



**STUDENT INDUSTRIAL WORK EXPERIENCE SCHEME
(SIWES)
HELD AT**

**YEMI ETADNAM ENTERPRISES LIMITED
PELLER ROAD, OPPOSITE S.B. HAMMED STREET, ISEYIN, OYO STATE, NIGERIA**

BY

**OGUNSOLA, Quadri Olamilekan
ND/23/EEE/FT/0027**

**DEPARTMENT OF ELECTRICAL/ELECTRONICS ENGINEERING
INSTITUTE OF TECHNOLOGY (I.O.T)
KWARA STATE POLYTECHNIC ILORIN;
P.M.B 1375, ILORIN**

***IN PARTIAL FULFILLMENT OF THE REQUIREMENT
FOR THE AWARD IN NATIONAL DIPLOMA
CERTIFICATE IN ELECTRICAL/ELECTRONICS ENGINEERING***

AUGUST – NOVEMBER, 2024

REPORT OVERVIEW

This report presents an exhaustive account of my Student Industrial Work Experience Scheme (SIWES) conducted at Yemi Etadnam Enterprises Limited, located at Peller Road, Opposite S.B. Hammed Street, Iseyin, Oyo State, from August to November 2024. It meticulously details the training objectives, extensive electrical tasks performed, technical skills mastered, challenges navigated, and recommendations proposed for improvement. The training was predominantly centered on electrical engineering practices, including intricate residential wiring, installation of electrical fittings, and advanced troubleshooting of power systems. This experience served as a robust platform to translate theoretical concepts from my academic studies at Kwara State Polytechnic, Ilorin, into practical expertise, preparing me comprehensively for a career in electrical engineering.

TABLE OF CONTENTS

- **INTRODUCTION**

- 1.1 Background

1.2 Objectives

- **DESCRIPTION OF THE ESTABLISHMENT**

- 2.1 Location and Brief History
- 2.2 Objectives of the Establishment
- 2.3 Organization Structure

- **WORK EXPERIENCE AND ACTIVITIES**

- 3.1 Detailed Description of Electrical Tasks
- 3.2 Instruments and Equipment Used

- **PRACTICAL KNOWLEDGE GAINED**

- 4.1 Technical Skills Acquired

- **SUMMARY, CONCLUSION, AND RECOMMENDATIONS**

- 5.1 Comprehensive Summary of Activities
- 5.2 Challenges Encountered and Solution

- 5.3 Detailed Suggestions for Improvement
- 5.4 Conclusion

5.5 Recommendations

CHAPTER ONE: INTRODUCTION

The Student Industrial Work Experience Scheme (SIWES) is a transformative program initiated by the Federal Government of Nigeria to immerse tertiary institution students in practical industrial environments, thereby enriching their theoretical education with real-world applications. This report encapsulates my intensive four-month industrial training at Yemi Etadnam Enterprises Limited, located at Peller Road, Opposite S.B. Hammed Street, Iseyin, Oyo State, spanning from August to November 2024. As a dedicated student of Electrical/Electronics Engineering Technology at Kwara State Polytechnic, Ilorin, this training provided me with an unparalleled opportunity to delve deeply into the realm of electrical engineering.

My tenure at Yemi Etadnam Enterprises Limited was marked by extensive engagement in electrical installations, including single-phase wiring for residential buildings, meticulous installation of electrical components such as circuit breakers and distribution boards, and rigorous troubleshooting of complex electrical faults. This report aims to chronicle my objectives, document the breadth of my work experiences, analyze the challenges I encountered, and reflect on the profound lessons learned, illustrating how this industrial exposure has fortified my technical prowess and professional readiness for a career in electrical engineering.

1.1 BACKGROUND

SIWES was instituted in 1973 by the Industrial Training Fund (ITF) as a strategic response to the need for practical training among students in technical and science-related disciplines. The program mandates a structured period of supervised industrial attachment, typically ranging from three to six months, to ensure students acquire hands-on skills that complement their academic coursework.

1.2 OBJECTIVES

The objectives of my SIWES training were multifaceted and carefully aligned with both my academic goals and career aspirations:

- To acquire in-depth practical skills in electrical wiring, installation techniques, and system maintenance.
 - To gain a comprehensive understanding of the operational framework and service delivery mechanisms of a small-scale electrical firm.
 - To develop advanced troubleshooting methodologies for diagnosing and resolving electrical faults in diverse systems.
 - To enhance my professional competencies, including teamwork, effective communication with clients and colleagues, and adherence to stringent safety protocols in an industrial setting.
-

CHAPTER TWO: DESCRIPTION OF THE ESTABLISHMENT

2.1 LOCATION AND BRIEF HISTORY

Yemi Etadnam Enterprises Limited is strategically positioned at Peller Road, Opposite S.B. Hammed Street, Iseyin, Oyo State, within a vibrant commercial district renowned for its accessibility and bustling economic activity. This advantageous location ensures that the firm is well-placed to serve a diverse clientele, including homeowners, small business owners, and local contractors

seeking reliable electrical services. Founded over a decade ago, Yemi Etadnam Enterprises Limited began as a modest repair workshop ,The firm has established itself as a trusted name in Iseyin, specializing in electrical installations, system maintenance, and minor electrical repairs, catering to the growing demand for dependable electrical solutions in the region.

The company's growth trajectory reflects its commitment to quality service and customer satisfaction, evolving from a small-scale operation into a recognized service provider. Its history is marked by a dedication to adopting practical techniques and maintaining high standards, making it an ideal training ground for students like myself seeking to develop hands-on expertise in electrical engineering.

2.2 OBJECTIVES OF THE ESTABLISHMENT

Yemi Etadnam Enterprises Limited operates with a clear set of objectives that guide its daily activities and long-term vision:

- **Quality Service Delivery:** To provide reliable, efficient, and durable electrical installations and repairs that meet industry standards and client expectations.

- **Customer Satisfaction:** To address client requirements promptly and professionally, fostering trust and ensuring repeat patronage through exceptional service.
- **Skill Development:** To serve as a training hub for apprentices and interns, imparting practical electrical engineering skills that contribute to their professional growth.
- **Business Growth:** To expand its service offerings, enhance its technical capabilities, and maintain a competitive edge within the local market of Iseyin and surrounding areas.

2.3 ORGANIZATION STRUCTURE

The organizational structure of Yemi Etadnam Enterprises Limited is deliberately simple and flat, designed to facilitate efficient workflow and direct communication:

- **Technicians:** A team of skilled workers who execute the core electrical tasks, including installations, repairs, and client interactions, bringing technical expertise to every project.

- **Apprentices/Interns:** Entry-level participants, including myself, who assist technicians, learn practical skills, and perform supportive tasks under close supervision, contributing to the firm's operations while gaining valuable experience.

This streamlined structure fosters a collaborative environment where knowledge transfer is seamless, and interns like me can actively participate in hands-on tasks while receiving guidance from experienced professionals.

2.4 DEPARTMENTS AND THEIR FUNCTIONS

Although Yemi Etadnam Enterprises Limited is a small firm, its operations are functionally divided into distinct units to ensure efficiency:

- **Electrical Installation Unit:** This unit is the backbone of the firm, responsible for designing and implementing electrical wiring systems, installing components such as switches, sockets, and circuit breakers, and ensuring proper functionality in residential and small commercial settings.
- **Maintenance Unit:** Dedicated to diagnosing and repairing electrical faults, this unit handles troubleshooting, system upgrades, and preventive maintenance to sustain the reliability of installed systems.

- **Customer Service:** A critical interface with clients, this unit manages inquiries, schedules job appointments, collects feedback, and ensures clear communication between the firm and its customers, enhancing service delivery and client relations.
-

CHAPTER THREE: WORK EXPERIENCE AND ACTIVITIES

During my four-month tenure at Yemi Etadnam Enterprises Limited from August to November 2024, I immersed myself in an extensive array of electrical engineering tasks. My training was designed to maximize hands-on participation, allowing me to develop a profound understanding of electrical systems and their practical applications. Below is a thorough account of my work experience, structured to reflect the depth and breadth of my involvement.

3.1 DETAILED DESCRIPTION OF ELECTRICAL TASKS

Key Roles and Responsibilities

- **Electrical Wiring and Installations:** Actively participated in wiring residential buildings, ensuring proper layout and connection of electrical circuits to power lighting, appliances, and other systems.

- **Component Installation:** Installed and tested a wide range of electrical fittings, including switches, sockets, circuit breakers, and distribution boards, ensuring compliance with safety and operational standards.
- **Fault Diagnosis and Repair:** Conducted detailed troubleshooting of electrical systems to identify and rectify faults such as short circuits, overloads, and power outages, restoring functionality efficiently.
- **Documentation:** Maintained a meticulous record of daily activities, observations, and technical details in my SIWES logbook, ensuring accurate tracking of my progress and experiences.
- **Customer Interaction:** Engaged with clients to explain installation processes, provide safety advice, and address concerns, enhancing their understanding and satisfaction with the services provided.

Daily and Weekly Tasks

- **Electrical Wiring:** My primary daily task involved wiring residential buildings, a process that required careful planning and execution. I measured and cut cables to precise lengths, stripped insulation, and connected wires to terminals using crimping tools and screwdrivers. For instance, I worked on a two-bedroom apartment project where I installed a single-phase wiring

system, running cables through conduit pipes to conceal and protect them from environmental damage. This task included setting up ring circuits for sockets and radial circuits for lighting, ensuring even distribution of electrical load. I used 1.5 mm² cables for lighting circuits (rated for 6A) and 2.5 mm² cables for socket circuits (rated for 13A), adhering to standard load calculations to prevent overheating.

- **Component Installation:** I installed various electrical components daily, such as single-pole switches for lighting control, 13A sockets for appliance connections, and miniature circuit breakers (MCBs) rated at 16A and 32A to protect circuits from overloads. On a weekly basis, I assisted in mounting distribution boards, connecting them to the main power supply, and labeling circuits for easy identification. During a renovation project, I installed a 4-way distribution board, integrating an earth leakage circuit breaker (ELCB) with a sensitivity of 30mA to enhance safety by detecting ground faults. I ensured proper busbar connections and used a torque screwdriver to secure terminals at 2 Nm, preventing loose contacts.
- **Troubleshooting and Repairs:** I conducted fault diagnosis on malfunctioning electrical systems, a task that demanded keen observation and technical precision. Using a multimeter, I tested for continuity, voltage drops, and

insulation resistance. A notable instance involved diagnosing a power outage in a client's home caused by a short circuit in a concealed junction box. I traced the fault by sectionalizing the circuit, identified melted insulation due to overloading, replaced the damaged 2.5 mm² wiring with new PVC-insulated cable, and reinforced the connections with terminal blocks to prevent recurrence. Weekly, I inspected existing installations for wear and tear, tightening loose connections (e.g., at 1.5 Nm torque) and replacing faulty components like burnt-out 10A fuses with ceramic alternatives for durability.

- **Testing and Verification:** After completing installations, I performed rigorous testing to ensure system integrity. This included using an insulation tester (Megger) to measure resistance between live and neutral wires, ensuring values exceeded 1 MΩ at 500V DC to confirm safe insulation. I also used a test lamp to verify live circuits (observing a 220V glow) and conducted polarity checks with a multimeter to ensure correct wiring orientation (live to switch, neutral to load). These tests were critical to certifying installations as safe and operational, a process I repeated weekly on major projects, documenting results like a consistent 2 MΩ insulation reading for a three-room installation.

- **Maintenance Activities:** Weekly, I dedicated time to maintaining workshop tools and equipment, cleaning multimeters with a dry cloth to remove dust, lubricating pliers with machine oil to prevent rust, and checking the calibration of insulation testers against a known resistance source. I also assisted in organizing the storage of cables (sorted by size: 1.5 mm², 2.5 mm², 4 mm²), connectors (e.g., 10A terminal blocks), and spare parts (e.g., 16A MCBs), ensuring a tidy and efficient workspace that minimized delays during tasks.

3.2 INSTRUMENTS AND EQUIPMENT USED

The following tools and equipment were integral to my training at Yemi Etadnam Enterprises Limited, each serving a specific purpose in electrical tasks:

- **Multimeter:** A versatile device used daily to measure voltage (e.g., 220–240V AC in domestic circuits), current (e.g., load currents up to 10A), and resistance (e.g., continuity checks yielding <1 Ω for intact wires). I relied on it to diagnose faults (e.g., a 50V drop indicating a loose connection) and verify circuit functionality.
- **Insulation Tester (Megger):** Employed to test insulation resistance in wiring systems, ensuring values met safety standards (typically >1 MΩ at 500V).

DC). I used it weekly to certify installations, achieving readings like 2.5 MΩ for a newly wired house, confirming no leakage currents.

- **Wire Strippers:** Used to remove insulation from cables (e.g., 1.5 mm² and 2.5 mm² PVC-insulated wires) without damaging the copper conductors, ensuring clean connections. I adjusted the stripper gauge to match cable sizes for precision.
- **Pliers (Needle-Nose and Cutting):** Facilitated bending wires into loops for terminal connections (e.g., 5 mm loops for switch terminals) and cutting excess lengths during wiring tasks, ensuring neatness and reliability.
- **Screwdrivers (Flathead and Phillips):** Essential for securing switches, sockets, and circuit breakers to mounting boxes and panels, with sizes ranging from 3 mm to 6 mm tips. I used a 4 mm Phillips to fasten MCBs at 2 Nm torque.
- **Cable Cutters:** Heavy-duty cutters used to trim cables to precise lengths, such as 4 mm² cables for main supply lines (cut to 3-meter sections for distribution boards), ensuring efficient installations without waste.
- **Test Lamp:** A simple yet effective tool for confirming the presence of voltage in live circuits, used during troubleshooting to identify energized wires (e.g., glowing at 220V AC).

- **Personal Protective Equipment (PPE):** Included insulated gloves (rated for 1000V), safety goggles (anti-fog), steel-toe boots (impact-resistant), and helmets (hard hats), worn consistently to protect against electrical shocks, falling debris, and other hazards during fieldwork.

3.3 SAFETY PROTOCOLS OBSERVED

Safety was paramount throughout my training at Yemi Etadnam Enterprises Limited, and I adhered to rigorous protocols:

- **Use of PPE:** Wore insulated gloves and goggles when handling live wires (e.g., during polarity checks), and helmets during outdoor installations (e.g., mounting external sockets) to mitigate risks of shocks and injuries.
- **Power Isolation:** Ensured circuits were de-energized by switching off mains at the distribution board and verifying with a test lamp (no glow indicating isolation) before commencing repairs or installations, preventing accidental energization.
- **Proper Tool Handling:** Used insulated tools (e.g., rubber-handled screwdrivers) and checked them for cracks or exposed metal before use to avoid shocks, storing them in a dry toolbox post-task.

- **Worksite Organization:** Kept work areas free of clutter by coiling excess cables and removing debris, avoiding tripping hazards, and ensured tools were returned to designated spots after use.
 - **Team Coordination:** Communicated clearly with technicians during group tasks, such as lifting a 15 kg distribution board, using verbal cues like “lift on three” to ensure synchronized and safe execution.
-

CHAPTER FOUR: PRACTICAL KNOWLEDGE GAINED

The SIWES training at Yemi Etadnam Enterprises Limited provided me with an extensive repertoire of technical and professional skills, profoundly enhancing my capabilities as an electrical engineering student. Below is a detailed breakdown of the knowledge I acquired:

4.1 TECHNICAL SKILLS ACQUIRED

- **Electrical Wiring Proficiency:** Mastered the art of single-phase wiring, including the design and implementation of ring and radial circuits. I learned to calculate cable sizes (e.g., 1.5 mm² for lighting at 6A, 2.5 mm² for sockets at 13A) based on load requirements using the formula $I = P/V$ or $P = VI$.

(where II is current, PP is power, and VV is voltage), and to install PVC conduit systems (20 mm diameter) for cable protection, adhering to Nigerian wiring regulations (e.g., IEE standards). For a three-room house, I wired a 720W lighting load across two circuits, ensuring each carried less than 6A.

- **Installation Techniques:** Gained expertise in mounting electrical components with precision. I installed MCBs (e.g., 16A for sockets) in a 4-way distribution board, connecting them to a copper busbar with 4 mm² cables, and integrated an ELCB (30mA sensitivity) using a 4 mm² green-yellow earthing wire to the grounding rod (resistance <1 Ω). I learned to torque terminals at 2 Nm to prevent arcing, a critical skill for system reliability.
- **Advanced Troubleshooting:** Developed a systematic approach to diagnosing electrical faults, using multimeters to measure voltage drops (e.g., identifying a 50V drop due to a loose terminal) and insulation testers to detect leakage currents (e.g., a 0.5 MΩ reading indicating damp insulation). I mastered techniques like sectionalizing circuits with a junction box to isolate a short circuit, replacing a 2.5 mm² burnt cable with a 15-meter section, and testing post-repair to confirm 230V stability.

- **Tool Mastery:** Became proficient with a range of electrical tools, understanding their specific applications—e.g., using a Megger at 500V DC to test insulation (achieving 2 MΩ) versus a multimeter for live readings (e.g., 238V AC at a socket). I calibrated tools weekly, ensuring accuracy within $\pm 5\%$ tolerance, enhancing my technical versatility.
- **System Testing and Verification:** Learned to perform comprehensive tests, such as polarity checks with a multimeter (live to switch yielding 230V, neutral to load at 0V), and insulation resistance tests to confirm system safety (e.g., 2.5 MΩ across a 20-meter circuit). I documented results meticulously, ensuring compliance with safety thresholds (e.g., >1 MΩ per IEE regulations).

4.2 PROFESSIONAL SKILLS DEVELOPED

- **Problem-Solving Acumen:** Tackled real-world electrical challenges, such as resolving a persistent tripping breaker by identifying an overloaded 16A circuit (drawing 20A from multiple appliances). I redistributed the load across two 10A MCBs, sharpening my analytical and decision-making skills through practical application.

- **Teamwork and Collaboration:** Worked seamlessly with technicians on large-scale installations, such as wiring a three-bedroom house over two weeks, coordinating tasks like pulling 30 meters of 2.5 mm² cable through conduits and mounting a 10 kg distribution board, meeting deadlines through effective division of labor.
- **Communication Skills:** Effectively explained technical processes to clients, such as the necessity of an ELCB to prevent shocks (demonstrating a 30mA trip with a tester), using analogies like “a safety gate for electricity” to bridge engineering concepts and layperson understanding, enhancing client trust and satisfaction.
- **Safety Consciousness:** Internalized the critical importance of safety protocols, such as double-checking circuit isolation with a test lamp (no glow confirming 0V) before repairs, instilling a disciplined approach to risk management that will guide my future practice in high-voltage environments.
- **Time Management:** Balanced multiple tasks daily—wiring a room (4 hours), testing circuits (1 hour), and documenting in my logbook (30 minutes)—learning to prioritize urgent repairs (e.g., a client’s power

outage) while maintaining steady progress on installations, a skill vital for professional efficiency.

CHAPTER FIVE: SUMMARY, CONCLUSION, AND RECOMMENDATIONS

5.1 COMPREHENSIVE SUMMARY OF ACTIVITIES

My SIWES training at Yemi Etadnam Enterprises Limited from August to November 2024 was an immersive and transformative journey into the practical world of electrical engineering. I engaged in an extensive range of electrical tasks that tested and expanded my capabilities. Daily, I wired residential buildings, meticulously connecting circuits through conduit pipes and installing components like switches, sockets, and circuit breakers. For instance, I completed the wiring of a two-bedroom apartment over five days, integrating a 6A MCB for a 360W lighting load and a 16A MCB for a 2 kW socket load, ensuring balanced distribution with a total cable run of 25 meters.

Weekly, I troubleshooted faults, such as a short circuit in a client's kitchen circuit caused by water ingress into a junction box, which I resolved by replacing 3 meters

of damaged 2.5 mm² wiring, sealing the box with silicone, and verifying 230V post-repair. Testing was a routine task, where I used insulation testers to verify system integrity (e.g., 2.5 MΩ for a three-room setup) and multimeters to confirm voltage stability (e.g., 238V at a newly installed socket). Maintenance activities included inspecting tools for wear (e.g., checking plier springs), lubricating them with oil, and organizing cable inventories (e.g., 50 meters of 1.5 mm² stock), ensuring operational readiness. This hands-on experience not only reinforced my theoretical knowledge but also cultivated a deep appreciation for the precision and diligence required in electrical engineering practice.

5.2 CHALLENGES ENCOUNTERED AND SOLUTIONS

My training at Yemi Etadnam Enterprises Limited was not without challenges, each of which provided valuable learning opportunities:

- **Limited Tools:** The workshop occasionally lacked sufficient multimeters or insulation testers, slowing down fault diagnosis on large projects like a five-room installation. **Solution:** I adapted by using a single multimeter judiciously, prioritizing voltage checks (e.g., 230V at mains), and collaborated with technicians to share tools efficiently, completing tasks within an extra hour.

- **Power Interruptions:** Frequent outages disrupted testing and installation tasks, such as verifying a 4-way distribution board, delaying certification by up to two hours. **Solution:** I scheduled testing during periods of stable supply (e.g., early mornings) and used a client-provided 2 kVA generator on-site, ensuring continuity by powering a 500W test load.
- **Weather Conditions:** Heavy rains and intense heat posed difficulties during outdoor installations, such as wiring a client's patio, where wet conditions risked shocks and heat caused fatigue. **Solution:** I wore waterproof PPE (e.g., 1000V gloves) during rain, paused work during peak downpours, and used shaded areas with a handheld fan during heat, coordinating with my team to adjust schedules (e.g., 7 AM starts).
- **Material Delays:** Clients occasionally delayed providing cables or fittings (e.g., a 2-day wait for 4 mm² cable), stalling a three-room wiring project. **Solution:** I communicated proactively with clients via phone to expedite deliveries and sourced 10 meters of 2.5 mm² cable from workshop stock as a temporary substitute, completing critical sections on time.
- **Customer Expectations:** Some clients demanded rapid fixes for complex faults, such as a tripped 16A breaker due to an overloaded circuit (20A draw). **Solution:** I explained the overload issue patiently, demonstrating a

5A excess with a multimeter, and proposed splitting the load across two 10A MCBs, gaining their approval after a 15-minute discussion and resolving the issue in two hours.

5.4 CONCLUSION

The SIWES training at Yemi Etadnam Enterprises Limited was an exceptionally enriching and eye-opening experience that cemented my passion for electrical engineering. Through extensive engagement in wiring, installing components, and troubleshooting electrical systems, I acquired practical skills that seamlessly complemented my academic foundation at Kwara State Polytechnic. The challenges I navigated—ranging from tool shortages to environmental constraints—honed my resilience, adaptability, and problem-solving capabilities, while the hands-on tasks instilled a profound respect for safety and precision in engineering practice.

This four-month journey bridged the gap between theoretical concepts and their real-world applications, equipping me with the technical expertise, teamwork abilities, and professional demeanor essential for a successful career in electrical engineering.
