A

TECHNICAL REPORT

ON

STUDENT INDUSTRIAL WORK EXPERIENCE SCHEME (SIWES)

UNDERTAKEN AT

CHINESE CONSTRUCTION COMPANY,
OLOORU, KWARA STATE, NIGERIA

COMPLIED AND SUBMITTED

BY

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ND/23/MPE/FT/0080

SUBMITTED TO
THE DEPARTMENT OF MINERALS AND PETROLEUM RESOURCES ENGINEERING

IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF NATIONAL DIPLOMA IN MINERALS AND PETROLEUM RESOURCES ENGINEERING

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DEDICATION

This work is dedicated to the Almighty God who gave me Strength and Inspiration to carry out this exercise.

ACKNOWLEDGEMENT

I owe an immense gratitude to God for bottling up in me an unquantifiable store of energy to be able to carry out this work.

I must appreciate Chinese Construction Company and my Industrial based Supervisors (…….) for their immeasurable support during the course of the four months program and whose guidelines stood as a frame on which this report is written.

I can't but mention my Institution based Supervisor who also stood solidly behind me while i was out there for the program.

Not forgotten are my Parents and friends, especially, for their keen contributions to the successful writing of this report.

I say a very big thank you to everyone for your active support and encouragement.

CERTIFICATION

This is to certify that this report was carried out by **AYINLA RIDWAN OLABISI** with matriculation number **ND/23/MPE/FT/0080**, Department of **MINERALS AND PETROLEUM RESOURCES ENGINEERING.**

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CHAPTER ONE

1.1 INTRODUCTION TO SIWES

The Student Industrial Work Experience Scheme (SIWES) is a welcome development which has contributed immensely to the building of students in the tertiary institution. Being part of the minimum academic standard in the various degree program of Nigerian Universities makes it worthy of note as most of what we were taught in school are solely theoretical which would have made transition from school to work environment a very difficult one as new intakes into workplaces may find it a difficult place and have a problem in getting acquitted with the work environment but for the SIWES which has given them the exposure required and the basic training that will really be of assistance to them. SIWES is an avenue to bridge the gap between theory and practical of Engineering and Technology, Sciences, Agriculture, Medical management and other professional educational program in the Nigerian Tertiary Institutions.

It is important to know that theoretical knowledge gotten in the four walls of the classroom is compulsory to be put into practice. This is one of the great opportunities granted in the process of Nigeria University Undergraduates undergoing the Student Work Experience Scheme (SIWES) which is to improve and widen the understanding of such student. And in the other hand to learn how work is carried out or done in various fields. And to be able to see (if any) problems that are encountered in the various area of study and by proffering solution to the problem seen. The student Industrial Work Experience Scheme is thereby established to improve the knowledge of the Universities, Polytechnics, and colleges of education Undergraduates. The program is aimed at exposing students to machines, equipment, professional work methodology and ethics aimed at bridging the gap between the theoretical knowledge gained in the classroom with real practical experiences making the course more appreciable to the students. It is funded by the Federal Government of Nigeria and jointly coordinated by the Industrial Training Fund (ITF) which was also set up by the Federal Government to facilitate the unhindered movement of the scheme towards achieving its set aims and objectives alongside the National Universities Commission (NUC). The training has been designed to take place throughout the period of the second semester of ND 2 in the Academic

sessions of the Kwara State Polytechnic, Ilorin, Kwara State and ranges for a period of 4 months during which students are expected to have gained sufficient work experience with their respective companies where they must have interned.

1.2 OBJECTIVES OF SIWES

Some of the objectives of the Students Industrial Work Experience Scheme (SIWES) include:

i. To provide avenue for students to acquire industrial skills and experience in their course of study.

ii. To expose students to work methods and techniques in handling equipment and machineries that may not be available in their respective institutions during their course of study.

iii. To enhance and encourage employer‘s involvement in the educational process and preparation of students for employment in industries.

iv. To provide students with opportunity to apply the theoretical knowledge in real work situations, thereby bridging the gap between the university theoretical work and practical work.

v. To expose students to the developments and technological innovations in their chosen profession.

vi. To adequately prepare students for the working situations they are to meet after graduation.

vii. Exposure of students to inter-personal relationship skills they acquire in the professional world.

1.3 OBJECTIVES OF THE SIWES REPORT

i. To prove beyond all doubts that the students were actively involved in the industrial scheme.

ii. To provide a detailed account of the knowledge and experience gained by the students during the period of the internship.

iii. To provide a technical and detailed report on the activities engaged by the students during the period of the internship.

iv. To highlight the advantages, benefits and difficulties encountered by the students during the course of the internship.

v. To recommend feasible ways by which the problems encountered during the internship can be countered and solved.

1.4 ROLES OF STUDENT

i. Attend SIWES orientation program before going on attachment

ii. Comply with the establishment rules and regulations.

iii. Arrange accommodation during the period of attachment.

iv. Complete SPEI from ITF form and get it endorsed by the employer for submission to the ITF.

1.5 BODIES INVOLVED IN THE MANAGEMENT OF SIWES PRORAMME

The following bodies have specific roles assigned to them in the administration and management of SIWES.

- The Federal Government of Nigeria.
- The Industrial Training FUND (ITF)
- National Universities Commission (NUC)
- National Board for Technical Education (NBTE)
- National Commission for Colleges of Education (NCCE)
- The employers of labor.

1.5.1 THEIR ROLES

Federal Government of Nigeria

To provide adequate funds to the ITF through the Federal Ministry of Trade and Investment for the scheme.

The Industrial Training Fund (ITF)

i. Regularly organize orientation programs for students prior to their attachment.

ii. Ensure that employers training programs are relevant and effective.

iii. Establish and foster contacts between Universities, departments and industries at necessary levels of cooperation.

CHAPTER TWO

2.0 BRIEF HISTORY OF THE COMPANY

Chinese Construction Company was established in June 1979 under the approval of State Council of the People's Republic of China. Chinese Construction Company developed from the earlier Foreign Aid Department of the Ministry of Railways, building on its experience in executing the biggest foreign-aid project of China, the TAZARA Railway. It is now a large scale state-owned enterprise undertaking international project contracting and economic cooperation functions.

Its range of business extends from international contracting for railway construction to other forms of civil engineering design and consultancy, real estate development, trading industrial investment and hotel management. The business activities of CCECC have regions where more than 20 overseas offices or subsidiaries have been established. With its excellent performance and high quality performance and high quality services, CCECC has been listed among the world's top 255 international contractors for many years and ranked consecutively among the first 70 in recent years by the Engineering News Record "ENR"

Chinese Contractor Company began its operation in Kwara State Communities in 2020. Their aims to be a top brand in global investment and construction, contributing to China's reform, development and urbanization. They carry out housing construction, infrastructure construction and investment, real estate development and investment and survey and design.

2.1 COMPANY SERVICES

i. International project contracting particularly in civic engineering and infrastructure
ii. Civil engineering design and consultancy
iii. Real Estate Development, trading, industrial investment, and hotel management
iv. Railway operation, industrial park construction and development.

2.2 MISSION STATEMENT

Chinese Construction Company mission is to expand a happy living environment and create value for our customers. They focus on understanding customer demands and exceeding expectations by providing systematic solutions. They believe customer recognition and trust are crucial and strive to meet their needs.

2.3 VISION STATEMENT:

i. Chinese Construction Company vision is to become the investment and construction group with the most international competitiveness.

ii. They aim to achieve this by leveraging their competitive advantages in the investment and construction industry.

iii. They aspire to be respectable and publicly traded company with strong international competitiveness.

iv. They uphold their own advantages, carry on their glorious tradition and enhance competitiveness through continuous innovation and system marketing.

2.4 ORGANIZATIONAL STRUCTURE OF THE COMPANY

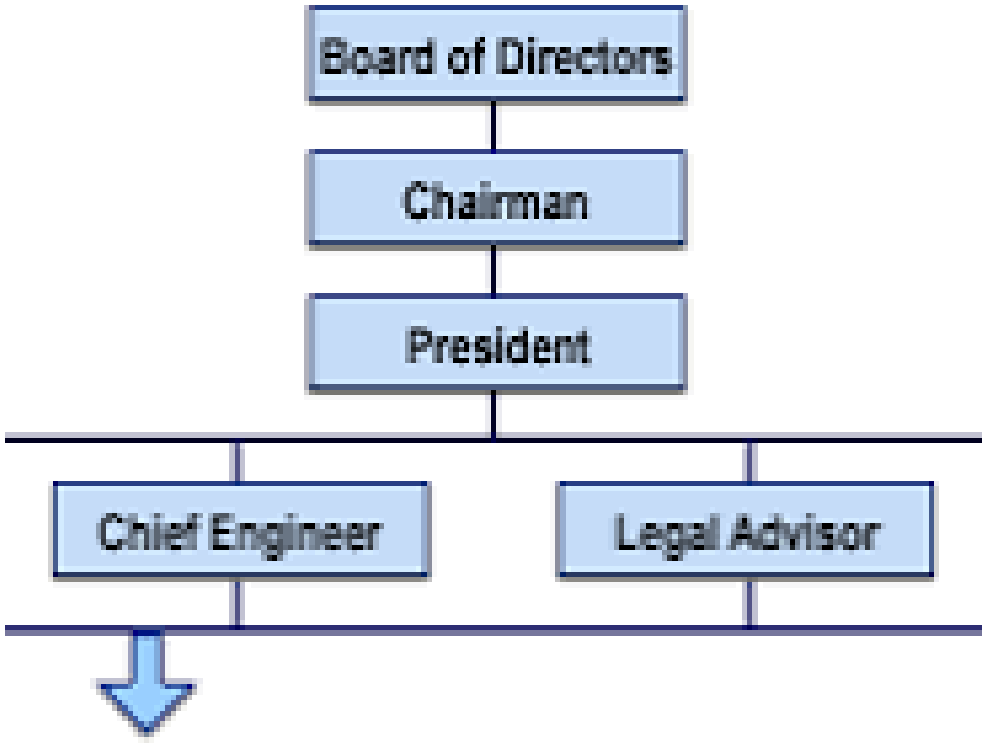


Fig.1. ***Organizational Structure Of The Company***

CHAPTER THREE

3.0 DESCRIPTION OF WORK DONE

In the course of my four months attachment at Chinese Contractor Company, I learnt about the quarry planning and management, Drilling and Blasting methods, crushing and screening operation. Although I was given an opportunity to work in each of the department for two months in order to have general knowledge of the work done in each of the department, a job duty in each of the department includes:

3.0.1 QUARRY PLANNING AND MANAGEMENT

Chinese Construction Company works with a diverse range of specialists extractive industry construction to provide a comprehensive suite of quarry development and project management services tailed to meet the specific needs of extractive industry projects.

Fig. 2Quarry Planning and Management

3.0.2 DRILLING AND BLASTING METHODS

Drilling and blasting is the controlled use of explosive and other methods, such as gas pressure blasting pyrotechnics, to break rock for excavation. I leant the component of a

drilling machine used for drilling the portion of a space where blasting operation will be carried out. Drill head frame sprindle bit check and motor houses the spindle bearings and drive mechanism.

Fig. 3. ***Drill and Blast Method***

I was introduce to the mechanism of spacing the drilled portion known as bonding, and how to calculate the depth through which the drill head has drill.

Learning the important of removing the unwanted materials covering the portion to be drill known as removal or over boarding.

A drilling operation was carried out to a depth of 25mm where high explosive that will be used for blasting operation will be placed.

Introduction to the mechanism of carrying out a blasting operation using high explosive e.g dynamite.

Learning about the essence of arranging the explosive properly in magazine.

And the safety precaution to be observed in each magazing and blasting mechanism is crucial for safe efficient operation.

Introduction to the mechanasim of connecting the electrical devices that enhance blasting operation such as detonating cord. Detonator and Non-electrical detonation, connecting wire.

A blasting operation was carried out so as to reduce the size of a rock to a manageable size.

Learning about the mechanism of using a jack hammer and a breaker to further reduce the size of the stone to a mere manageable size.

Introduction to the hydraulic breaker also know as hydraulic hammer is an essential tool in various industries.

And it expand quarry boundaries by breaking through hard rock formation.

Hydrautic breaker efficiently break rock into manageable size for crushing and processing.

3.0.3 CRUSHING AND SCREENING MACHINE

Crushing and screening process is a fundamental step in various industries, including mining, construction, recycling and aggregate production. It involve the breaking down of large materials into smaller, more manageable pieces and the separation of desired materials from unwanted ones.

Crusher can be used to reduce the size of raw materials such as rocks, ore and coal as well as recycled materials like concrete and asphalt. Screening on the other hand, involves separating materials into different size or grades based on their particle size.

Fig. 5 Crushing & Screening Operations

INTRODUCTION TO THE PRESSURE MACHINE

I was introduced to the Pressure machine also known as a hydraulic press or pressure to various materials. And I was told about its component also. Component is crucial for efficient operation. And it supplied compressed air to power the machine and hold the explosive.

Pressure machine aid material transport lifting and placement.

They explained the meaning of secondary crushing; secondary crushing was carried out immediately after planning crushing which makes it to be second stage of crushing.

Secondary crushing operation was carried out to further reduce the size of the sample that as already undergo primary crushing.

Component and arrangement of a core crusher that was used for secondary crushing was explain and the mechanism through which the conveyor belt transport a sample to various part of the crusher was explain as well.

INTRODUCTION TO SIZING AND CLASSIFICATION the material that is been crushed contain different grades and sizes and the mechanism through which the save shaker. Separates the different grades and sizes into different categories has being explain.

Identifying the different grade and sizes that being separate by give shakers is being explained which is further divided into:

¾ (19mm)

½ (13 mm)

3/8 (10 mm)

¼ (6 mm)

Dust (stone dust & pure dust)

Crushing and grinding are the two primary combination processes. Crushing is normally carried out on the "run-of-mine" ore. The grinding process which is normally carried out after crushing may be conducted on dry or slurred material. Minerals being crystals have a tendency to break into endless numbers of sizes and shapes every time they are introduced to energy. The difficulty in size reduction lays in the art of limiting the number of over and under sizes produced during the reduction. If this is not controlled, the mineral will follow its natural crystal behavior, normally ending up in over representation of fines.

Crushing is the largest process operation in minerals processing. The goal of this process is to produce rock or (more seldom) mineral fractions to be used as raw material for other industrial production. The quality parameters are normally strength, size and shape.

There are two kinds of equipment used for crushing works. One is by using crushers and other one is by using impactors. This diagram (fig. 6) illustrates the stages of size reduction from 1000mm to 4 mm. Crushing is the largest process operation in minerals processing. The goal is to produce rock or (more seldom) mineral fractions to be used as rock fill or ballast material for concrete and asphalt production. Quality parameters are normally strength, size and shape. The kinds of materials processed are Limestone, Granite, Gabbro, Basalt, River Stone, Coal Gangue, Quartz, Diabase, Iron Ore, Copper Ore, Zinc Ore and Manganese Ore. There are three stages in crushing as stage 1, 2 and 3.

In each stage the reduction in size ranges as referred to as R1, R2 and R3. This diagram illustrates the stages with equipments and reduction ratios. From 1000mm to 100-micron levels the mass is crushed.

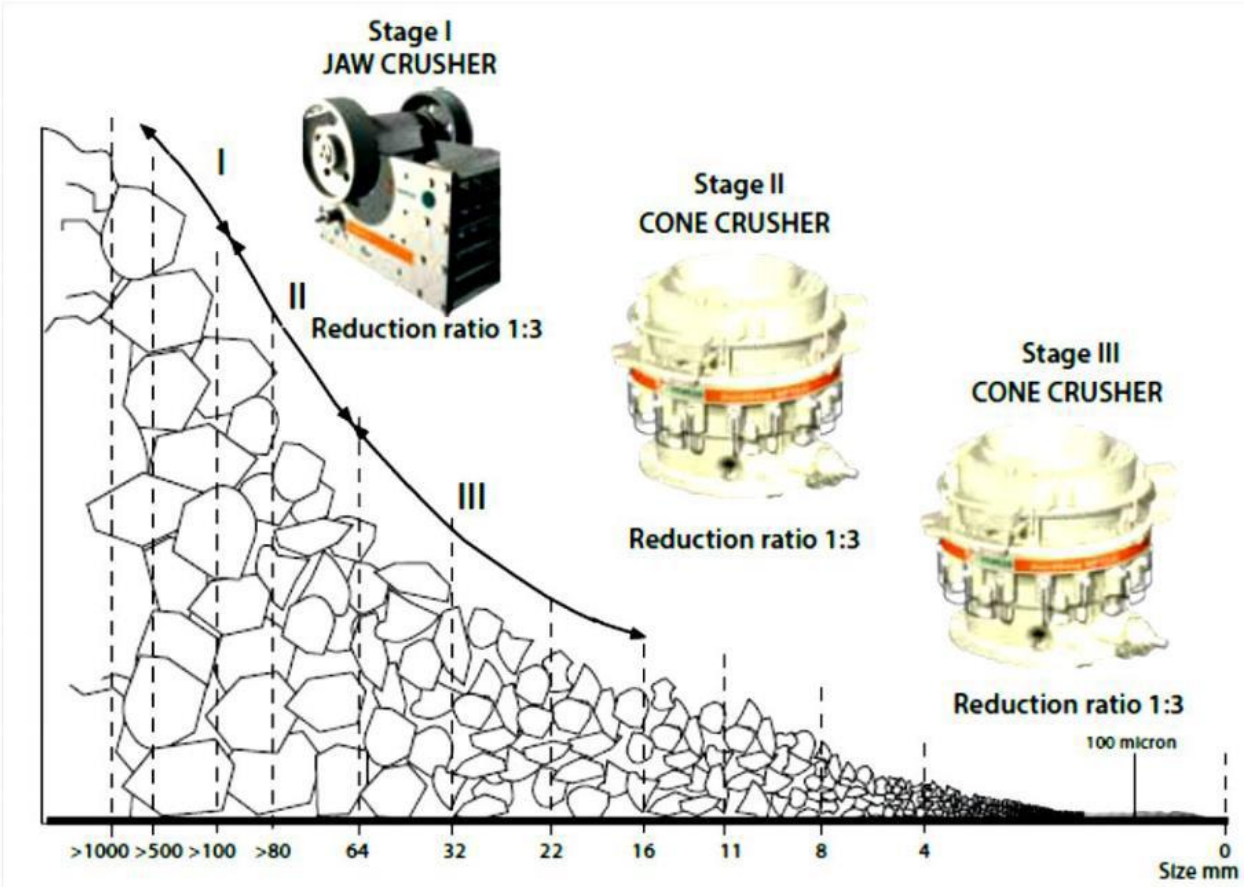


Fig. 6 different stages in crushing materials.

Types of Crushers:

Jaw crusher

A jaw crusher is generally used as a primary crusher in a crushing circuit. Product is fed into the top of the jaw crusher by a vibrating grizzly feeder. The eccentric rotating drive shaft causes the movable jaw to oscillate crushing the aggregate against a fixed jaw. Jaw crushers are run on belt drives driven by an electric motor or diesel engine. Jaw crushers are used extensively throughout the aggregate and mineral processing industry (fig. 12).

Fig. 7. Structure of a jaw crusher

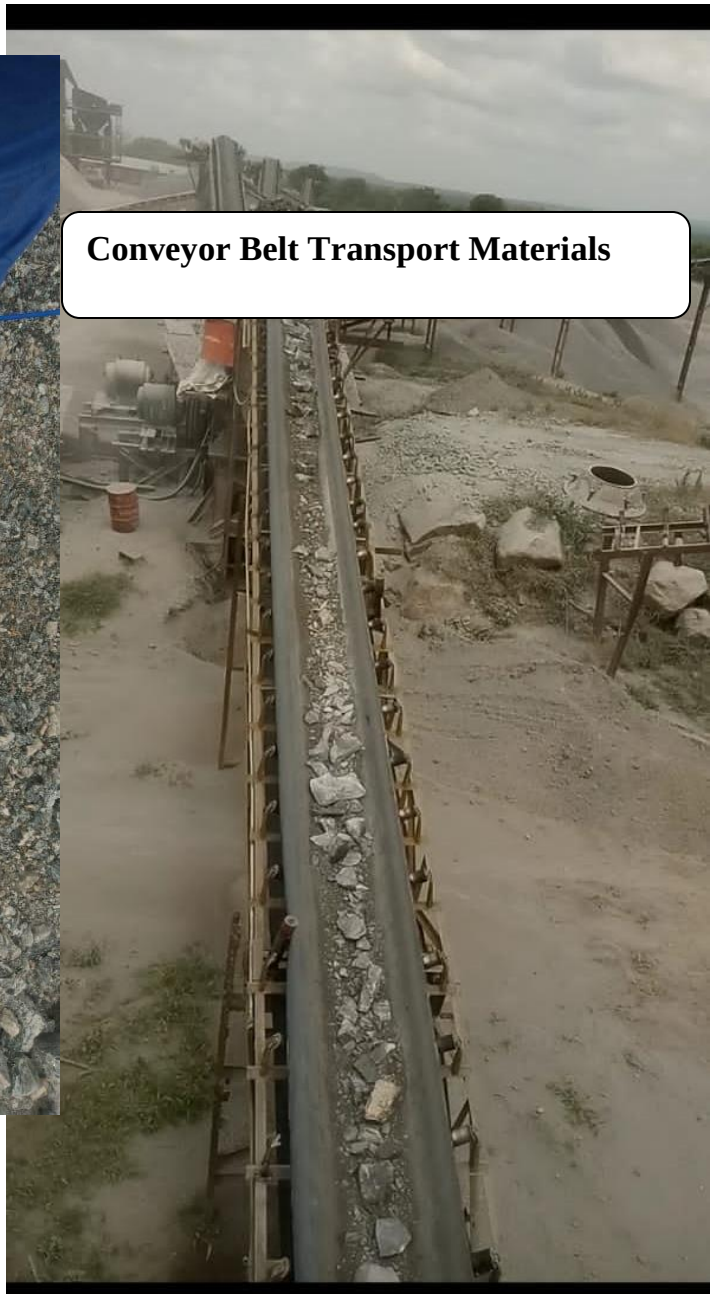
Gyratory crusher:

A gyratory crusher is similar in basic concept to a jaw crusher, consisting of a concave surface and a conical head; both surfaces are typically lined with manganese steel surfaces. The inner cone has a slight circular movement, but does not rotate; the movement is generated by an eccentric arrangement. As with the jaw crusher, material travels downward between the two surfaces being progressively crushed until it is small enough to fall out through the gap between the two surfaces. The gyratory crushers are robust crushers with modern features. They are designed to give optimal capacity in primary crushing, increasing the total capacity in the mining crushing process. These crushers have a large feed opening and a grooved mantle, making them suitable for crushing large boulders.

Below are the images take in the Construction Firm and the work done.

Connecting

Hole Drilling



Conveyor Belt Transport Materials

Drilling Method

Rock Breakers

CHAPTER FOUR

4.0 EXPERIENCES GATHERED FROM PROJECTS INVOLVED IN

Prior to my joining the company for my internship, I knew very little about quarry planning and had almost an insignificant knowledge to their economic importance or monetary values. My involvement in these projects mentioned earlier have however helped in broadening my scope of reasoning and exposed me to knowing of their significance. I also had the opportunity to know about port side dealings and how shipments move in and out of the country.

CHAPTER FIVE

5.1 RECOMMENDATION

The SIWES program is a wonderful one; it enables students gain experience as well as skills required in their fields of study. As one who has benefited from this scheme, I would like to make a few suggestions, to improve the quality of experience gained by students:

- Students should be sent specifically to establishments where the aims and objectives of SIWES would be achieved.
- The professional body (NIA) should provide some form of incentive for firms and organizations who take on students for Industrial Training attachment, as this would encourage firms to accept more students for their SIWES programme.
- The institution and ITF should assist students in getting placements thus enabling their SIWES program commence as planned.
- The school will also do well by incorporating these into the school curriculum since it is a major criterion for admission into construction or architectural firms. ii. Sending students specifically to establishments where the stipulated aims and objectives of SIWES would be achieved.
- The departments should help students secure placements on time and in reputable firms by providing them with the names of registered firms where they can be attached.
- Payment of befitting student‘s monthly allowance by ITF to assist in students‘ financial difficulties during the period of training especially in the area of transportation.
- Students should abide by the rules and regulations set by the company to foster a friendly relationship between them and the management of the company.
- The duration of the SIWES program should be extended to allow for room for more exposure of the students.

5.2 CONCLUSION.

In this Report I have attempted to give a overview of all the activities I carried out and the experience I gained during the four months industrial Training at the Chinese Construction Company. The knowledge I gained cannot be underestimated it greatly complimented all I leaned during my course of study so far in Kwara State Polytechnic.

I therefore conclude that, the SIWES programme a successful Minerals and Petroleum Resources at the same time, the experience gathered during the training will last for a life time.

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