



**TECHNICAL REPORT  
ON  
STUDENTS' INDUSTRIAL WORK EXPERIENCE  
SCHEME (SIWES)**

**HELD AT  
MATHBORAH ENGINEERING SERVICES LTD**

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ND/23/BLD/FT/0018**

**SUBMITTED TO  
THE DEPARTMENT OF BUILDING TECHNOLOGY,  
INSTITUTE OF ENVIRONMENTAL STUDIES  
KWARA STATE POLYTECHNIC, ILORIN  
IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR  
THE AWARD OF NATIONAL DIPLOMA IN BUILDING  
TECHNOLOGY**

**AUGUST – NOVEMBER, 2024**

## **DEDICATION**

This report is dedicated to the Almighty God, the giver and sustainer of life, for His unconditional love and mercy granted to me throughout the period of my Industrial Training.

## **ACKNOWLEDGEMENTS**

I give thanks to Almighty God, who gave me the gift of life, and made everything possible.

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## **TABLE OF CONTENTS**

Title page

Certification

Dedication

Acknowledgements

### **CHAPTER ONE**

1.0 About the Industrial Training Fund (I.T.F)

1.1 About SIWES

1.2 Scope

1.3 Aim and objective of S.I.W.E.S

### **CHAPTER TWO**

#### **DESCRIPTION OF THE ORGANIZATION**

2.1 Background of Mathborah Engineering Services Ltd

2.2 Organizational Structure

2.3 Scope of Work

### **CHAPTER THREE**

#### **WORK DONE**

3.1 Formwork for Staircase, Soak-away, and Septic Tank

3.2 Reinforcement and Casting for Soak-away and Septic Tank

3.3 Arrangement of Reinforcement for the First-Floor Slab

3.4 Other Relevant Tasks

### **CHAPTER FOUR**

#### **CHALLENGES AND LESSONS LEARNED**

4.1 Challenges Encountered

4.2 Solutions Adopted

4.3 Skills Gained

### **CHAPTER FIVE**

#### **CONCLUSION AND RECOMMENDATIONS**

5.1 Summary of Experience

5.2 Recommendations for Improving SIWES

## **CHAPTER ONE**

### **1.0 About the Industrial Training Fund (I.T.F)**

In October 1971, the federal government established the Industrial Training Fund (I.T.F). In its policy statement no.1 published in 1973, a clause was inserted dealing with the issue of practical skills among the locally trained professionals in the tertiary institutions especially the Universities of Technology, Monotechnics, Polytechnics, Colleges of Education and Technical Colleges. Section 15 of the policy statement states clearly that “Great emphasis will be placed on assisting certain products of the post-secondary school system to adapt or orientate easily to their possible post graduation job environments”, subsequently leading to the launch of a scheme know as the Student’s Industrial work Experience Scheme(SIWES).

The Students Industrial Work Experience Scheme (SIWES) is a skill acquisition and training program designed to expose students in higher institutions to the industrial work environment. Established by the Industrial Training Fund (ITF) in 1973, the program bridges the gap between theoretical knowledge acquired in the classroom and practical application in the industry. It is a mandatory requirement for students in science, engineering, technology, and related disciplines to gain hands-on experience in their respective fields.

The program typically spans 3 to 6 months, during which students are attached to reputable organizations in their area of study. It provides opportunities for students to understand real-world applications of their coursework and develop essential technical skills required for professional practice.

### **1.1 About SIWES**

The S.I.W.E.S. was launched in 1973 by the Industrial Training Fund (I.T.F) as a programme designed to impart the undergraduate of the nation’s tertiary institutions studying various professional courses with the practical methods of performing professional functions to real life situations on site, in

the office or even the factory and how they apply themselves mentally, intellectually and physically in relation to what they have been taught in the classrooms theoretically. It works with the following professional bodies to function effectively across the tertiary institutions nationwide. These are the Nigeria University Commission (N.U.C), National Board for Technical Education (N.B.T.E.) and the National Commission for Colleges of Education (N.C.C.E.). Thus, equipping the students with the necessary skills and technical knowledge to make them highly competitive and professional individuals in the Labour Market

## **1.2 Scope**

The scheme as conducted by the Industrial Training Fund (I.T.F) through their representative liaison units and offices situated within the various institution and in major cities or towns in Nigeria with the necessary industrial rudiments needed to corroborate, practicalize and then actualize the required technical knowledge. The Industrial Training experience not only puts them in real life situations but also exposes their practical knowledge of the course of study, consequently perfecting this knowledge thereby producing very competent and versatile professionals.

## **1.3 Aim and objective of S.I.W.E.S**

The objectives of SIWES are as follows:

1. To expose students to practical and industrial environments, enabling them to gain hands-on experience in their field of study.
2. To complement the theoretical knowledge acquired in classrooms with practical skills.
3. To equip students with professional skills and ethical values necessary for successful integration into the workforce.
4. To familiarize students with modern laboratory equipment, techniques, and safety protocols.

5. To provide an opportunity for students to network and build relationships with industry professionals.
6. To encourage problem-solving and innovative thinking by engaging students in real-world challenges.

## **CHAPTER TWO**

### **DESCRIPTION OF THE ORGANIZATION**

#### **2.1 Background of Mathborah Engineering Services Ltd**

Mathborah Engineering Services Ltd is a reputable **construction and engineering firm** that specializes in **building construction, civil works, structural engineering, and project management**. The company was established with the vision of providing **high-quality, durable, and cost-effective construction solutions** in both residential and commercial projects.

Since its establishment, Mathborah Engineering Services Ltd has been involved in numerous **building and civil engineering projects** across Nigeria. The company is known for its expertise in **reinforced concrete structures, formwork construction, foundation works, and finishing services**.

The firm operates with a team of **highly skilled engineers, builders, architects, and technicians** who collaborate to deliver **structurally sound and aesthetically appealing buildings**. It is also committed to **safety, innovation, and sustainable construction practices** in all its projects.

#### **Company's Vision and Mission**

- **Vision:** To be a leading construction company recognized for quality, innovation, and excellence in the industry.
- **Mission:** To deliver high-standard construction projects using the best engineering practices and modern technology while maintaining safety and sustainability.



## 2.2 Organizational Structure

Mathborah Engineering Services Ltd operates with a **well-defined organizational structure** that ensures **efficient workflow, coordination, and project execution**. The company's hierarchy is as follows:



## 2.3 Scope of Work

Mathborah Engineering Services Ltd is actively involved in a wide range of **construction and engineering services**, which include but are not limited to:

### A. Building Construction

- Residential buildings (bungalows, duplexes, and apartments).
- Commercial buildings (offices, shopping complexes, warehouses).
- Institutional buildings (schools, hospitals, and churches).

## **B. Civil and Structural Engineering**

- Foundation construction (raft, pad, strip, and pile foundations).
- Reinforced concrete works (beams, columns, slabs, and staircases).
- Retaining walls, culverts, and drainage systems.

## **C. Formwork and Reinforcement Works**

- **Timber and plywood formwork** for beams, columns, staircases, and slabs.
- **Steel reinforcement fabrication** for foundations, slabs, and bridges.
- **Concrete casting and curing techniques** to achieve maximum strength.

## **D. Road and Infrastructure Development**

- Road construction and rehabilitation.
- Drainage system design and construction.
- Paving and landscaping works.

## **E. Finishing Works**

- Plastering, tiling, painting, and roofing.
- Installation of doors, windows, and ceilings.
- Plumbing and electrical fittings.

## **F. Project Management and Consultancy**

- Feasibility studies and site analysis.
- Cost estimation and budgeting.
- Quality control and safety management.

Mathborah Engineering Services Ltd ensures that all projects comply with **standard building regulations and codes** while integrating **modern construction techniques** for durability and sustainability.

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## **CHAPTER THREE**

### **WORK DONE**

This chapter details the practical activities I participated in during my SIWES at **Mathborah Engineering Services Ltd.** Each task was carried out in stages to ensure proper execution according to construction standards.

#### **3.1 Formwork for Staircase, Soak-away, and Septic Tank**

**Formwork** is the temporary or permanent molds into which concrete is poured. During my training, I was involved in constructing formwork for staircases, soak-away pits, and septic tanks.

##### **3.1.1 Process and Stages of Formwork Construction**

###### **A. Formwork for Staircase**

###### **1. Site Inspection and Measurement:**

- Assessed the site and collected necessary dimensions.

###### **2. Preparation of Materials:**

- Cut timber to size for risers, treads, and side supports.

###### **3. Erection of Stringers and Risers:**

- Installed side supports (stringers) and nailed the risers in place.

###### **4. Fixing Plywood for Shuttering:**

- Attached plywood to hold the shape of the steps.

###### **5. Application of Form Oil:**

- Used a release agent to prevent concrete from sticking.

###### **B. Formwork for Soak-away and Septic Tank**

###### **1. Excavation of the Pit**

- Marked the area and excavated to the required depth.

###### **2. Installation of Formwork Panels**

- Set up timber panels around the perimeter.

###### **3. Bracing and Support:**

- Used planks and nails to strengthen the formwork.

###### **4. Checking for Level and Alignment:**

- Ensured accuracy before proceeding to reinforcement.

### **3.2 Reinforcement and Casting for Soak-away and Septic Tank**

**Reinforcement** is essential to enhance concrete strength and durability. I assisted in cutting, bending, and tying reinforcement bars.

#### **3.2.1 Stages in Reinforcement Work**

##### **1. Bar Bending and Cutting:**

- Cut iron rods to size using a steel cutter.

##### **2. Tying Reinforcement Mesh:**

- Used binding wire to tie rods at intersections.

##### **3. Placement Inside the Formwork:**

- Ensured proper positioning with spacers.

#### **3.2.2 Casting Process**

##### **1. Mixing Concrete (1:2:4 Ratio – Cement, Sand, Gravel):**

- Mixed manually using shovels or with a concrete mixer.

##### **2. Pouring and Compacting:**

- Filled the formwork and compacted with a vibrator to remove air voids.

##### **3. Curing:**

- Sprinkled water over the concrete to prevent cracking.

### **3.3 Arrangement of Reinforcement for the First-Floor Slab**

This involved the installation of steel bars before casting the first-floor slab.

#### **3.3.1 Process of Reinforcement Arrangement**

##### **1. Laying of Bottom Mesh:**

- Positioned Y12 and Y16 bars at calculated intervals.

##### **2. Placement of Spacers:**

- Maintained a gap between steel and formwork for proper concrete cover.

##### **3. Fixing of Top Mesh:**

- Placed additional steel bars as per the structural drawing.

#### **4. Double Checking for Accuracy:**

- Verified alignment before proceeding to concrete pouring.

### **3.4 Other Relevant Tasks**

- **Cutting and Smoothing of Wood:** Prepared timber for shuttering and formwork.
- **Nailing and Assembling Wooden Components:** Constructed supporting frames.
- **Re-smoothing and Polishing Wood:** Ensured a fine finish on wooden materials.

## **CHAPTER FOUR**

### **CHALLENGES AND LESSONS LEARNED**

#### **4.1 Challenges Encountered**

**1. Harsh Weather Conditions:**

- Exposure to intense sunlight and rain affected work progress.

**2. Heavy Manual Work:**

- Lifting materials such as cement bags and reinforcement bars was strenuous.

**3. Inaccurate Site Measurements:**

- Occasional errors in dimensions required corrections.

**4. Delays in Material Supply:**

- Waiting for cement, reinforcement bars, and timber sometimes delayed work.

**5. Formwork Failure:**

- Some formworks collapsed due to inadequate bracing.

#### **4.2 Solutions Adopted**

**1. Use of Protective Gear:**

- Wore gloves, helmets, and boots for safety.

**2. Teamwork and Task Delegation:**

- Shared heavy work among multiple workers.

**3. Double Checking Measurements:**

- Ensured accuracy by using measuring tapes and levels.

**4. Effective Communication with Suppliers:**

- Ordered materials ahead of time to prevent delays.

**5. Reinforcement of Formwork Supports:**

- Added extra bracing to prevent failure.

### **4.3 Skills Gained**

- 1. Practical Knowledge of Formwork Construction**
- 2. Ability to Cut and Bend Reinforcement Bars**
- 3. Concrete Mixing and Pouring Techniques**
- 4. Teamwork and Communication Skills**
- 5. Problem-Solving Skills on a Construction Site**

## CHAPTER FIVE

### CONCLUSION AND RECOMMENDATIONS

#### 5.1 Summary of Experience

My **Students Industrial Work Experience Scheme (SIWES)** at **Mathborah Engineering Services Ltd** was an invaluable opportunity to bridge the gap between theoretical knowledge and practical application in the field of **Building Technology**. Throughout my training, I was actively involved in various construction activities, including **formwork construction, reinforcement work, concrete casting, and site supervision**.

One of the key experiences during my SIWES was the **construction of formwork for staircases, soak-away pits, and septic tanks**. This task required precision in measurement, proper wood cutting, and assembly techniques to ensure structural stability. I learned how to **properly brace and support formwork** to prevent collapse during concrete pouring.

Another significant aspect of my training was **reinforcement work**, where I was responsible for cutting, bending, and tying reinforcement bars. I gained hands-on experience in **understanding structural load distribution, reinforcement spacing, and proper binding techniques** to ensure strong and durable concrete structures.

Furthermore, I participated in **concrete mixing and casting** for various structural elements, including **soak-away pits, septic tanks, and the first-floor slab of a two-bedroom duplex**. This task required knowledge of **proper concrete mix ratios (cement, sand, and gravel), compaction techniques, and curing processes** to achieve the desired strength and durability.

Beyond technical skills, I developed **essential soft skills** such as:

- **Time management** – ensuring work was completed within deadlines.
- **Teamwork and collaboration** – working effectively with site supervisors, engineers, and laborers.



- **Problem-solving skills** – troubleshooting issues like inaccurate measurements, material shortages, and site constraints.
- **Site safety awareness** – adhering to construction safety protocols to minimize workplace hazards.

Additionally, I had the opportunity to observe **construction management practices**, including **project planning, site coordination, material procurement, and supervision**. This exposure helped me understand the importance of effective project management in delivering high-quality construction projects within budget and time constraints.

Overall, my SIWES experience was highly **educational and transformative**, equipping me with **practical construction skills, technical knowledge, and industry exposure** that will be invaluable in my future career as a **Building Technologist**. It also reinforced the importance of **continuous learning and adaptability** in the ever-evolving construction industry.

## 5.2 Recommendations for Improving SIWES

1. **Provision of Protective Equipment by Companies**
  - Ensure all trainees receive safety gear.
2. **Inclusion of More Practical Sessions in School**
  - Schools should introduce **pre-SIWES training** to prepare students.
3. **Timely Payment of SIWES Allowances**
  - Government and schools should ensure students receive stipends for transport and feeding.
4. **Use of Modern Construction Tools**
  - Companies should provide **mixers, vibrators, and cutting machines** to reduce manual labor.
5. **Better Coordination Between Schools and Companies**
  - Regular monitoring of students during SIWES for better learning outcomes.