guidelines for the operation of SIWES are followed by all institutions. Examples of such are the National University Commission (NUC) and the National Board for Technical Education (NBTE).

• **The Employers**: These include members of the Organized Private Sectors (OPS) and government Establishments who provide places of Industrial Attachments for SIWES participants.

• **Tertiary Institutions**: These include colleges of Education, Polytechnics, and Universities, who are primary beneficiaries of SIWES. Their central role is to ensure the successful implementation of SIWES is apparent.

• **The Students**: Students are direct beneficiaries of SIWES since they are the recipients of the training provided through this scheme. The role of students is to fully participate in this program to acquire relevant production skills before graduation.

• **The Chief Executives Forum**: These comprise the Chief Executives of ITF, NUC, NBTE, NCCE, and OPS, who are responsible for the formulation of policies for the effective management and implementation of SIWES at the National level

1.2 OBJECTIVES OF SIWES

SIWES provides a path for students to acquire industrial skills and experience in their approved course of study. It also gets the students ready for their industrial work situation after graduating from their institution. The objectives of the industrial training work experience scheme include:

- To make the transition from school to the world of work easier and to enhance students' contacts for later job placement
- To expose students to work methods and techniques in handling equipment and machine ties in their institutions.
- To help students greatly understand the ethics and work principles required in a work environment.
- To reconcile theory work with that of practical knowledge.
- To help students practically take part in the work they have acquired from school to enhance greater skill production.

The objectives of the SIWES program are all about strengthening future employees. Such a program is a successful attempt to help students understand the fundamental principles of their future work. After passing the programs, the student can concentrate on the really necessary factors of his/her work.

CHAPTER FOUR

DESCRIPTION OF THE ESTABLISHMENT OF ATTACHMENT

2.1 S.O OLADEJI & SONS NIG LTD PROJECT BACKGROUND

S.O OLADEJI & SONS NIG LTD was formed in 2017 and located in No 70/72 Stadium Shopping Complex. True to our vision of transforming the quality of construction delivery in Nigeria, S.O OLADEJI & SONS has been growing since our very first day.

We have become an essential component of the construction industry in Nigeria with a network throughout West Africa and the Middle East. S.O OLADEJI & SONS NIG LTD specializes in industrial buildings, heavy industries, light industries, warehousing, food & beverage plants and outlets. Although we are not the largest construction company in our markets, our spotless quality record, strong working relationship with clients, and consistent adherence to deliver targets, ranks us among the top listed construction companies in Nigeria

TODAY

Today, S.O OLADEJI & SONS NIG LTD strength is its growing team of professionals applying their special talents in all engineering disciplines and project execution. Their skills, energy, motivation, and commitment can be seen at all stages of every project. Within this team, peer performance is enhanced by ongoing, specialized training in all aspects of construction and project management.

2.2 **Competencies of the Establishment**

Project management: Realistic schedules, genuine commitment, with detailed monitoring of performance

Procurement: Professional team to identify and source materials worldwide for on-time availability at project sites with the assistance of in-house logistics expertise.

Civil engineering : Design and execution of all phases of a construction project efficiently and economically.

Steel erection; The most experienced and versatile steel erection teams in Africa.

HSSE: Deeply committed to protect the health, safety and security of all employees & project stakeholders. Recognized commitment to the best-practices safeguarding the environment at site locally and regionally.

CHAPTER THREE: REPORT

1.1 LECTURE REVIEW

LEVELING INSTRUMENT

- DUMPY LEVEL
- WYE LEVEL
- CUSHING LEVEL
- TILTING LEVEL
- COOKE'S REVERSABLE LEVEL
- AUTOMATIC LEVEL

AUTOMATIC LEVEL

Introduction:

An automatic level is an optical instrument used to establish or verify points in the same horizontal plane in a process known as leveling and is used in conjunction with a leveling staff to establish the relative heights levels of objects or marks. It is widely used in surveying and construction to measure height differences and to transfer, measure, and set heights of known objects or marks.

It is also known as a Surveyors level, Builders level, Dumpy level or the historic "Y" level. It operates on the principle of establishing a visual level relationship between four or more points, for which an inbuilt telescope and a highly accurate bubble level are used to achieve the necessary accuracy.

It is usually used by contractors, builders, land surveying professionals, or the engineer who demands accurate leveling every time. Auto Levels set up fast, are easy to use, and save time and money on every job

An automatic level

PARTS:

An auto level consist of telescope with various screws to adjust the line of sight . A tripod is also used to adjust the auto level .

- TELESCOPE:
  It holds the lenses that magnify objects in the sight.

- OBJECTIVE LENS:
  It catches the object being sighted and magnifies the object.

- EYEPIECES:
  It is located and the viewing end of the telescope, it can be turned to bring the crosshairs into focus.

- FOCUSING KNOB:
  It can be turned to make object appear crisp and clear.

- LEVELING SCREW :
  It allows adjustments to be made to ensure the instrument is level.

- BASE PLATE:
  It is the area to which the automatic level attaches on the tripod.

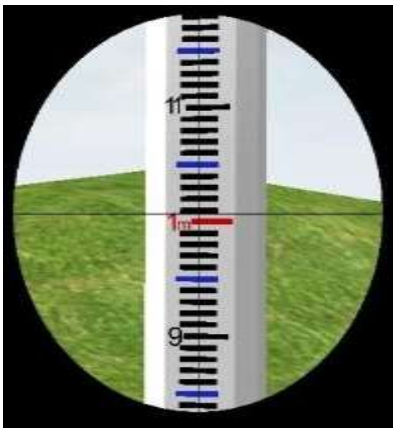
- HORIZONTAL TANGENT SCREW:
  It can be adjusted to make the instrument move left or right on the horizontal plate. It ia also known as ‘slow motion knobs’

- CIRCULAR LEVEL:
  It is mounted on the automatic level, it ensures that the instrument is at true level point.

A circular level

- TRIPOD:
  A tripod is a three-legged stand , important in providing the foundation for auto level and other leveling instruments. It is usually made up of Aluminum for the sake of lightness.

- CROSSHAIRS:
  It's a diaphragm consisting of horizontal hair and vertical hair fitted in the Telescopic Tube of the level. Staff is bisected at the intersection of the crosshair to take the reading



Crosshair

OPERATION

Mounting an Automatic Level:
Firstly the automatic level needs to be mounted on the tripod. For that purpose, the instrument is placed on the head of the tripod carefully such that the nuts under the instrument perfectly aligning with the bolts present on the head of the tripod and then the bolts are tightened with the nuts completing the mounting process.

Levelling an Automatic Level:

Once the auto level is properly mounted on the tripod it then needs to be levelled before taking measurements as unleveled instrument gives blunder readings. In order to level the automatic level a very simple but efficient enough instrument called "Circular Level" is used. Circular Level is actually a very basic and cost-effective levelling tool, it contains a small bubble floating inside a small circular glass which indicates the state of levelling of a horizontal surface or in this case an instrument on the surface. So to level, the instrument one needs to take that small bubble in the middle of the circular level by adjusting the legs of the Tripod and by moving the levelling screws carefully. When the bubble comes in the middle of the circle the automatic level will then be considered as levelled and ready to take measurements.

Focusing an Automatic Level:
After setting up the automatic level, the next step is focusing the automatic level. Firstly the telescope is aimed at the target and is roughly aligned with the target by means of "Alidade". When seen through

the eyepiece the target may look blurry but turning the focusing knob either left or right should make the object appear clearer.

Making a Reference Line*:*
After careful setup of the level, the height of the crosshair is determined by either sighting from a known benchmark with the known height determined by a previous survey or an arbitrary point with an assumed height is used.
Sighting is done with an assistant surveyor who holds a graduated staff vertical at the point under measurement. The surveyor rotates the telescope until the graduated staff is in the crosshairs and records the reading. This is repeated for all sightings from that datum. The instrument should be moved to another position within sighting distance, it is re-leveled, and a sighting taken of a known level in the previous survey.

1.2 A REPORT ON S.O OLADEJI & SON

CASTING:

Casting concrete slab is considerably crucial task in building construction and requires great planning and accuracy, in addition to proper execution sequence.

Materials and Machinery for Slab Casting

- Batching plant
- Transit mixer
- Concrete pump
- Vibrators
- Slump tray
- Slump cone and other associated tools
- Rubber hammer
- Chute and CI Pipes
- power float machine
- shovel

Slab Pre-concreting Checks

There are many checks that need to be performed prior to concreting of reinforced concrete slab:

Checking Slab Formwork

- Check whether the formwork is fixed properly or not for example sleeves and supports.
- Damaged materials employed for formwork or shutter should not be utilized.
- All formwork surfaces in contact with concrete need to be treated with shuttering oil and dampen with water sometime prior to concrete placement.
- check the level of the projected top surface of the slab and place level strips if necessary to mark the exact level.

Checking Slab Reinforcement

- Check and approve that reinforcements are fixed as per the approved drawings.
- Examine reinforcement spacing (including vertical and horizontal spacing) and cover.
- Ensure that adequate support for reinforcements are provided to prevent any movement during concreting process.
- Loose ties along the splices of reinforcement bars must be tightened again.
- Free end of binding wires shall be bended inward**.**

Other pre-concreting checks

- Ensure that workers use safety tools and equipment for example safety helmet, safety shoes, goggles, gloves, and vest.
- Safety devices and safety warnings should be provided from site entrance to the casting area.
- Check whether adequate lighting is provided in case of night concreting.

WORK PROCEDURE

1. **Providing construction joint**

The construction joint shall be pre-decided and fixed prior to start of the concreting. It is planned to have four construction joints for main building as decided. In case of major break down of the Batching plant, the additional Construction joint may be left.

2. **Production of concrete**

Stock of material shall be sufficient to start the concrete. It shall be ensured by stores/purchase depth that concreting is not stopped on account of materials. All plant and machinery are checked and made in working conditions.

3. Concrete pouring

- Proper walkways/platforms shall be arranged so that the supports of the pipeline and manpower are not directly stand on reinforcement.
- Sufficient carpenters along with supervisor shall inspect the behavior of supports below the slab during the casting.
- Extra Props shall be stocked below slab to provide additional supports in case of any failure of supports.
- Before discharging concrete from the mixer, concrete shall be inspected and acceptance shall be conducted like slump tests.
- Required number of concrete specimens shall be taken for compressive strength test and other tests.
- It is recommended to discharge the concrete within 90 minutes from the batching plant loading time.
- Compact the concrete properly by using mechanical vibrators, extra vibrator shall be available in case of any shortage or mechanical problems.

4. Finishing Concrete Surface

- Use the power float for the smooth finish surface purpose.
- The casted area or member shall be protected by placing barricade to prevent plants and machineries damaged the concrete.
- Concrete pour card shall be filled by Quality Engineer and to be submitted to the Engineer including concrete delivery notes, this task will be done whenever required.

5. Curing Concrete

The curing shall be started immediately after thumb set of the concrete laid. Hessian clothe /Plastic shall be covered over the set concrete to reduce moisture evaporation from the concrete during hardening and thus to minimize shrinkage crazy cracks. These cracks are inheriting property of the concrete specially appears during casting of flat surfaces. Final curing shall be done by ponding and stacking water for minimum period of 7 days.

CONCRETE CUBE FOR CONCRETE TEST

The purpose of a concrete cube test is to ensure that the concrete meets its expected compressive strength. If the concrete doesn't hit its design strength – or if it hasn't been tested – the supplier can't guarantee its quality. And if the supplier can't guarantee quality, then there's a big risk that the concrete might not be up for the job. It could crack, crumble or collapse in just a few months. You can only be 100% confident about the quality of your concrete if you use a supplier that cube-tests. Concrete cubes are typically made in moulds with dimensions of 150mm x 100mm x 150mm. The moulds have to meet the British Standard for testing hardened concrete (BS EN 12390-1:2000).

The concrete should be tested after 7 days and after 28 days. That's why 2 or 3 cubes are taken – so that the concrete can be measured after different lengths of time.

A typical concrete cube test follows these main steps:

- **Take a sample of freshly mixed concrete** – We take a sample of the concrete we want to test from our mobile batching unit, where it has been freshly mixed.

- Pour the concrete into 3 cube moulds – The sample concrete is poured into 2 or 3 cube moulds (depending on the customer's requirements). The concrete in each mould is then filled, levelled, compacted and tampered to BSI requirements. Each cube is taken to our temperature-controlled lab, where it is kept for 24 hours, before being cracked and put into our water tanks to cure.
- Let the concrete cubes cure – The cubes are kept in our temperature-controlled water tanks for 1–4 weeks.

Crush the cubes to test their strength – When each cube is ready for testing, it is put into a concrete crusher. This machine exerts force onto the cube until it breaks. The rate at which it crushes is measured, and this is its compressive strength.

EXCAVATION

There are many elements that make up the excavation process such as site preparation, drilling, and trenching, and it is required in the construction of roads, sewer lines, and drainage. However, the process will include:

Preparation – A professional construction company will work with a range of other services such as land surveyors before they begin any work. This will ensure that the work is planned safely and that any obstacles in the area are removed such as trees and boulders.

Excavation – This will involve excavating, drilling, or digging, but it will begin the process of moving and removing soil and rocks. They will undertake all grading and smoothing while they will remove dirt and debris. The area will be prepared in accordance with the construction project.

Trenching – Where trenches are required for foundation footings, they will undertake the process of soil removal and all other debris

Essentially, before an excavation takes place the process will follow these steps:

- Setting corner benchmarks
- Ground surveying and top levels
- Excavate the area to the agreed depth
- Mark up the cut-off levels
- Mark the boundaries of the construction site

Excavation Equipment

Backhoe Loader

The backhoe loader is the main tool that forms part of the back loader hoe. This is used to remove compact, hard material, and it can be used to lift heavy loads.

Bulldozer

If your construction project requires the removal of large amounts of rocks and soil than a bulldozer will be used. This has a large metal blade on the front that is used to push material.

Trencher

Again, if you have large amounts of earth to move then a trencher can help with this. It has large metal teeth that are made of steel and these tear into the ground, making it possible to dig trenches that can be used to lay utility pipes, cables, or drainage.

Skid-steer Loader

If part of your construction project requires work in a compact area then a skid-steer loader might be required. This can be used for digging, but it is lightweight and manoeuvrable, while it can be used with different tools.

Vacuum Excavator

If materials such as earth and debris need to be removed from a hold then a vacuum excavator can take care of the job. A large pipe is placed into the hole before materials are then sucked into a storage area located within the vehicle. We often do trench work, we have our City Sucker for compact areas, and our tracked vac for rough terrain.

Crawler Loader

Crawler loaders are used on rough terrain where the tracked chassis enables them to move with ease. Therefore, they can be used on the unstable ground while they also have the ability to excavate large materials such as rocks and heavy soil.

CHAPTER FOUR

4.1 SUMMARY OF ATTACHMENT ACTIVITIES

The student industrial work experience scheme has exposed me to more practical knowledge of site work on levelling using the levelling instruments , also more experience on excavation and casting with different grades of concrete.

CHANLLENGES

The main issue I had at work was limited time to learn. Since its just 4 months programme. I think I will catch up with it doing my Industrial Training (IT) attachment,

RECOMMENDATION

I like to use this medium to explore the Federal Government at all stages to take the SIWES program more seriously. The government should also ensure proper supervision of SIWES students so that the purpose of the program will be achieved.

The Federal Government should make adequate provisions in the annual budget for proper funding of SIWES given the potential of the scheme to contribute to enhancing the quality of the pool of technical skills available to the country.

A comprehensive and detailed directory of employers who accept students for SIWES is urgently required to facilitate the placement of students in industry.

To guarantee the quality assurance of the institution and the ITF. The ITF should ensure that the backlog in payment of students' allowance is cleared urgently to remove the negative image being created for SIWES.

CONCLUSION

My SIWES period was of immense value to me as I gained a lot of knowledge and experiences that are useful for the current and world's future technology.
And for this, I say one more time, I'm grateful to my SIWES Company, the Kwara State Polytechnic, and my colleagues as well.