TECHNICAL REPORT

ON

STUDENT INDUSTRIAL WORK EXPERIENCE SCHEME (S.I.W.E.S)

HELD AT

EYEVIEW INPECTION LIMITED

12/14 BABS Animashaun Street, Bode Thomas Surulere, Ojuelegba, Lagos State.

SUBMITTED BY

OLALERE OLAWALE SAMUEL

ND/23/MPE/FT/0001

SUBMITTED TO:

DEPARTMENT OF MINERAL AND PETROLEUM RESOURCES ENGINEERING
INSTITUTE OF TECHNOLOGY
KWARA STATE POLYTECHNIC, ILORIN, KWARA STATE.

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

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CERTIFICATION

This is to certify that the report was compiled by **OLALERE OLAWALE SAMUEL** with Matric Number **ND/23/MPE/FT/0001** a student of Mineral and Petroleum Resources Engineering Resources Department, Institute of Technology (IOT) Kwara State Polytechnic Ilorin, Kwara State on the completion of the Student Industrial Work Experience Scheme (SIWES)

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SIWES COORDINATOR **DATE**

_____ _____

HEAD OF DEPARTMENT **DATE**

DEDICATION

This report is dedicated to Almighty God, who guided me and made the programme a successful one for me.

It also goes to my loving Parent, in person of **Mr. and Mrs. Olalere** and to my wonderful mentors and friends, for their advice, encouragement and support both financially and morally. May God continue to bless you. (Amen)

ACKNOWLEDGEMENT

As such praise due to Almighty God for sparing my invincible life during my stay at Kwara State Polytechnic, Ilorin.

To the surprise of my one and only, my next point on call will definitely be my parent for their effort which upholds my success, in this regard, BIG THANKS to them **Mr. and Mrs. Olalere**, what will I? If not for their financial moral, spiritual and parental support, my success would have been delayed. I will say vividly "Oh God, have mercy on them even as they nourished me in my childhood.

My appreciation goes to my noble SIWES based supervisor, for their support and impartation of knowledge.

It is mandated on me that the effort of the following toward my success must duly be recognized from lecturers within the institution; May the blessing of God continue to shower you all for contributing immensely on this programme.

CHAPTER ONE

1.0 INTRODUCTION

This chapter gives a brief history of SIWES, its aims and objectives, as well as a short narrative on my application and posting. It also introduces intelligent solution providers (ISP) of Computer, where I had my SIWES training.

ABOUT STUDENTS INDUSTRIAL WORK EXPERIENCE SCHEME

The student work experience scheme (SIWES) is a worldwide program practiced in countries like Japan, Australia, USA, Europe, and in African countries too. It is popularly known as co-operative education and referred to as sandwich in Europe. It is a six (6) months students industrial work experience scheme (SIWES) taken in the third year of the degree program, where the students go to various establishments related to their course of study.

The program was initially introduced in Nigeria by the Industrial Training Fund (I.T.F.) which was established under Decree 47 of 1972 by the Supreme Military Council, headed by General Yakubu Gowon. The Decree was billed to take effect from 31st March, 1974 and had as its core objective, the gradual reduction of the percentage of foreign participation in most of Nigeria's economic activities, accompanied by a systematic cooperation of locally oriented skilled manpower into the vast economic sector.

One of the key functions of the ITF is to work as cooperative body with industry and commerce where students in institutions of higher learning can undertake mid-career work experience attachment in industries which are compatible with student's area of study. The students Industrial Work Experience Scheme (SIWES) is a skill Training program designed to expose and prepare students for the Industrial work situation which they are likely to meet after graduation. Participation in SIWES has become a necessary pre-condition for the award of diploma and degree certificate in specific disciplines in most institutions of higher learning in the country in accordance with the education policy of government.

BRIEF HISTORY OF SIWES

The word SIWES (Student Industrial Work Experience Scheme) was introduce by the federal government in the year 1973 to develop the technological, physical and social skill of our nation, through this, adequate and intelligent student are provide the department involved the actual challenge various discipline before they can be awarded as am National Diploma (ND) graduate.

AIMS AND OBJECTIVES OF SIWES

- Provide an avenue for students in institutions of higher learning to acquire industrial skills and experience in their approved course of study and also by interacting with people with more experience in the field under consideration.
- Prepare students for the industrial work situation which they are likely to meet after graduation.
- Expose students to work methods and techniques in handling equipment and machinery that are mostly not available in their various institutions.
- Provide students with an opportunity to apply their knowledge in real world situation thereby reducing the gap between theoretical knowledge and practical work.
- Enlist and strengthen employers' involvement in the entire educational process and prepare students for employment in Industry and Commerce.

ROLES OF STUDENT

- Attend SIWES orientation programme before going on attachment.
- Comply with the establishment's rule and regulation.
- Arrange living accommodation during the period of attachment.
- Record all training activity done and other assignment in the log book.
- Complete SPEI from ITF, FORM 8 and get it endorsed by the employer for submission to the ITF.

1.5 OBJECTIVES OF THE REPORT

The objectives of the SIWES report are;

- To make through explanation of the work done during my four month industrial training.
- To fulfill the requirement for national diploma in computer science.

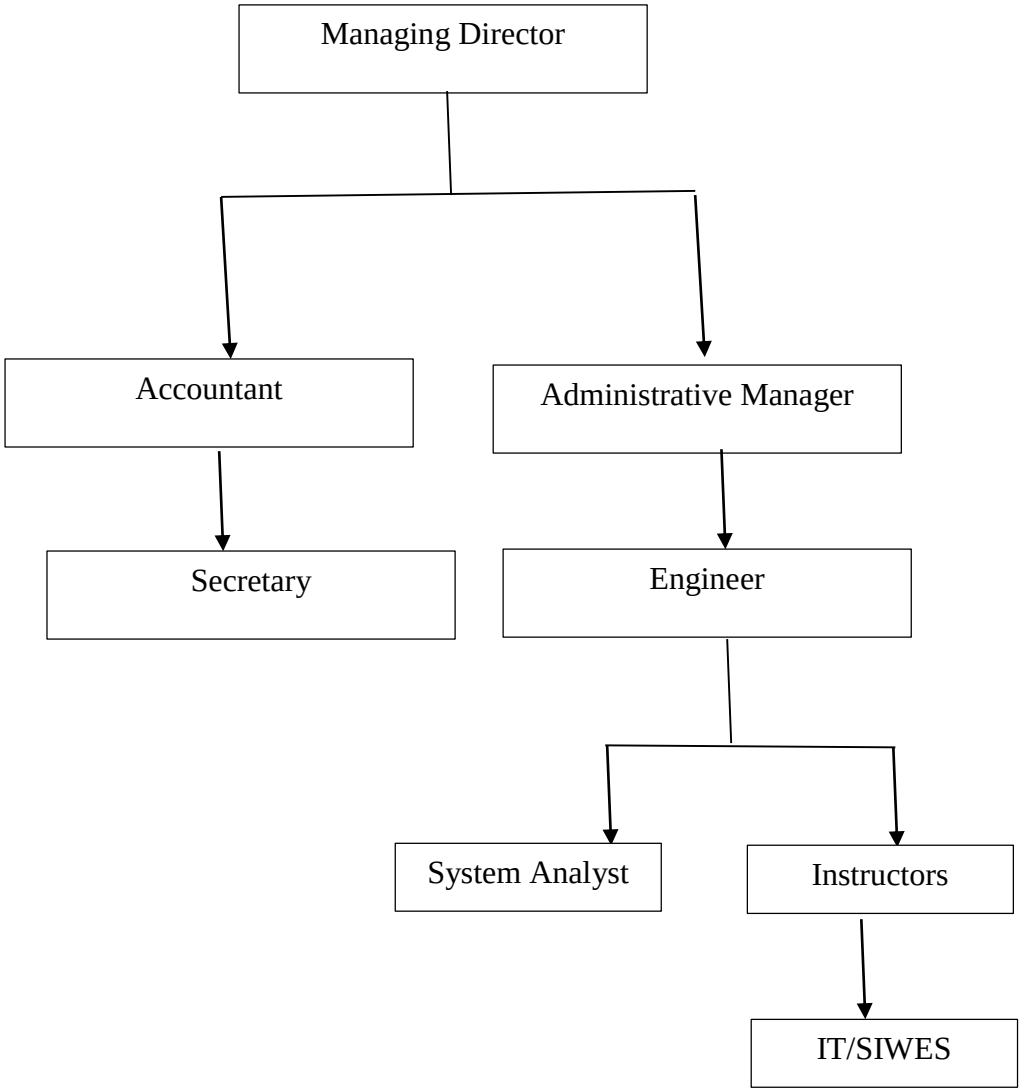
- To contribute to the body of knowledge and to enhance the understanding of the writer about a similar or same job.

THE LOGBOOK

The logbook issued to student on attachment by the institution was used to record all daily activities that took place during the period of attachment, and it was checked and endorse by the industry based/institution based supervisors and ITF during supervision.

CHAPTER TWO

2.0 ORGANIZATIONS CHART OF EYEVIEW INSPECTION LIMITED



2.1 BRIEF HISTORY OF EYEVIEW INSPECTION LIMITED

It is a non-governmental organization in Lagos State. They operate in Engineering Inspection situated at Lagos State

Engineering academic for training and skill acquisitions in nearly every aspect of Engineering of some of which include engineering section. Inspections, Mineral and Resources

This company is head by the director and administrative manager next to him followed by the engineers, system analyst and the instructors.

CHAPTER THREE

3.0 INTRODUCTION TO QUARRYING OPERATION

Quarrying operations involve the extraction of rocks, minerals, and other valuable geological materials from the earth's surface for construction, industrial, and manufacturing purposes. These operations are an essential part of the mining industry and provide raw materials such as limestone, granite, sand, and gravel, which are widely used in building infrastructure, road construction, and cement production. Quarrying is usually carried out in open pits, where materials are extracted through drilling, blasting, cutting, and hauling.

The process begins with site selection, considering factors such as the availability of high-quality materials, environmental impact, and proximity to markets. Once a suitable site is identified, excavation is carried out using specialized machinery such as excavators, loaders, and crushers to break down large rock formations into usable sizes. Blasting is often used to loosen hard rock, requiring careful planning to ensure safety and efficiency.

Despite its economic importance, quarrying has environmental and safety challenges, including dust emission, noise pollution, land degradation, and potential health hazards for workers. Therefore, strict regulations and modern technologies are employed to mitigate these effects while improving productivity. Overall, quarrying remains a vital industry that contributes significantly to construction and industrial development worldwide.

Site Selection in Quarrying Operations

Site selection is a critical step in quarrying operations as it determines the efficiency, profitability, and environmental impact of the extraction process. Choosing an appropriate location involves several factors, including geological, economic, environmental, and regulatory considerations.

The primary factor in site selection is the availability and quality of the material. Geologists conduct surveys and sampling tests to assess the composition, hardness,

and suitability of the rock or mineral for commercial use. The presence of high-quality limestone, granite, or other construction materials is essential for a productive quarry.

Economic factors also play a significant role. A quarry should be located near demand centers to minimize transportation costs and ensure a steady supply of materials for construction and industrial use. Proximity to major roads, ports, and distribution networks helps reduce logistical expenses and increases market accessibility.

Environmental and social factors are equally important. Quarrying can impact ecosystems, water sources, and air quality, so it is crucial to consider these aspects to avoid legal and community opposition. Environmental Impact Assessments (EIA) are conducted to evaluate potential consequences and implement mitigation measures such as dust suppression, noise control, and land rehabilitation.

Additionally, regulatory approvals from government authorities must be obtained before commencing quarrying activities. This includes land permits, mining licenses, and adherence to safety and environmental laws. A well-selected site ensures sustainable extraction while minimizing costs, operational difficulties, and environmental damage.

Extraction Techniques in Quarrying Operations

Extraction techniques in quarrying operations vary based on the type of material being quarried, the geological formation, and the intended use of the extracted material. The primary goal of extraction is to remove rock or minerals efficiently while ensuring safety, minimizing waste, and reducing environmental impact. The major extraction methods used in quarrying include **drilling and blasting, mechanical excavation, and cutting techniques.**

1. Drilling and Blasting

This is the most common method used for extracting hard rock such as granite, limestone, and marble. It involves drilling holes into the rock and placing explosives to break the material into smaller fragments. The process must be carefully planned

to control the size of the blast, reduce vibrations, and ensure safety. After blasting, the loosened materials are collected using excavators and transported for further processing.

2. Mechanical Excavation

For softer materials like sand, gravel, and clay, mechanical excavation is preferred. This method uses heavy machinery such as bulldozers, excavators, and draglines to remove material without the need for explosives. Mechanical excavation is efficient and reduces the risks associated with blasting.

3. Cutting Techniques

In quarries where high-value materials like marble and granite are extracted, wire saws, chain saws, and diamond-tipped cutting tools are used. These techniques allow precise cutting, minimizing waste and preserving the natural beauty of the stone. Water jet cutting is another modern method that uses high-pressure water mixed with abrasives to cut through rock with minimal environmental impact.

Each extraction technique is chosen based on the material type, quarry size, and operational efficiency. Proper planning and technology integration ensure sustainable and cost-effective quarrying operations.

OPEN-PIT MINING

Open-pit mining is a surface mining technique used to extract minerals, ores, and rocks from large, open excavations. It is one of the most common methods for mining materials such as limestone, granite, iron ore, gold, and copper. This method is preferred when the mineral deposits are located near the surface and spread over a large area, making underground mining impractical.

The process of open-pit mining begins with site preparation, which includes land clearing, environmental assessments, and infrastructure development. Once the site is ready, overburden (the layer of soil and rock covering the valuable material) is removed using heavy machinery such as bulldozers, draglines, and haul trucks. This

exposes the ore or mineral deposits, which are then extracted using drilling, blasting, or mechanical excavation techniques.

Blasting is often used to break hard rock formations into smaller, manageable pieces. After blasting, large excavators and loaders transport the material to crushers or processing plants, where the minerals are refined. The mining operation follows a stepwise approach, creating benches or terraces to ensure safety and efficient material extraction. These benches provide access to deeper sections of the pit and help stabilize the excavation walls.

Despite its economic benefits, open-pit mining has environmental challenges, including habitat destruction, dust pollution, and groundwater contamination. To mitigate these effects, modern mining operations implement land reclamation strategies, dust suppression techniques, and water management systems.

Open-pit mining remains a cost-effective and efficient method for large-scale mineral extraction, supporting industries such as construction, manufacturing, and energy production.

Design and Planning in Open-Pit Mining

The success of an open-pit mining operation largely depends on effective design and planning, which ensures safety, efficiency, and environmental sustainability. The design and planning phase involves several key considerations, including geological assessment, pit layout, slope stability, haul road design, waste management, and environmental impact mitigation.

1. Geological Assessment

Before mining begins, detailed geological surveys and core drilling are conducted to determine the composition, quality, and depth of the ore body. This data helps in estimating the mine's lifespan, determining the best extraction methods, and assessing economic feasibility.

2. Pit Layout Design

The shape and depth of an open pit are designed based on the distribution of mineral deposits. The pit is typically developed in a series of stepped levels known as **benches**, which provide access to deeper ore and enhance stability. Bench height, width, and angle are carefully calculated to ensure safe mining operations.

3. Slope Stability

Steep pit walls can lead to landslides and collapse, posing risks to workers and equipment. Engineers analyze rock strength, groundwater conditions, and geological faults to design stable slopes. In some cases, reinforcement methods like rock bolting and drainage systems are implemented to prevent slope failures.

4. Haul Road Design

Efficient transportation of extracted materials is crucial for productivity. Haul roads within the pit are designed to accommodate large trucks and machinery, ensuring smooth traffic flow. Roads are built with proper gradients and turning angles to minimize fuel consumption, vehicle wear, and accident risks.

5. Waste Management and Overburden Handling

In open-pit mining, large amounts of waste rock and overburden must be removed before reaching the valuable ore. A well-planned waste disposal system is essential to minimize environmental impact. Overburden is often stored in designated dump sites or used for land rehabilitation after mining operations.

6. Environmental and Safety Considerations

Open-pit mining can have significant environmental impacts, including deforestation, dust pollution, and water contamination. To address these concerns, modern mines incorporate dust control measures, water recycling systems, and reforestation programs. Additionally, strict safety protocols, such as controlled blasting and worker training, are implemented to prevent accidents.

Proper design and planning in open-pit mining optimize resource extraction, reduce costs, and ensure sustainability. Advances in technology, such as 3D mine modeling and automation, continue to improve mining efficiency while minimizing environmental and safety risks.

Safety Measures in Open-Pit Mining

Safety is a critical aspect of open-pit mining due to the high risks associated with large-scale excavation, heavy machinery operation, and blasting activities. Implementing strict safety measures ensures the protection of workers, equipment, and the environment. These measures include slope stability management, controlled blasting techniques, dust and noise control, equipment safety protocols, emergency response planning, and worker training.

1. Slope Stability Management

Unstable pit walls can lead to landslides and rockfalls, endangering workers and equipment. Engineers conduct **geotechnical studies** to determine the safest bench angles and pit slope designs. Reinforcement techniques, such as rock bolting, wire mesh, and drainage systems, are used to enhance slope stability and prevent collapses.

2. Controlled Blasting Techniques

Blasting is a necessary part of open-pit mining, but if not properly managed, it can cause ground vibrations, fly rock, and air pollution. Controlled blasting techniques, including **precise drilling patterns and delay detonation systems**, help minimize excessive rock displacement and reduce environmental impact. Workers must maintain a safe distance from the blasting site, and warning signals must be used before detonation.

3. Dust and Noise Control

Mining activities generate significant dust and noise, which can lead to respiratory diseases and hearing problems among workers. To mitigate these hazards, mines use

water spraying systems, dust suppressants, and proper ventilation to reduce airborne particles. Workers are also provided with **protective equipment such as dust masks and earplugs** to minimize health risks.

4. Equipment Safety Protocols

Heavy machines such as excavators, haul trucks, and drilling rigs are essential in open-pit mining but pose serious safety risks. Regular **maintenance and inspections** are carried out to ensure machines are in proper working condition. Operators must be trained to follow **safe operating procedures**, including wearing seatbelts, using backup alarms, and maintaining a safe distance from other equipment.

5. Emergency Response and Risk Management
Every mining operation must have an **emergency response plan** to handle accidents such as landslides, equipment failures, and fire outbreaks. Emergency evacuation routes, fire suppression systems, and first aid stations are strategically placed within the mining area. Regular **safety drills** are conducted to prepare workers for potential emergencies.

6. Worker Training and Personal Protective Equipment (PPE)
Proper training is essential for ensuring worker safety in open-pit mining. All personnel undergo **comprehensive training programs** covering hazard awareness, machine operation, emergency response, and first aid. Workers are also required to wear appropriate **PPE, including helmets, safety boots, reflective vests, gloves, and protective eyewear**, to minimize injury risks.

By enforcing strict safety regulations and continuously improving safety practices, open-pit mining operations can reduce accidents, protect workers, and ensure efficient and sustainable mineral extraction.

HEAVY MACHINERY IN MINING

Heavy machinery plays a crucial role in open-pit mining by enabling efficient extraction, transportation, and processing of minerals. These machines are designed

to handle large volumes of earth and rock, improving productivity while ensuring safety and reducing manual labor. The selection of machinery depends on factors such as the type of deposit, mining depth, and operational scale.

1. Types of Heavy Machinery Used in Mining

(a) Excavators and Shovels

- Excavators and hydraulic shovels are used for digging, material handling, and loading haul trucks.
- They come in different sizes, from small units for precise excavation to massive shovels capable of moving thousands of tons of material per hour.
- Some common types include **dragline excavators**, which use a bucket attached to a long boom to remove overburden in large pits.

(b) Haul Trucks

- Haul trucks are massive dump trucks designed to transport mined material from the pit to processing plants or waste dumps.
- Modern haul trucks can carry loads of over **400 tons** and are equipped with GPS tracking, fuel efficiency systems, and autonomous driving technology to improve productivity.

(c) Drilling Rigs

- Drilling rigs are used to bore holes for explosives in blasting operations.
- These rigs vary from small, mobile units to large, automated drill systems that enhance accuracy and reduce fuel consumption.

(d) Bulldozers

- Bulldozers are used for earthmoving, road construction, and clearing overburden.
- They are equipped with powerful blades to push large quantities of soil, rocks, or debris, making them essential for site preparation and land reclamation.

(e) Loaders

- Wheel loaders and front-end loaders are used to scoop and transfer materials onto haul trucks.
- These machines are essential for stockpile management, loading operations, and transporting ore within the mining site.

(f) Crushers and Conveyors

- Crushers break down large rocks into smaller, more manageable pieces before further processing.
- Conveyors transport materials efficiently across long distances, reducing the need for heavy truck traffic and lowering operational costs.

2. Automation and Technological Advancements

- Modern mines increasingly use **autonomous trucks and drilling rigs** to improve efficiency and safety.
- **Remote monitoring systems** allow operators to track machine performance, detect faults, and optimize fuel consumption.
- **Electric-powered heavy machinery** is being introduced to reduce emissions and comply with environmental regulations.

3. Maintenance and Safety of Heavy Machinery

- Regular **preventive maintenance** ensures that mining equipment operates efficiently, minimizing breakdowns and costly downtime.
- **Safety features**, such as collision avoidance systems, fire suppression units, and operator training programs, help reduce accidents and improve working conditions.

Heavy machinery is the backbone of mining operations, increasing productivity and reducing human effort. As technology advances, mining equipment is becoming more efficient, autonomous, and environmentally friendly, transforming the industry for the future.

CHAPTER FOUR

4.0 KNOWLEDGE GAINED DURING THE SIWES

The student industrial work experience scheme (siwes) exercise has contributed greatly in my academic carrier, because I have gained some experience which is very useful to my field of study. The advantage I acquire during my industrial training programme was that i was taught Quarry, Open Pit, Blasting and Heavy Machine

Finally, my perception about engineering profession has been greatly widely broaden. It gives me the opportunity to gain first experience of the profession even though it was not easy.

CHAPTER FIVE

5.0 CONCLUSION

The SIWES program expected to be undergone by all students in the school of applied science in all tertiary institution in Nigeria.

I therefore deeply appreciate the industrial training of my school (Kwara State Polytechnic, Ilorin) for involving themselves in such a worldwide program. The importance of this training cannot be over emphasized industrial training by some operations carried out during the program.

5.1 RECOMMENDATION

I like to use this medium to explore the federal Government at all stage to take this SIWES program more seriously seen by the students of applied science as a virtual improvement in future of technology in our nature.

Government should also ensure a proper supervision of SIWES student so that the purpose of the programme will be achieved.

The federal Government should make adequate provision in the annual budget for proper funding of SIWES in view of the potential of the scheme to contribute to enhancing the quality of the pool to technical skill available to the economy.

A comprehensive and detail directory of employer who accept students for SIWES is urgently required to facilitate placement of student in industry.

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